HABITAT FOR HUMANITY - CLALLAM

Sequim, WA

TRAFFIC IMPACT ANALYSIS (TIA)

September 20, 2023



HEATH & ASSOCIATES

Transportation Planning & Engineering

HABITAT FOR HUMANITY - CLALLAM TRAFFIC IMPACT ANALYSIS

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HABITAT FOR HUMANITY - CLALLAM
TRAFFIC IMPACT ANALYSIS

CONTENTS

1. Introduction 4
2. Project Description 4
3. Existing Conditions 6
4. Forecast Traffic Demand & Analysis 11
5. Conclusions & Mitigation 20

TABLES

1. Roadway Network 6
2. Bus Routes 6
3. Transportation Improvement Projects 9
4. Existing Weekday PM Peak Hour Level of Service 10
5. Project Trip Generation 11
6. Forecast 2028 Weekday PM Peak Hour Level of Service 17

FIGURES

1. Vicinity Map & Roadway System 4
2. Conceptual Site Plan 5
3. Existing PM Peak Hour Volumes 8
4. PM Peak Hour Trip Distribution & Assignment 13
5. PM Peak Hour Pipeline Volumes 14
6. Forecast 2028 PM Peak Hour Background Volumes 15
7. Forecast 2028 PM Peak Hour Volumes with Project 16
8. E Brownfield Road Access Sight Distance Exhibit 19

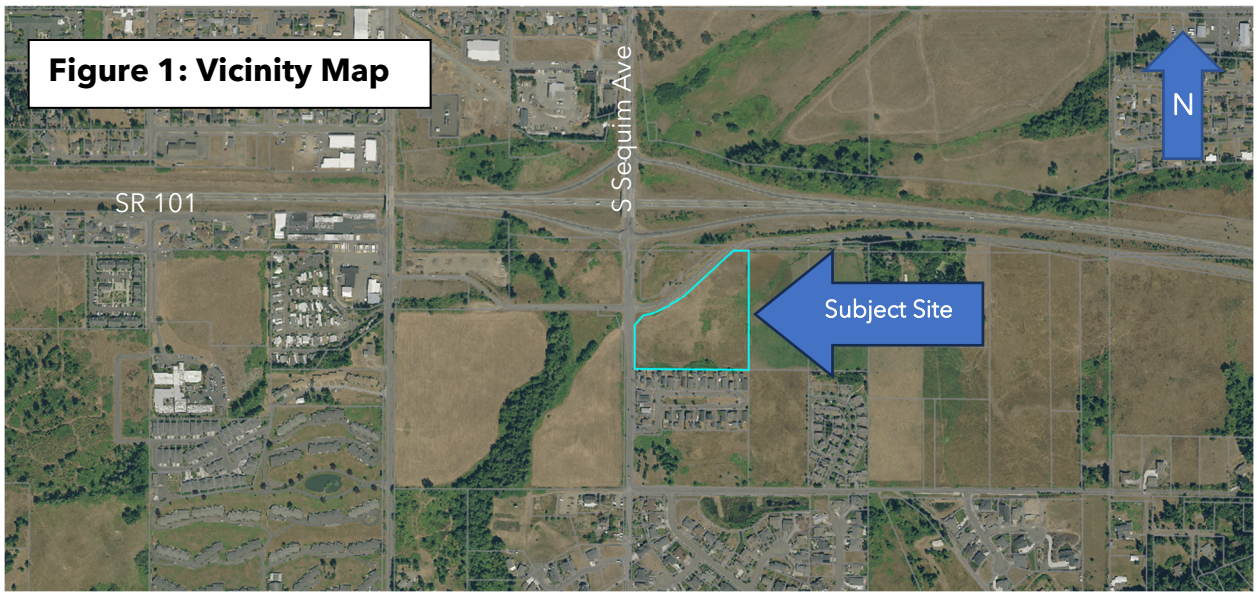
HABITAT FOR HUMANITY - CLALLAM
TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

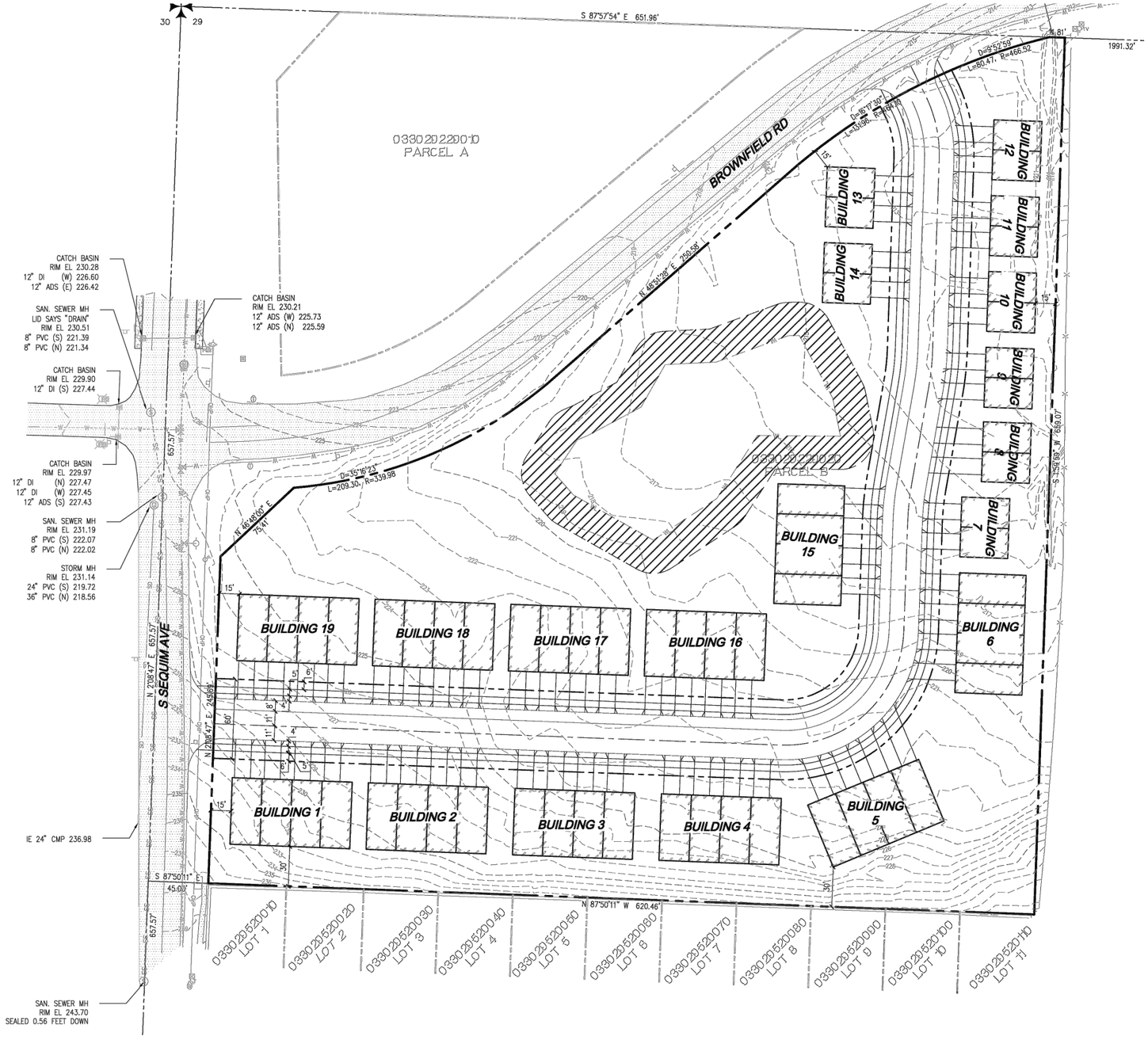
The main goals of this study focus on the assessment of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent street system and baseline vehicular volumes. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined if needed.

2. PROJECT DESCRIPTION

Habitat for Humanity - Clallam proposes for the construction of 44 townhomes and 8 duplexes (16 units) totaling 60 new residential dwelling units in the city of Sequim. All proposed dwelling units are proposed as affordable housing, intended for households in the 30-80% Average Median Income (AMI) range. The proposed development comprises undeveloped, 6.66-acre tax parcel #: 033029229020. The subject site is bordered to the west by S Sequim Avenue and to the north by E Brownfield Road. Access is proposed via one roadway extending east from S Sequim Avenue and one roadway extending south from E Brownfield Road. Surrounding development is primarily residential or undeveloped and SR 101 is located just north of the subject site. A vicinity map is provided on the following page in Figure 1 with the subject site highlighted in teal. A conceptual site plan is presented in Figure 2.



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CONCEPTUAL SITE PLAN
FIGURE 2

3. EXISTING CONDITIONS

3.1 Existing Street System

The street network serving the proposed project consists of a variety of roadways. The major roadways and arterials defined in the study area are listed and described below.

Table 1: Roadway Network

Functional Classification	Roadway	Speed Limit	Lanes	Street Parking	Sidewalk	Bike Facilities
State Route	SR 101	55-mph	2	No	No	No
Collector	S Sequim Ave	25-30 mph	2	No	n/o Brownfield Rd	
	Brownfield Rd	25-35 mph	2	No	No	~200' e/o Sequim Ave

3.2 Transit Service

A review of the Clallam Transit and Jefferson Transit regional bus schedules indicates that transit service is provided near the site. Table 2 below provides further route details.

Table 2: Bus Routes

Route	Description	Weekday Service	Saturday	Sunday	Nearest Stop
8	Sequim: Sequim TC to Haines Place P & R (Port Townsend)	6:11 AM – 7:23 PM (every ~2-4 hours)	7:00 AM – 6:36 PM (every ~10 hours)	N/A	~0.7-miles
30	101 Commuter: Gateway TC to Sequim TC	5:30 AM – 10:05 PM (every ~30 min.)	7:25 AM – 8:30 PM (every ~30-60 min.)	N/A	~0.7-miles
50	Jamestown: Sequim TC to JTC	7:40 AM – 5:20 PM (every ~2-4 hours)	N/A	N/A	~0.7-miles
52	Diamond Point: Sequim TC to Veach Rd	6:40 AM – 6:20 PM (every 5-6 hours)	N/A	N/A	~0.7-miles
123	Straight Shot: Gateway TC to Bainbridge Ferry Terminal	7:25 AM – 10:05 PM (every 5-6 hours)	7:25 AM – 8:59 PM (every 5-6 hours)	8:05 AM – 8:10 PM (every 7 hours)	~0.7-miles

It should be noted that all nearest stops outlined above at located at the Sequim Transit Center, ~0.7-miles northwest walking-distance from the subject site. Complete sidewalks from E Brownfield to/from the Transit Center are available. Refer to the Clallam Transit and Jefferson Transit service schedules for more information.

3.3 Existing Peak Hour Volumes

Field data for this study was collected by our firm in August of 2023. The following intersections were included in analysis:

1. S Sequim Ave & SR 101 Westbound Ramps
2. S Sequim Ave & SR 101 Eastbound Ramp
3. S Sequim Ave & E Brownfield Rd

Counts were performed between the PM peak period of 1:00 PM - 5:00 PM. The single hour exhibiting highest overall intersection volumes is then derived (peak hour) and is used for analysis for each respective location. Figure 3 on the following page identifies existing PM peak hour volumes. Full count sheets have been attached in the appendix for reference for respective intersection peak hours and volumes.

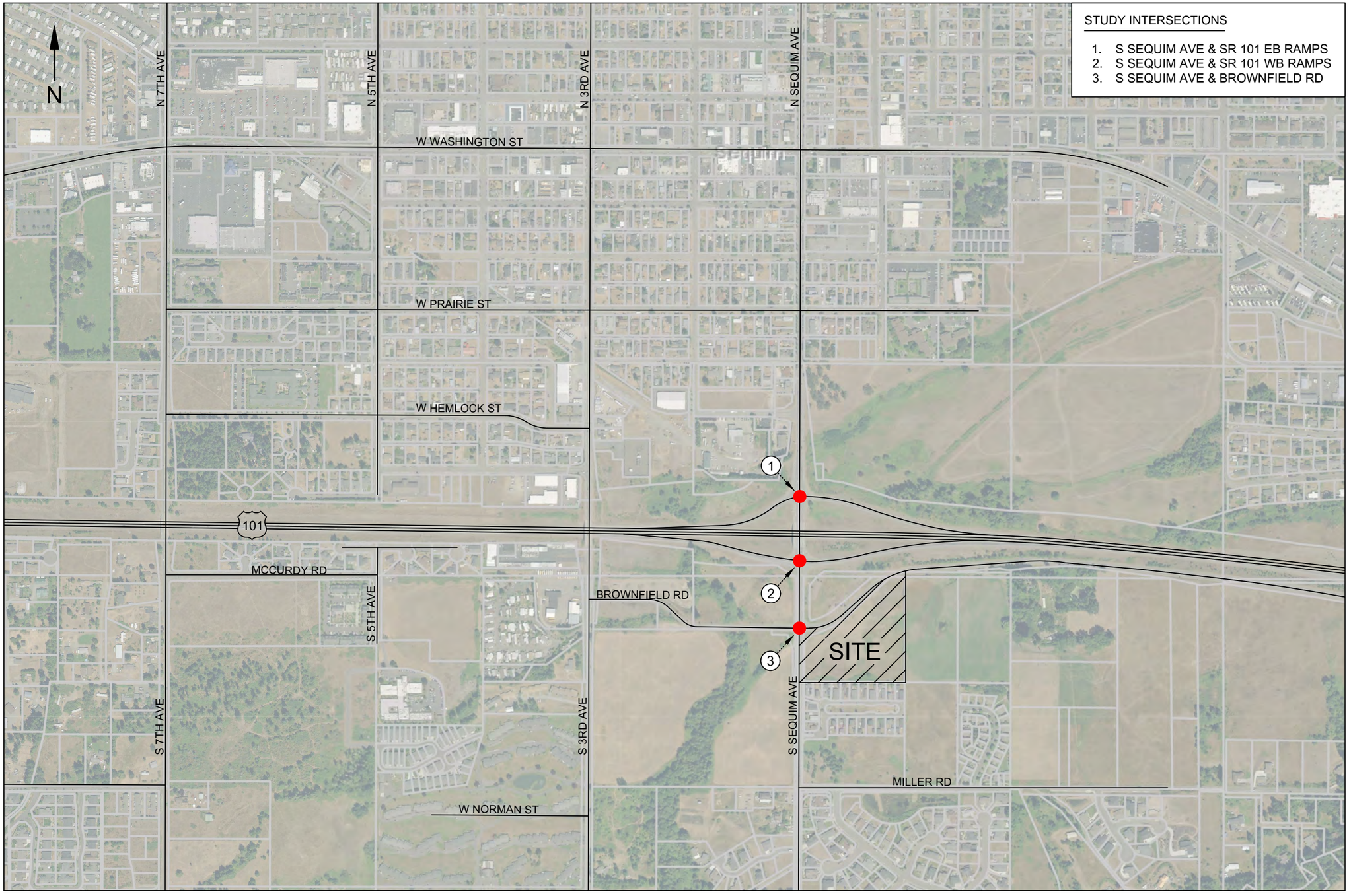
3.4 Non-Motorist Infrastructure

Non-motorist volumes were observed at the study intersection nearest the subject site, S Sequim Avenue & Brownfield Road, during routine peak hour movement counts. No pedestrians and one bicyclist were observed at the study intersection during the PM peak hour.

Sidewalk and bike lanes are available on S Sequim Avenue north of Brownfield Road. A detached walking path is available along the east side of S Sequim Avenue south of the subject site to Alpine Loop. Moreover, bike lanes are available on Brownfield Road east of S Sequim Ave. The City has planned non-motorist infrastructure infill that would further improve pedestrian conditions along S Sequim Avenue, Washington Street, S 7th Avenue, S 3rd Avenue and other nearby corridors. Sidewalks are to be constructed along the roadway internal to the subject site and the frontage.

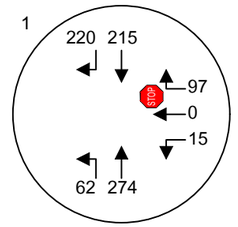
School-aged children residing in the site may attend Helen Haller Elementary School and Sequim Middle/High Schools – both located in excess of 1.0-mile walking-distance from the subject site. In review of the Sequim School District bus routes for the 2023-2024 school year, school-aged children would likely utilize bus service to and from school. One existing bus stop is located ~425-feet walking-distance south of the S Sequim Avenue site access at Alpine Loop which may meet the needs of the Habitat site (to be verified with city).

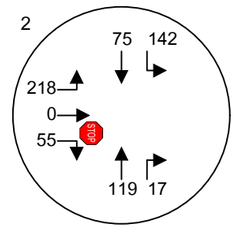
Overall, any required frontage or street improvements to S Sequim Avenue and E Brownfield Road should be coordinated with the City.

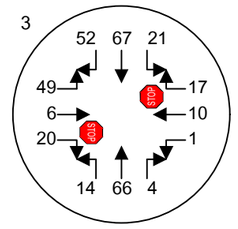


STUDY INTERSECTIONS

1. S SEQUIM AVE & SR 101 EB RAMPS
2. S SEQUIM AVE & SR 101 WB RAMPS
3. S SEQUIM AVE & BROWNFIELD RD







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EXISTING PM PEAK HOUR VOLUMES
FIGURE 3

3.5 Roadway Improvements

The most recently available City of Sequim 2023-2028 Transportation Improvement Program was reviewed. Several improvement projects are planned in the vicinity of the subject site, which are summarized in Table 3 below.

Table 3: Transportation Improvement Projects

Name	Location	Improvement	Cost
Pavement Rehab. (#2)	N Sequim Ave	Rehab pavement and improve ADA accessibility	$1,000,000
Pavement Rehab. (#3)	Washington St: River Rd to Simdars Rd	Rehab pavement and improve ADA and ped. accessibility and mobility	$6,398,000
S 7th Improvement (#8)	Comfort to McCurdy	Improve roadway	$3,472,000
S Sequim Ave Complete Street (#9)	Corridor	Create safe and encouraging multi-modal transportation options	$3,690,000
W Washington from River Rd Modification (#11)	Corridor	Eastbound Auxiliary Lane modification	$100,000
S 5th Ave Ext. (#13)	McCurdy Rd to Driveway	Construct a southerly roadway extension from McCurdy to Driveway	$150,000
N Sequim Ave Sidewalk & Bike Lanes (#18)	Corridor	Construct bicycle facilities and sidewalk	$2,150,000
E and E Washington St Bicycle Facilities (#22)	Sequim to Simdars Rd; Priest Rd to 5th Ave	Construct bicycle facilities	$240,000
N Sequim Ave Bicycle Facilities (#23)	Washington St to Fir St	Construct bicycle facilities	$30,000
S 3rd Ave Pedestrian Sidewalk/Pathways (#27)	Corridor	Construct pedestrian facilities	$300,000
Prairie St & S Sequim Ave (#31)	Intersection	Construct new signal	$375,000
US-101 Ramps & S Sequim Ave New Signals (#33)	US-101 Ramps & S Sequim Ave	*Construct new signals at the US-101 ramps on S Sequim Ave.	$705,000
W Wash. St & 2nd Ave (#35)	Intersection	Construct intersection improvement	$275,000
E Silberhorn Rd & S 7th Ave Improvements (#36)	Intersection	Intersection improvements, sidewalk, curb ramps, aligned lanes and traffic control	$500,000
E Washington St (#37)	Sequim to Rhodefer	E Washington St Bus Turn-outs	$149,000
S 7th Avenue new construction (#39)	McCurdy Rd to Reservoir Rd	Construct a new S 7th Ave roadway from McCurdy Rd to Reservoir Rd	$3,700,00
W Norman St New Construction (#40)	S 7th Ave to S 3rd Ave	Construct a W Norman St roadway from S 7th Ave to S 3rd Ave	$1,000,000
W Brownfield Rd Realignment (#41)	Sequim Ave to S 3rd Ave	Remove the roadway's curve, widen the roadway, adding sidewalks	$1,374,000
W Maple St Ext. (#42)	S 5th Ave to S 4th Ave	Roadway extension	$800,000
Wash. St Traffic Signals (#43)	Sequim to S 3rd Ave	Replace traffic signal with updated controllers	$550,000
S 5th Ave Int. & Traffic Signal Improvements (#44)	Corridor	Int. improvements; turn lane realignments/ additions; updated signal equipment	$811,000
S 7th Ave Int. & Traffic Signal Improvements (#45)	Corridor	Int. improvements; turn lane realignments/ additions; updated signal equipment	$770,000

*An Intersection Control Evaluation (ICE) was conducted by WSDOT for the S Sequim Avenue & SR 101 Ramp intersections (7/24/2023), which indicated that roundabouts are the preferred recommendation for the interchange improvements.

Moreover, WSDOT's Statewide Transportation Improvement Program (2023-2026) indicates that a project is planned at the US 101 & Sequim ramps. The project, *US 101/East Sequim Corridor Improvements (STIP ID: 310154S-5),* entails corridor and interchange improvements at the Sequim Avenue ramps. Preliminary engineering is currently underway, which has allocated approximately $1,090,000. The final improvement design and total construction cost are to be determined. As previously noted in the Table 2 footnote, an ICE was conducted for the S Sequim Avenue & SR 101 Ramp interchanges (7/24/2023) and submitted to WSDOT. The ICE's findings recommended roundabouts at both eastbound and westbound ramps. However, final costs, design, and timing are still unknown at this time.

3.6 Level of Service

Existing intersection delays were determined using the *Highway Capacity Manual 7*th Edition. Capacity analysis is used to establish level of service (LOS) which is a measure of congestion for transportation facilities. The range[1] for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating saturated conditions with heavy control delays. Level of service calculations were made using the *Synchro 12* analysis program. Side-street or two-way stop-controlled (TWSC) intersection LOS is determined by the approach with the highest delay. Table 4 presents existing PM peak hour LOS delays for the key intersections of study.

Table 4: Existing Weekday PM Peak Hour Level of Service

Delays given in seconds per vehicle

Ref. #	Intersection	Control	Movement	LOS	Delay
1	S Sequim Ave & SR 101 WB Ramps	Stop	WB	B	11.4
2	S Sequim Ave & SR 101 EB Ramps	Stop	EB	C	17.3
3	S Sequim Ave & Brownfield Rd	Stop	EB	B	10.9

[1] *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Stop Controlled Intersections – Level of Service

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Highway Capacity Manual, 7th Edition

The City of Sequim has an adopted level of service standard of LOS D or better[2]. As shown in Table 4, all study intersections are shown to operate with LOS C or better conditions, meeting City standards.

4. FORECAST TRAFFIC DEMAND & ANALYSIS

4.1 Project Trip Generation

Trip generation is defined as the number of vehicle movements that enter or exit the respective project site during a designated time period such as the PM peak hour or an entire day. The magnitude of the anticipated vehicle trip generation for the proposed project was derived from the Institute of Transportation Engineers (ITE) publication, *Trip Generation Manual, 11th Edition*. The selected land use for this project is Land Use Code (LUC) *215 – Single-Family Housing Attached* which accounts for both the proposed townhomes and duplexes. It should also be taken into consideration that all units will be income-restricted of at least 80% Average Median Income (AMI). However little affordable housing data are available within the *Trip Generation Manual*. Therefore, the trip generation estimates presented herein could be considered conservative.

Table 5 below summarizes the estimated project trip generation using ITE equations with dwelling units as the input variable. Included are the average weekday daily traffic (AWDT) and the AM and PM peak hours. Refer to the appendix for trip generation output.

Table 5: Project Trip Generation

Land Use	Size	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Single-Family Attached (LUC 215)	60 DU's	407	6	20	**26**	19	13	**32**

The project is estimated to generate 407 total average weekday daily trips with 26 total trips (6 inbound / 20 outbound) occurring in the AM peak hour and 32 total trips (19 inbound / 13 outbound) occurring in the PM peak hour.

[2] City of Sequim 2015-2035 Comprehensive Plan, Chapter 4 – Transportation

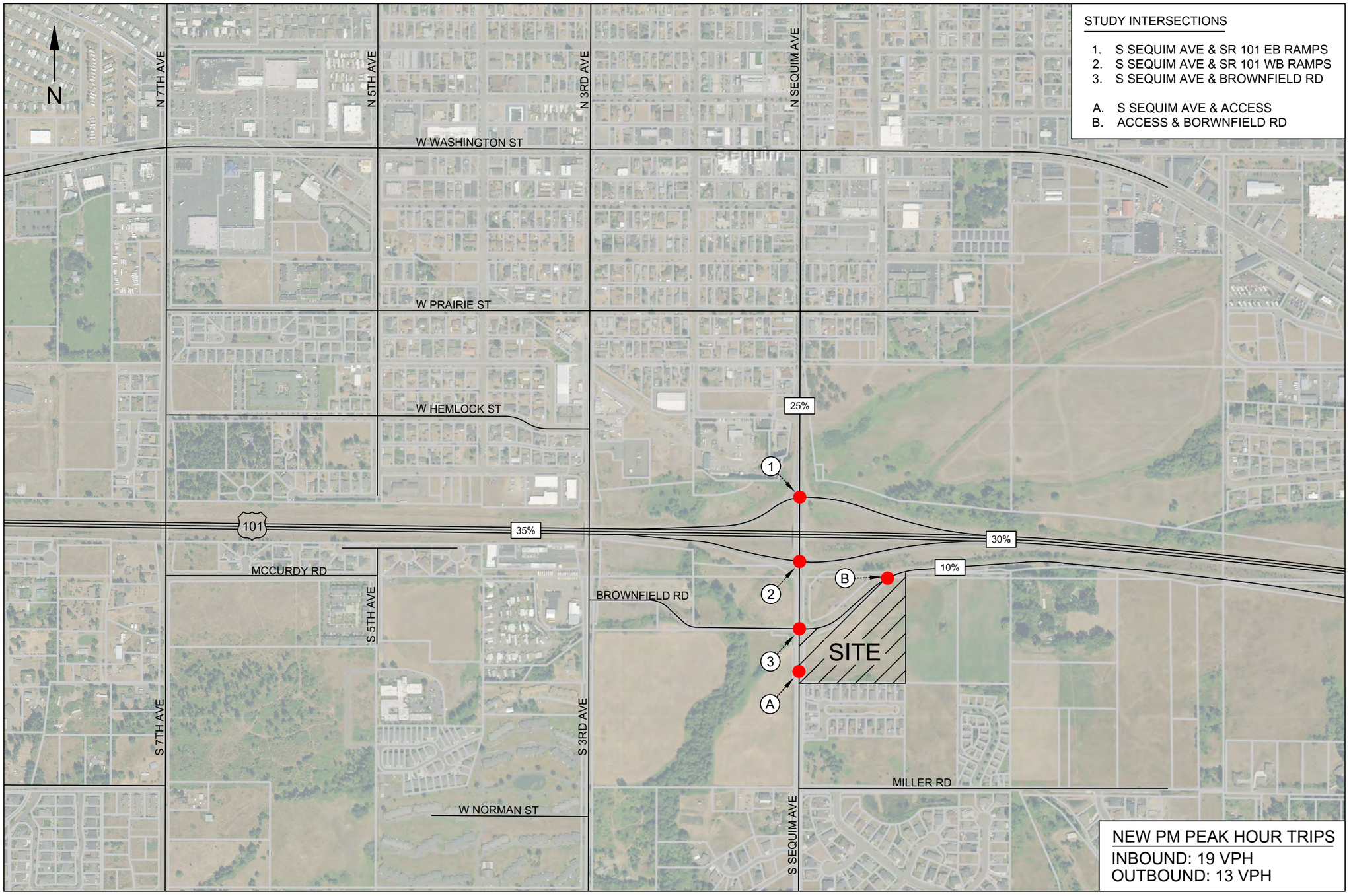
4.2 Distribution & Assignment

Trip distribution describes the anticipated travel routes for inbound and outbound project traffic during the peak hour study period. PM peak hour trips are primarily comprised of commuter-based (returning home) and recreational-based trips. Project-generated PM peak hour trips are expected to follow the general pattern as shown in Figure 4. Project-generated trips were disseminated between the proposed accesses on E Brownfield Road and S Sequim Avenue based on site layout. Outlying percentages emulate past projects in the vicinity of the subject site.

4.3 Future Peak Hour Volumes

A 5-year horizon of 2028 was used for future traffic delay analysis. Forecast 2028 background traffic volumes were derived by applying a 2.0 percent compound annual growth rate to the existing volumes of Figure 3. This growth rate was derived from the 2015-2035 City of Sequim Comprehensive Plan[3]. Moreover, pipeline volumes associated with the proposed McCurdy Plat, Rolling Hills, Effie Estates, Legacy Development and Home A/Home B projects were accounted for within forecast analysis. PM peak hour pipeline volumes are illustrated in Figure 5. Forecast 2028 PM peak hour volumes without and with the addition of project-generated traffic are shown in Figures 6 and 7, respectively.

[3] City of Sequim 2015-2035 Comprehensive Plan, Chapter 2 – Urban Growth

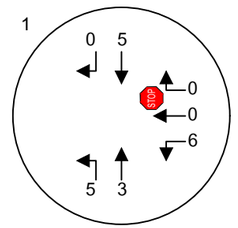


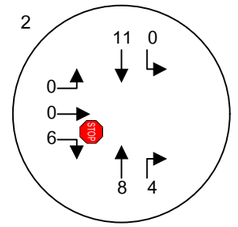
STUDY INTERSECTIONS

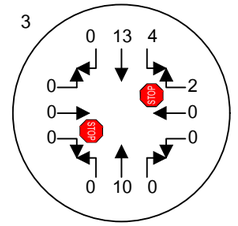
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2. S SEQUIM AVE & SR 101 WB RAMPS
3. S SEQUIM AVE & BROWNFIELD RD

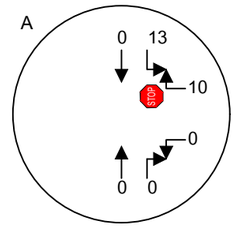
A. S SEQUIM AVE & ACCESS
B. ACCESS & BORWNFIELD RD

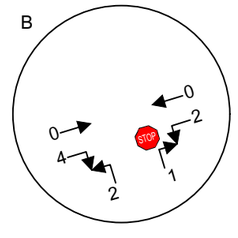
NEW PM PEAK HOUR TRIPS
INBOUND: 19 VPH
OUTBOUND: 13 VPH





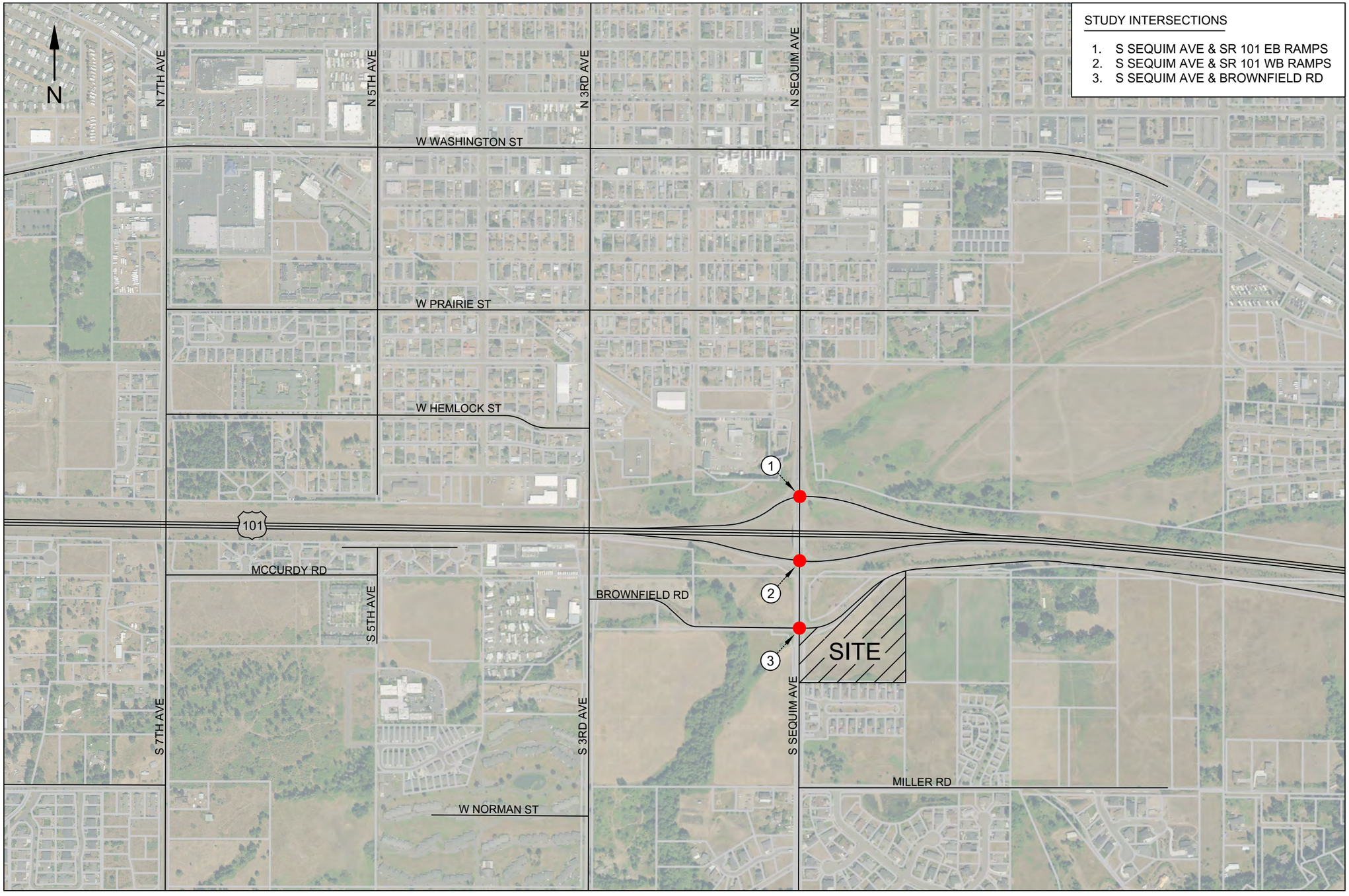






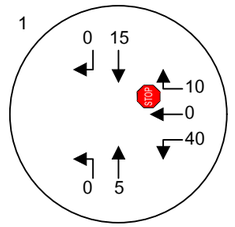
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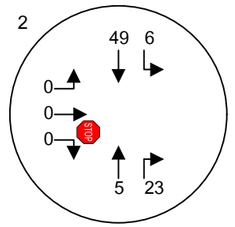
HABITAT FOR HUMANITY - CLALLAM
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 4

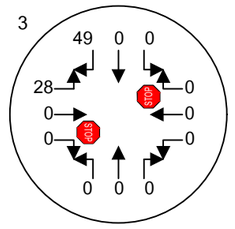


STUDY INTERSECTIONS

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2. S SEQUIM AVE & SR 101 WB RAMPS
3. S SEQUIM AVE & BROWNFIELD RD



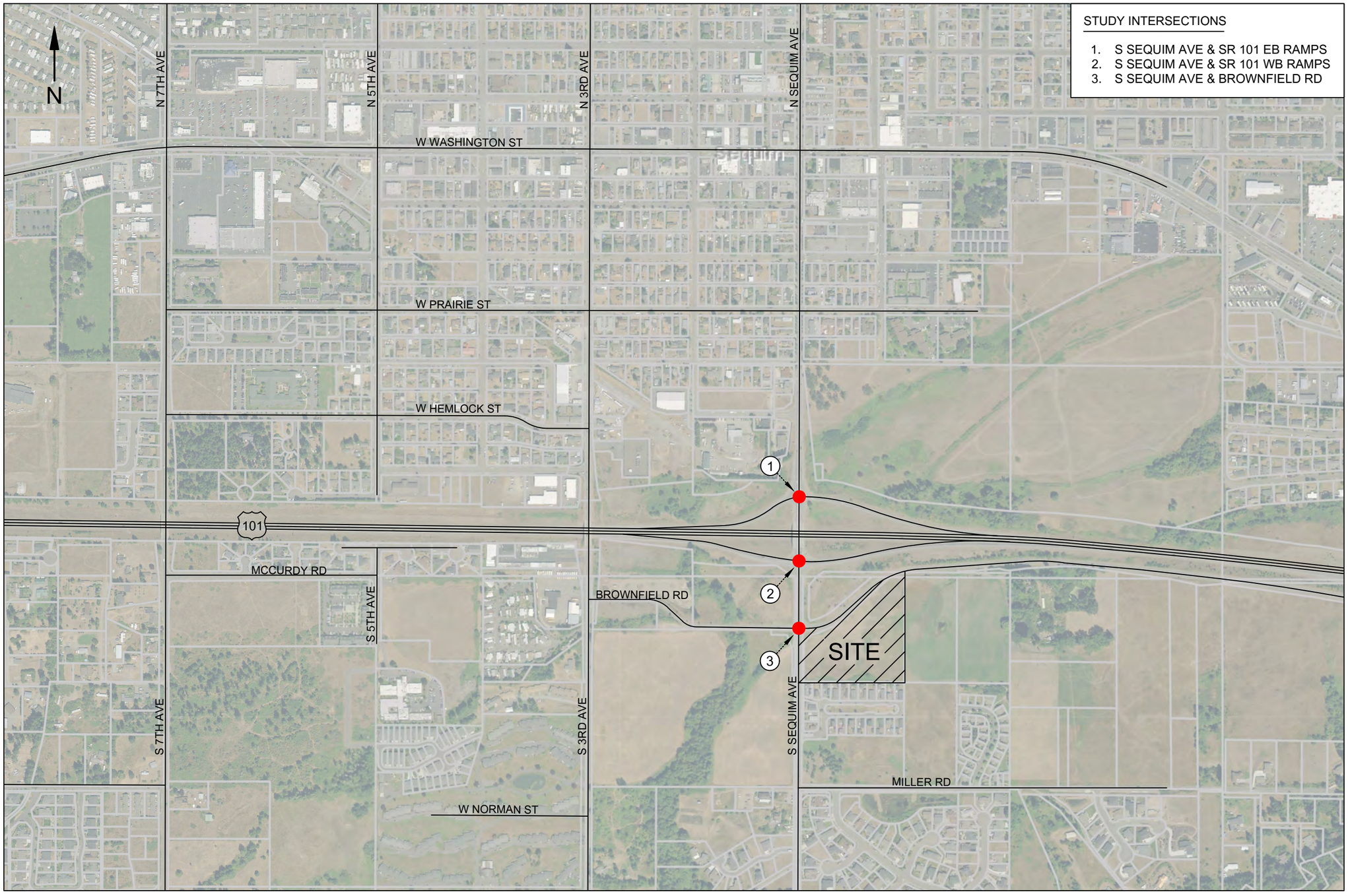




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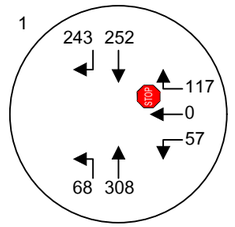
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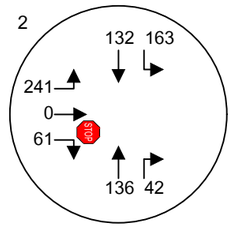
PM PEAK HOUR PIPELINE VOLUMES
FIGURE 5

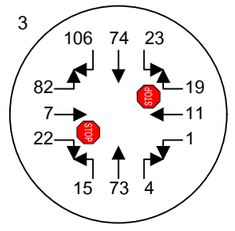


STUDY INTERSECTIONS

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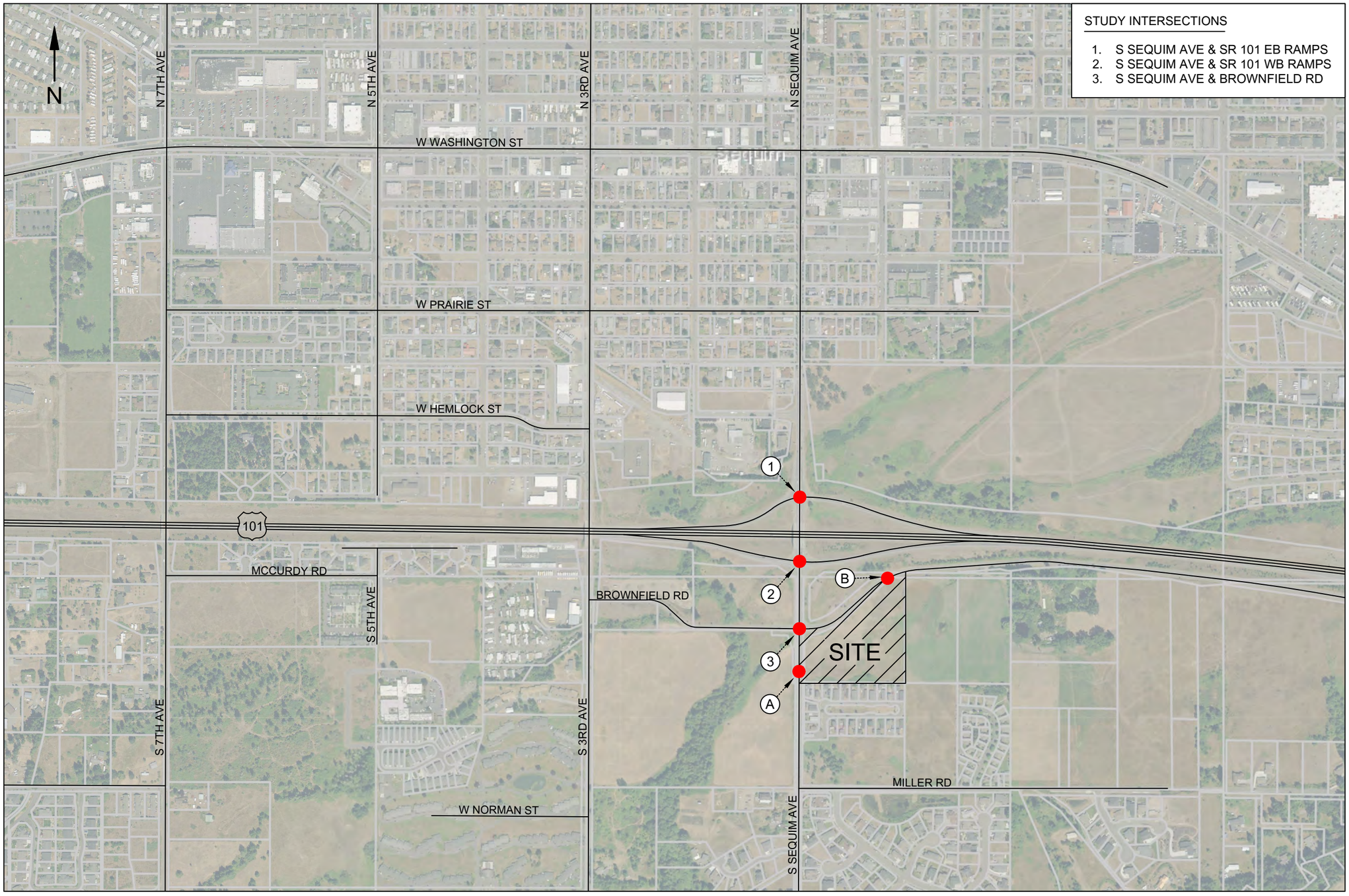




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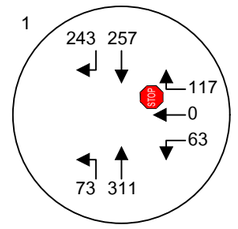
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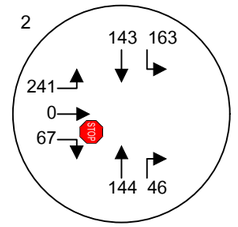
FORECAST 2028 PM PEAK HOUR BACKGROUND VOLUMES
FIGURE 6

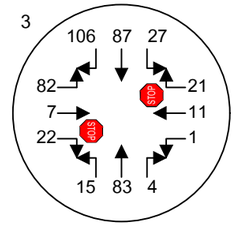


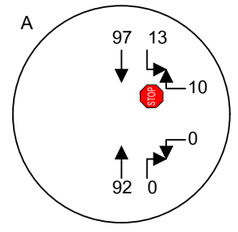
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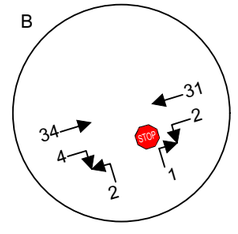
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HABITAT FOR HUMANITY - CLALLAM

FORECAST 2028 PM PEAK HOUR VOLUMES WITH PROJECT
FIGURE 7

4.4 Future Level of Service

Level of service analyses were made of the future PM peak hour volumes without (background) and with project related trips added to the key roadways and intersections. This analysis again involved the use of the *Synchro 12* program. Delays for the outlying study intersections and project accesses under future conditions are shown below in Table 6.

Table 6: Forecast 2028 Weekday PM Peak Hour Level of Service

Delays Given in Seconds per Vehicle

				Without Project		*With Project*	
Ref. #	**Intersection**	**Control**	**Movement**	**LOS**	**Delay**	**LOS**	**Delay**
1	S Sequim Ave & SR 101 WB Ramps	Stop	WB	B	14.4	C	15.0
2	S Sequim Ave & SR 101 EB Ramps	Stop	EB	C	22.3	C	23.1
3	S Sequim Ave & Brownfield Rd	Stop	EB	B	12.3	B	12.8
A	S Sequim Ave & Access	Stop	WB	-	-	A	8.8
B	Access & Brownfield Rd	Stop	NB	-	-	A	8.8

Forecast 2028 PM peak hour level of service at the outlying study intersections are estimated to operate with LOS C or better conditions without and with project-generated traffic, meeting City service level standards. Moreover, the project accesses on S Sequim Avenue and E Brownfield Road were shown to operate with LOS A conditions. Given the low background traffic volumes on the S 5th Avenue access roadway, no queuing deficiencies are anticipated at the project accesses as a result of the development proposal.

It should be noted that an *Intersection Control Evaluation* (ICE) conducted for the SR 101 & S Sequim Avenue interchanges (7/24/2023) indicated failing service levels at the eastbound ramps under forecast 2025 conditions. Our analysis indicated LOS C conditions with project under forecast 2028 conditions. The discrepancy in LOS output is contributed to higher baseline volumes observed within the ICE. Ultimately, it should be noted that the proposed development minimally impacts the SR 101 & S Sequim Avenue ramps, contributing less than one second of additional delay during the PM peak hour. As such, no mitigation on behalf of the development is identified at this time. This analysis indicated that peak hour volumes are variable at the interchange and actual driver delay may vary depending on season. Lastly, the ICE

recommended upgrading the interchange ramps (both eastbound and westbound) to roundabouts which is projected to improve conditions to LOS A.

Turn Lane Warrants

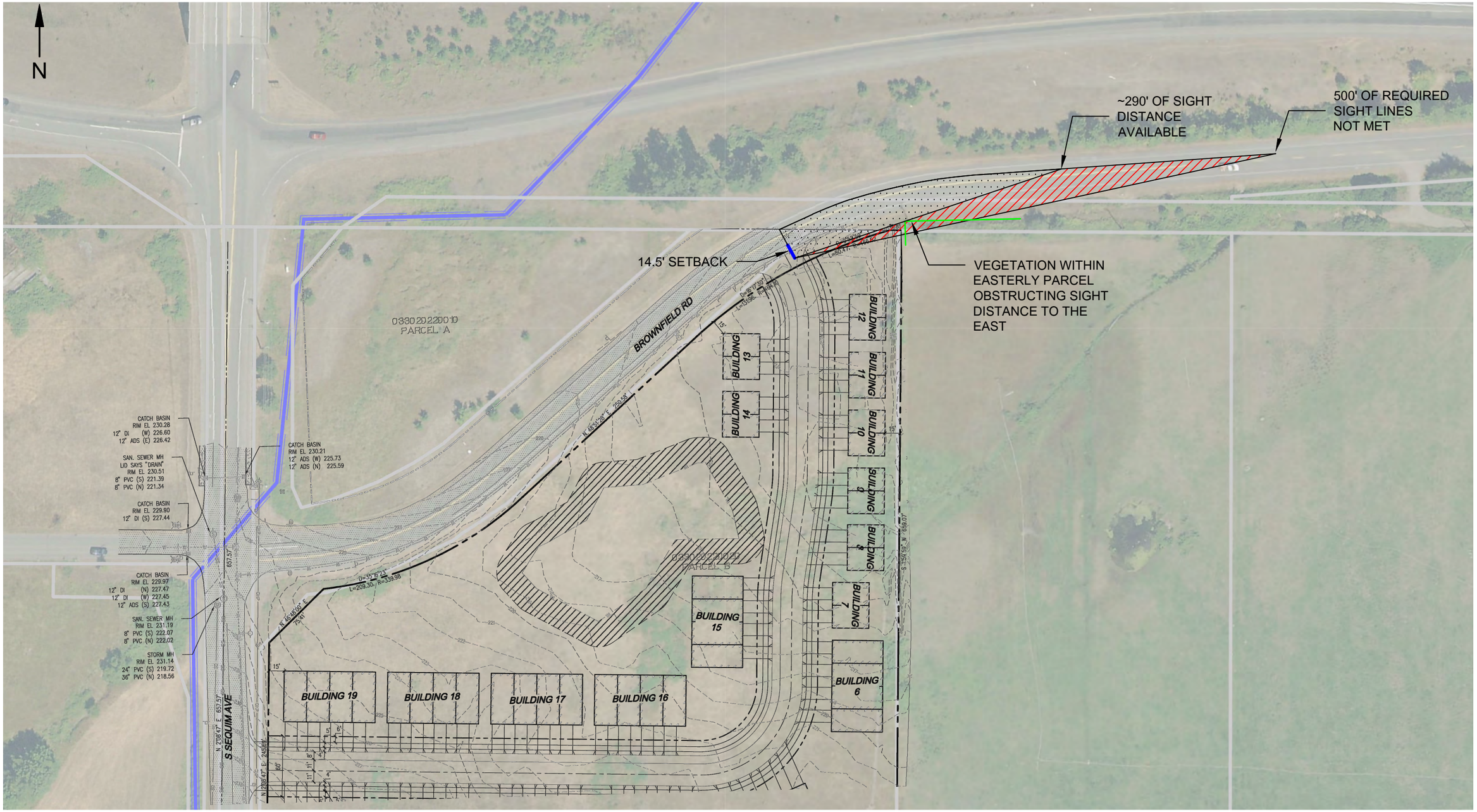
Both accesses to S Sequim Avenue and E Brownfield Road were reviewed for turn lane accommodations using WSDOT's warrant criteria. By inspection the low background volumes along both access roadways would not trigger either right- or -left-turn lanes under future conditions. Therefore, no turn lane improvements are recommended.

4.5 Project Access & Roadway Improvements

Access to/from the subject site is proposed via one roadway extending east from S Sequim Avenue and one roadway extending south from E Brownfield Road (see Figure 2). Sight distance was examined at the proposed accesses using AASHTO[4] standards. Based on the 30-mph posted speed (40-mph design speed) on S Sequim Avenue, approximately 445-feet of visibility would be required. Sight lines are available in excess of 500-feet looking both north and south on S Sequim Avenue.

Moreover, the 35-mph posted (45-mph design speed) of E Brownfield Road would require approximately 500-feet of sight lines. Looking southwest, sight lines are available in excess of 525-feet. Looking northeast, preliminary examinations indicate sight lines are partially obstructed to ~290-feet by vegetation on the south side of the roadway within the adjacent tax parcel #: 033029220020. Figure 8 on the following page illustrates approximate sight lines and limitations at the proposed E Brownfield Road access. Vegetation clearance within the right-of-way (and potentially partially on adjacent property) may be needed to meet City standards. Sight lines should be verified upon final site plan to ensure minimum distances are met.

[4] *American Association of State Highway and Transportation Officials (*AASHTO).



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Transportation Planning & Engineering

HABITAT FOR HUMANITY - CLALLAM

E BROWNFIELD ROAD ACCESS SIGHT DISTANCE EXHIBIT
FIGURE 8

5. CONCLUSIONS & MITIGATION

The Habitat for Humanity - Clallam project proposes for the development of 60 residential dwelling units in the city of Sequim. All dwelling units are to serve low-income households that are between 30% - 80% of Annual Median Income (AMI). Buildings comprise of townhouse or duplex style units. Development is to occur within 6.66-acre tax parcel #: 033029229020, which is bordered to the west by S Sequim Avenue and to the north by E Brownfield Road. Two new accesses are proposed to serve the subject site with one extending east from S Sequim Avenue and one extending south from E Brownfield Road. Refer to Figure 2, the conceptual site plan, for more details.

ITE data indicates the proposed development may generate approximately 407 AWDT, 26 AM peak hour trips (6 in / 20 out) and 32 PM peak hour trips (19 in / 13 out). Existing PM peak hour level of service (LOS) at the intersections of study indicated LOS C or better conditions. Forecast LOS analysis was performed using a five-year horizon which included a background growth rate, pipeline volumes and project-generated traffic added to the roadway network.

Forecast 2028 PM peak hour delays are anticipated to operate with LOS C or better delays at all outlying study intersections. It is acknowledged that failing future service levels are anticipated at the Westbound SR 101 & S Sequim Avenue intersection in a recently conducted ICE by WSDOT. However, the proposed Habitat for Humanity – Clallam project is anticipated to contribute minimal delays (less than one second) to the intersection.

The project driveways on S Sequim Avenue and E Brownfield Road were shown to operate acceptably with LOS A conditions. Lastly, left-turn lanes were found to not be warranted at the project accesses based on forecast 2028 PM peak hour conditions with project-generated traffic.

Based on this analysis, recommended mitigation is as follows:

1. Any frontage and/or roadway improvements on S Sequim Avenue and E Brownfield Road should be coordinated with the city of Sequim's Development Engineering regarding requirements and standards.

2. Sight distance should be verified for all new driveway approaches. Vegetation clearance along the south side of E Brownfield Road, east of the proposed access, may be needed to increase driver visibility leaving the site.

3. The proposed development may be subject to Traffic Impact Fees (TIF) as imposed by the city of Sequim. Fees are based on new dwelling unit, assessed at $1,628.00 per net new dwelling unit (multi-family residence). Therefore, an estimated fee calculation is as follows:

   60 dwelling units x $1,628.00 per daily trip = $97,680.00

   Actual traffic impact fees will be calculated and determined by the City prior to building permit issuance.

No other mitigation is identified at this time.

HABITAT FOR HUMANITY - CLALLAM
TRAFFIC IMPACT ANALYSIS

APPENDIX

Heath & Associates

PO Box 397 Puyallup, WA 98371

File Name : 5192b
Site Code : 00005192
Start Date : 8/15/2023
Page No : 1

Groups Printed- Passenger + - Heavy

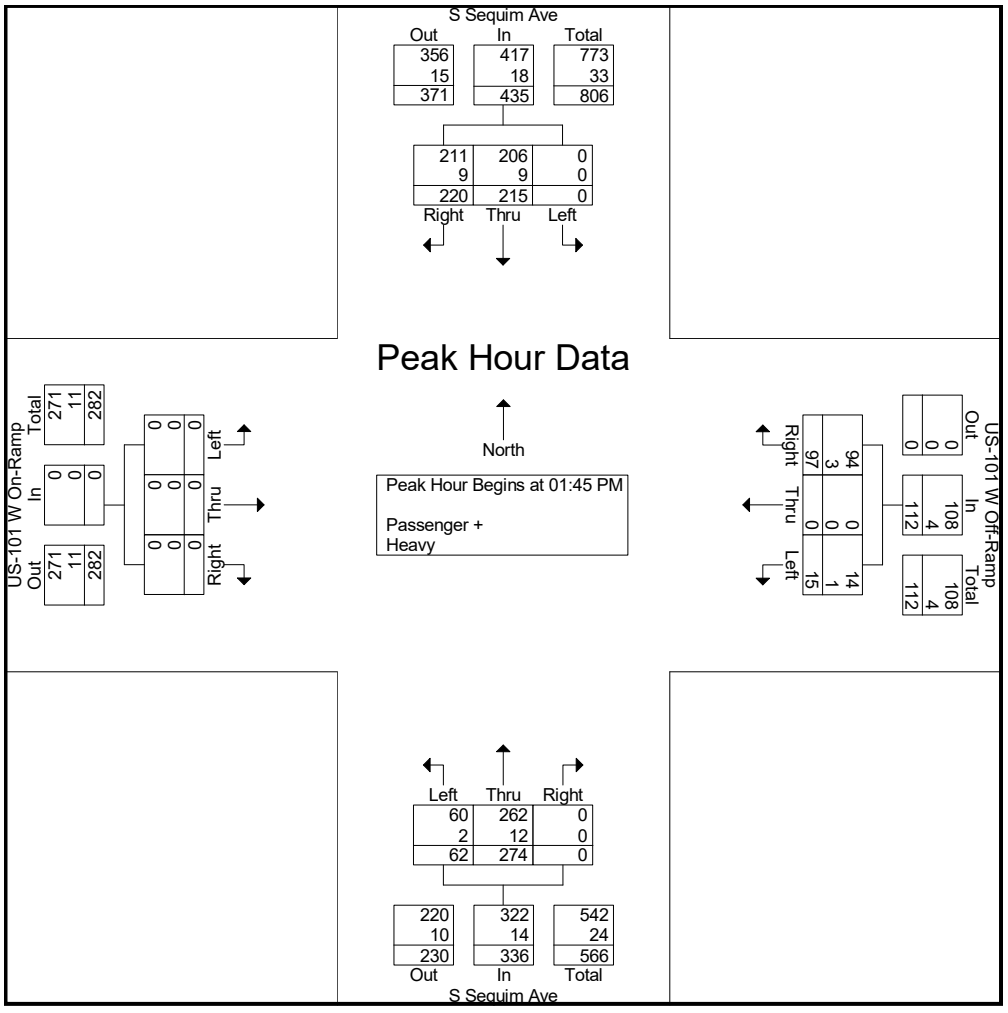
	S Sequim Ave Southbound				US-101 W Off-Ramp Westbound				S Sequim Ave Northbound				US-101 W On-Ramp Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
01:00 PM	66	37	0	103	21	0	2	23	0	71	11	82	0	0	0	0	208
01:15 PM	54	47	0	101	28	0	3	31	0	64	11	75	0	0	0	0	207
01:30 PM	55	45	0	100	19	0	1	20	0	56	14	70	0	0	0	0	190
01:45 PM	47	52	0	99	22	0	3	25	0	86	16	102	0	0	0	0	226
Total	222	181	0	403	90	0	9	99	0	277	52	329	0	0	0	0	831
02:00 PM	56	57	0	113	29	0	4	33	0	60	16	76	0	0	0	0	222
02:15 PM	65	52	0	117	25	0	4	29	0	62	20	82	0	0	0	0	228
02:30 PM	52	54	0	106	21	0	4	25	0	66	10	76	0	0	0	0	207
02:45 PM	43	46	0	89	30	0	2	32	0	76	9	85	0	0	0	0	206
Total	216	209	0	425	105	0	14	119	0	264	55	319	0	0	0	0	863
03:00 PM	67	46	0	113	16	0	2	18	0	48	11	59	0	0	0	0	190
03:15 PM	47	41	0	88	41	0	3	44	0	49	9	58	0	0	0	0	190
03:30 PM	50	54	0	104	24	0	2	26	0	58	16	74	0	0	0	0	204
03:45 PM	56	48	0	104	44	0	4	48	0	59	9	68	0	0	0	0	220
Total	220	189	0	409	125	0	11	136	0	214	45	259	0	0	0	0	804
04:00 PM	60	47	0	107	38	0	5	43	0	60	15	75	0	0	0	0	225
04:15 PM	64	34	0	98	33	0	7	40	0	48	14	62	0	0	0	0	200
04:30 PM	53	47	0	100	32	0	2	34	0	67	13	80	0	0	0	0	214
04:45 PM	56	40	0	96	44	0	2	46	0	85	13	98	0	0	0	0	240
Total	233	168	0	401	147	0	16	163	0	260	55	315	0	0	0	0	879
Grand Total	891	747	0	1638	467	0	50	517	0	1015	207	1222	0	0	0	0	3377
Apprch %	54.4	45.6	0		90.3	0	9.7		0	83.1	16.9		0	0	0		
Total %	26.4	22.1	0	48.5	13.8	0	1.5	15.3	0	30.1	6.1	36.2	0	0	0	0	
Passenger +	857	715	0	1572	448	0	46	494	0	972	197	1169	0	0	0	0	3235
% Passenger +	96.2	95.7	0	96	95.9	0	92	95.6	0	95.8	95.2	95.7	0	0	0	0	95.8
Heavy	34	32	0	66	19	0	4	23	0	43	10	53	0	0	0	0	142
% Heavy	3.8	4.3	0	4	4.1	0	8	4.4	0	4.2	4.8	4.3	0	0	0	0	4.2

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File Name : 5192b
Site Code : 00005192
Start Date : 8/15/2023
Page No : 2

	S Sequim Ave Southbound				US-101 W Off-Ramp Westbound				S Sequim Ave Northbound				US-101 W On-Ramp Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:45 PM																	
01:45 PM	47	52	0	99	22	0	3	25	0	**86**	16	**102**	0	0	0	0	226
02:00 PM	56	**57**	0	113	**29**	0	**4**	**33**	0	60	16	76	0	0	0	0	222
02:15 PM	**65**	52	0	**117**	25	0	4	29	0	62	**20**	82	0	0	0	0	**228**
02:30 PM	52	54	0	106	21	0	4	25	0	66	10	76	0	0	0	0	207
Total Volume	220	215	0	435	97	0	15	112	0	274	62	336	0	0	0	0	883
% App. Total	50.6	49.4	0		86.6	0	13.4		0	81.5	18.5		0	0	0		
PHF	.846	.943	.000	.929	.836	.000	.938	.848	.000	.797	.775	.824	.000	.000	.000	.000	.968
Passenger +	211	206	0	417	94	0	14	108	0	262	60	322	0	0	0	0	847
% Passenger +	95.9	95.8	0	95.9	96.9	0	93.3	96.4	0	95.6	96.8	95.8	0	0	0	0	95.9
Heavy	9	9	0	18	3	0	1	4	0	12	2	14	0	0	0	0	36
% Heavy	4.1	4.2	0	4.1	3.1	0	6.7	3.6	0	4.4	3.2	4.2	0	0	0	0	4.1



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File Name : 5192c
Site Code : 00005192
Start Date : 8/15/2023
Page No : 1

Groups Printed- Passenger + - Heavy

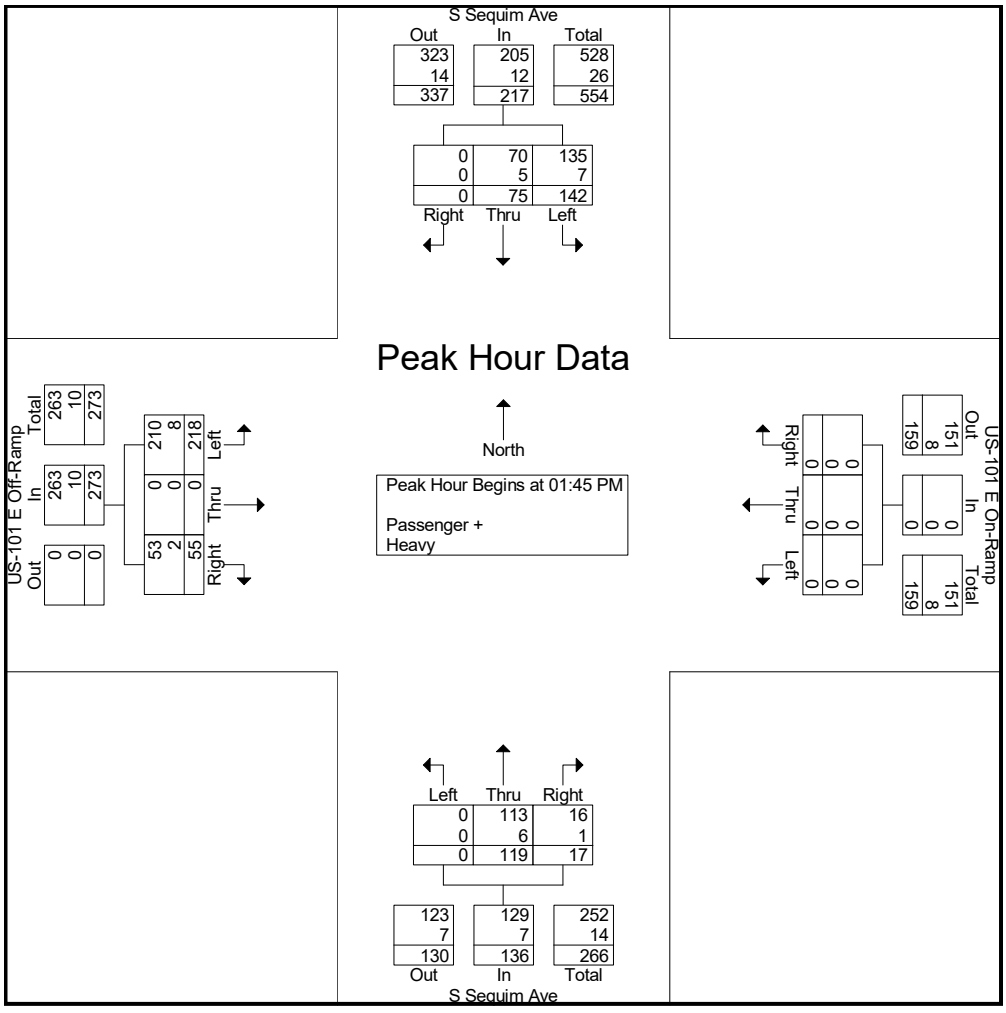
	S Sequim Ave Southbound				US-101 E On-Ramp Westbound				S Sequim Ave Northbound				US-101 E Off-Ramp Eastbound				
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01:00 PM	0	10	27	37	0	0	0	0	1	28	0	29	10	0	54	64	130
01:15 PM	0	20	35	55	0	0	0	0	2	33	0	35	7	0	44	51	141
01:30 PM	0	7	36	43	0	0	0	0	3	28	0	31	14	0	41	55	129
01:45 PM	0	15	38	53	0	0	0	0	2	38	0	40	13	0	57	70	163
Total	0	52	136	188	0	0	0	0	8	127	0	135	44	0	196	240	563
02:00 PM	0	22	35	57	0	0	0	0	3	31	0	34	21	0	46	67	158
02:15 PM	0	16	35	51	0	0	0	0	5	28	0	33	8	0	62	70	154
02:30 PM	0	22	34	56	0	0	0	0	7	22	0	29	13	0	53	66	151
02:45 PM	0	16	30	46	0	0	0	0	8	25	0	33	17	0	59	76	155
Total	0	76	134	210	0	0	0	0	23	106	0	129	59	0	220	279	618
03:00 PM	0	15	32	47	0	0	0	0	3	21	0	24	10	0	36	46	117
03:15 PM	0	15	26	41	0	0	0	0	5	17	0	22	15	0	44	59	122
03:30 PM	0	16	38	54	0	0	0	0	4	29	0	33	19	0	50	69	156
03:45 PM	0	18	32	50	0	0	0	0	3	23	0	26	16	0	52	68	144
Total	0	64	128	192	0	0	0	0	15	90	0	105	60	0	182	242	539
04:00 PM	0	18	35	53	0	0	0	0	0	21	0	21	14	0	52	66	140
04:15 PM	0	17	25	42	0	0	0	0	0	21	0	21	13	0	45	58	121
04:30 PM	0	12	33	45	0	0	0	0	1	28	0	29	16	0	50	66	140
04:45 PM	0	13	29	42	0	0	0	0	4	27	0	31	11	0	69	80	153
Total	0	60	122	182	0	0	0	0	5	97	0	102	54	0	216	270	554
Grand Total	0	252	520	772	0	0	0	0	51	420	0	471	217	0	814	1031	2274
Apprch %	0	32.6	67.4		0	0	0		10.8	89.2	0		21	0	79		
Total %	0	11.1	22.9	33.9	0	0	0	0	2.2	18.5	0	20.7	9.5	0	35.8	45.3	
Passenger +	0	238	499	737	0	0	0	0	46	397	0	443	206	0	780	986	2166
% Passenger +	0	94.4	96	95.5	0	0	0	0	90.2	94.5	0	94.1	94.9	0	95.8	95.6	95.3
Heavy	0	14	21	35	0	0	0	0	5	23	0	28	11	0	34	45	108
% Heavy	0	5.6	4	4.5	0	0	0	0	9.8	5.5	0	5.9	5.1	0	4.2	4.4	4.7

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File Name : 5192c
Site Code : 00005192
Start Date : 8/15/2023
Page No : 2

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Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:45 PM																	
01:45 PM	0	15	**38**	53	0	0	0	0	2	**38**	0	**40**	13	0	57	**70**	**163**
02:00 PM	0	**22**	35	**57**	0	0	0	0	3	31	0	34	**21**	0	46	67	158
02:15 PM	0	16	35	51	0	0	0	0	5	28	0	33	8	0	**62**	70	154
02:30 PM	0	22	34	56	0	0	0	0	**7**	22	0	29	13	0	53	66	151
Total Volume	0	75	142	217	0	0	0	0	17	119	0	136	55	0	218	273	626
% App. Total	0	34.6	65.4		0	0	0		12.5	87.5	0		20.1	0	79.9		
PHF	.000	.852	.934	.952	.000	.000	.000	.000	.607	.783	.000	.850	.655	.000	.879	.975	.960
Passenger +	0	70	135	205	0	0	0	0	16	113	0	129	53	0	210	263	597
% Passenger +	0	93.3	95.1	94.5	0	0	0	0	94.1	95.0	0	94.9	96.4	0	96.3	96.3	95.4
Heavy	0	5	7	12	0	0	0	0	1	6	0	7	2	0	8	10	29
% Heavy	0	6.7	4.9	5.5	0	0	0	0	5.9	5.0	0	5.1	3.6	0	3.7	3.7	4.6



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File Name : 5192d
Site Code : 00005192
Start Date : 8/15/2023
Page No : 1

Groups Printed- Passenger + - Heavy

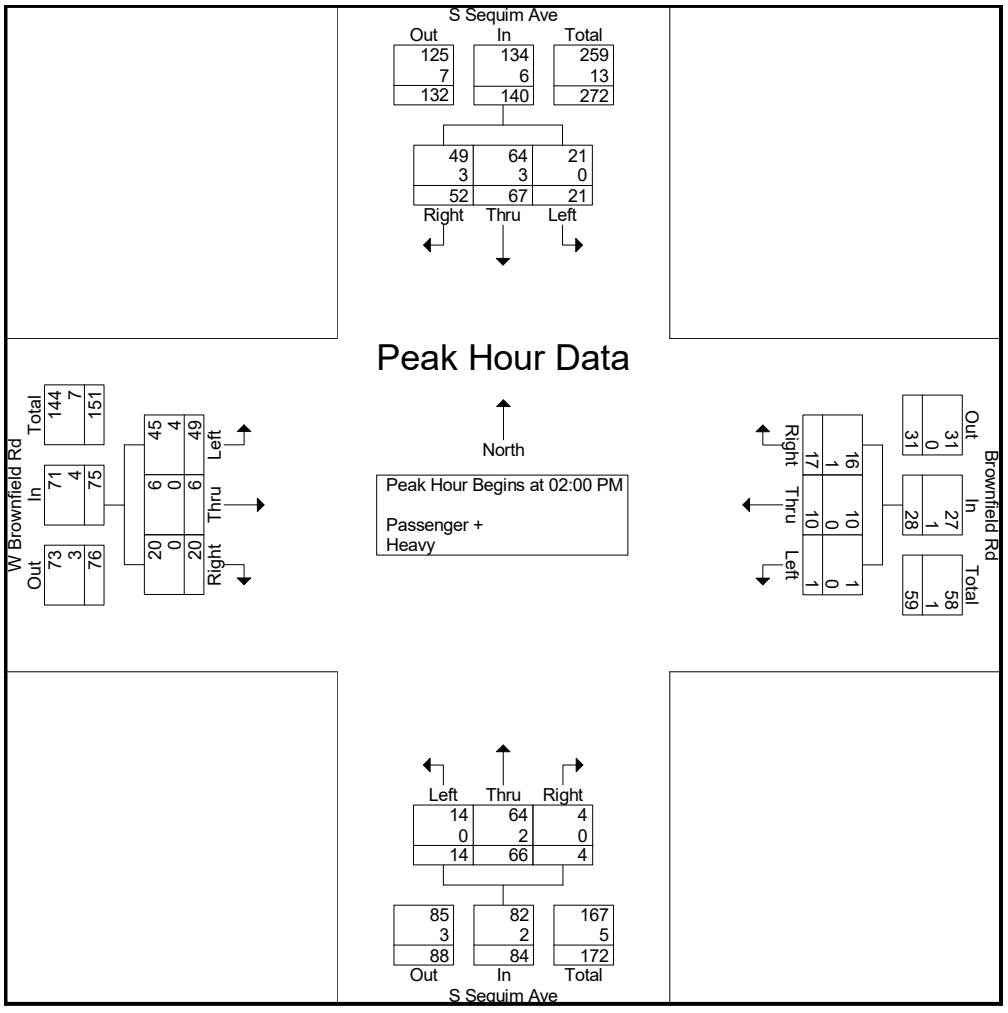
	S Sequim Ave Southbound				Brownfield Rd Westbound				S Sequim Ave Northbound				W Brownfield Rd Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
01:00 PM	10	7	5	22	2	4	2	8	0	17	2	19	7	0	10	17	66
01:15 PM	10	12	5	27	7	5	0	12	1	17	4	22	4	2	11	17	78
01:30 PM	5	8	5	18	6	2	1	9	0	20	4	24	7	1	7	15	66
01:45 PM	9	11	7	27	6	0	0	6	2	20	6	28	5	2	13	20	81
Total	34	38	22	94	21	11	3	35	3	74	16	93	23	5	41	69	291
02:00 PM	19	16	9	44	5	2	0	7	0	18	3	21	7	2	12	21	93
02:15 PM	8	18	1	27	5	3	0	8	1	15	3	19	4	2	11	17	71
02:30 PM	14	18	4	36	4	5	0	9	0	18	4	22	6	0	8	14	81
02:45 PM	11	15	7	33	3	0	1	4	3	15	4	22	3	2	18	23	82
Total	52	67	21	140	17	10	1	28	4	66	14	84	20	6	49	75	327
03:00 PM	9	13	3	25	3	3	0	6	0	14	0	14	8	3	7	18	63
03:15 PM	11	13	4	28	3	1	0	4	0	9	3	12	4	2	12	18	62
03:30 PM	10	20	7	37	3	2	0	5	0	14	3	17	3	0	13	16	75
03:45 PM	13	13	5	31	6	0	1	7	1	12	1	14	3	0	7	10	62
Total	43	59	19	121	15	6	1	22	1	49	7	57	18	5	39	62	262
04:00 PM	9	17	6	32	4	3	1	8	0	12	2	14	3	1	5	9	63
04:15 PM	14	15	3	32	2	1	1	4	0	11	0	11	4	0	7	11	58
04:30 PM	11	12	5	28	5	1	3	9	3	12	1	16	5	0	11	16	69
04:45 PM	8	9	6	23	6	2	0	8	4	7	2	13	1	4	14	19	63
Total	42	53	20	115	17	7	5	29	7	42	5	54	13	5	37	55	253
Grand Total	171	217	82	470	70	34	10	114	15	231	42	288	74	21	166	261	1133
Apprch %	36.4	46.2	17.4		61.4	29.8	8.8		5.2	80.2	14.6		28.4	8	63.6		
Total %	15.1	19.2	7.2	41.5	6.2	3	0.9	10.1	1.3	20.4	3.7	25.4	6.5	1.9	14.7	23	
Passenger +	159	208	79	446	67	34	9	110	14	219	39	272	74	21	153	248	1076
% Passenger +	93	95.9	96.3	94.9	95.7	100	90	96.5	93.3	94.8	92.9	94.4	100	100	92.2	95	95
Heavy	12	9	3	24	3	0	1	4	1	12	3	16	0	0	13	13	57
% Heavy	7	4.1	3.7	5.1	4.3	0	10	3.5	6.7	5.2	7.1	5.6	0	0	7.8	5	5

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PO Box 397 Puyallup, WA 98371

File Name : 5192d
Site Code : 00005192
Start Date : 8/15/2023
Page No : 2

	S Sequim Ave Southbound				Brownfield Rd Westbound				S Sequim Ave Northbound				W Brownfield Rd Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	**19**	16	**9**	**44**	**5**	2	0	7	0	**18**	3	21	**7**	**2**	12	21	**93**
02:15 PM	8	**18**	1	27	5	3	0	8	1	15	3	19	4	2	11	17	71
02:30 PM	14	18	4	36	4	**5**	0	**9**	0	18	**4**	**22**	6	0	8	14	81
02:45 PM	11	15	7	33	3	0	**1**	4	**3**	15	4	22	3	2	**18**	**23**	82
Total Volume	52	67	21	140	17	10	1	28	4	66	14	84	20	6	49	75	327
% App. Total	37.1	47.9	15		60.7	35.7	3.6		4.8	78.6	16.7		26.7	8	65.3		
PHF	.684	.931	.583	.795	.850	.500	.250	.778	.333	.917	.875	.955	.714	.750	.681	.815	.879
Passenger +	49	64	21	134	16	10	1	27	4	64	14	82	20	6	45	71	314
% Passenger +	94.2	95.5	100	95.7	94.1	100	100	96.4	100	97.0	100	97.6	100	100	91.8	94.7	96.0
Heavy	3	3	0	6	1	0	0	1	0	2	0	2	0	0	4	4	13
% Heavy	5.8	4.5	0	4.3	5.9	0	0	3.6	0	3.0	0	2.4	0	0	8.2	5.3	4.0



Single-Family Attached Housing
(215)

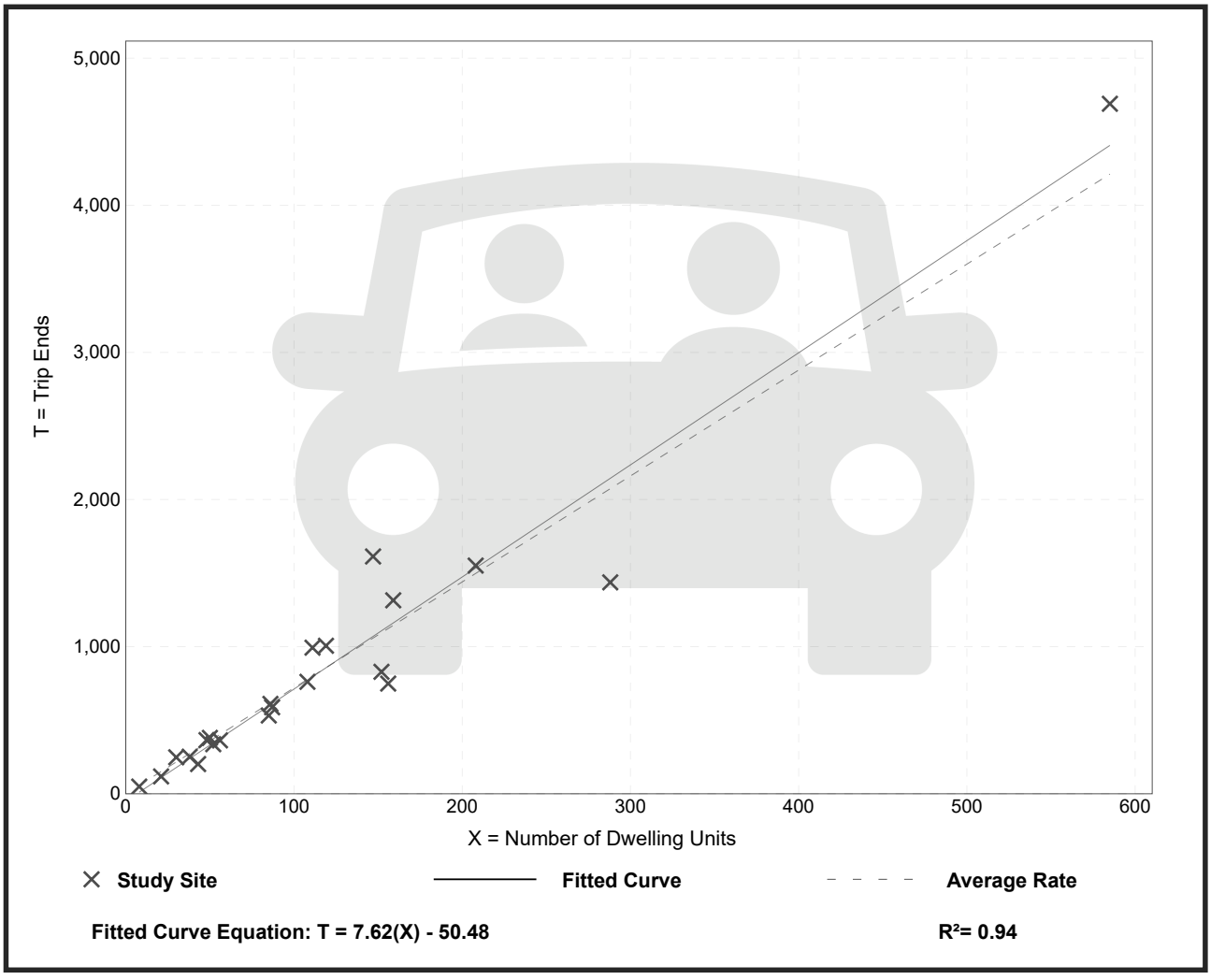
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



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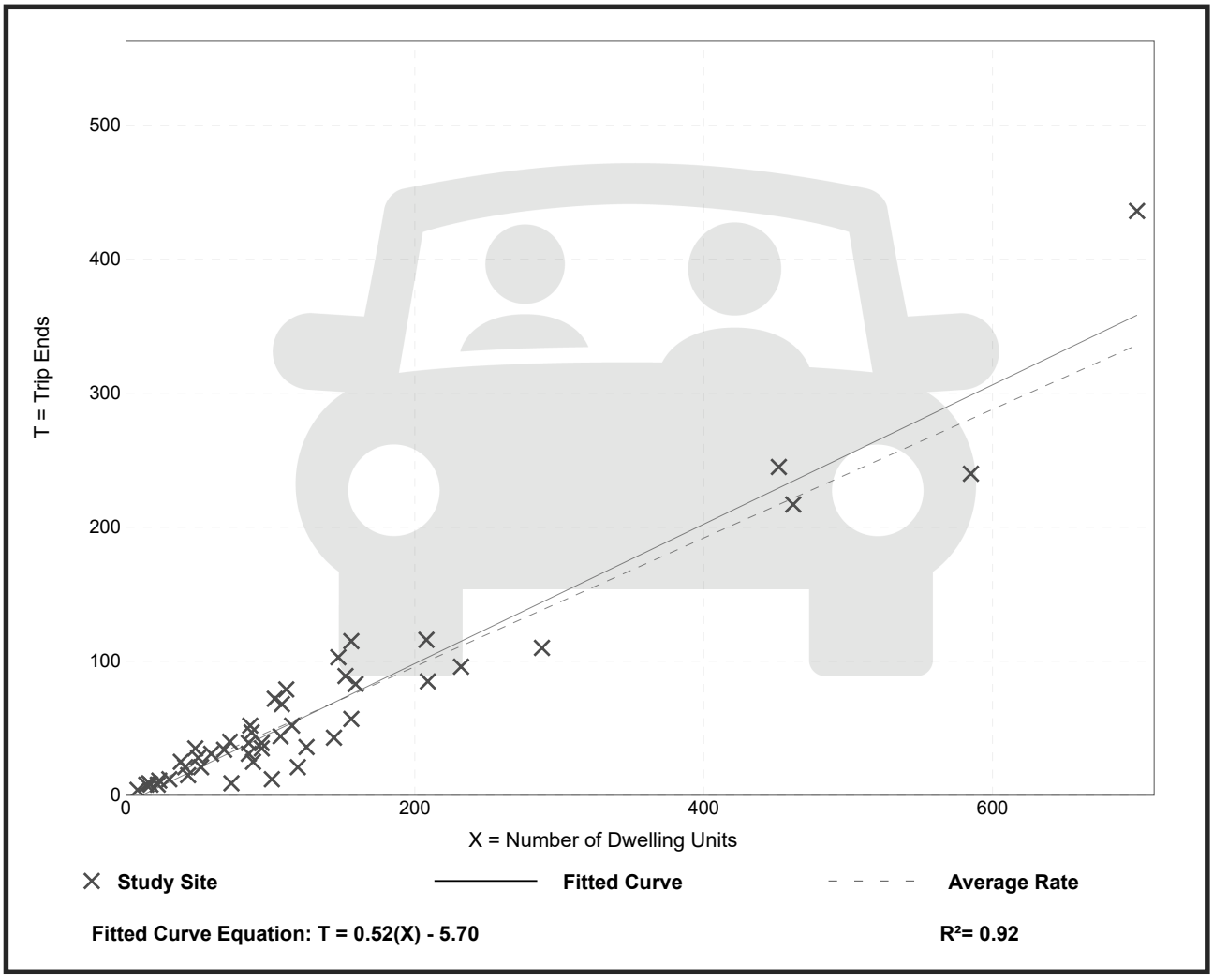
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



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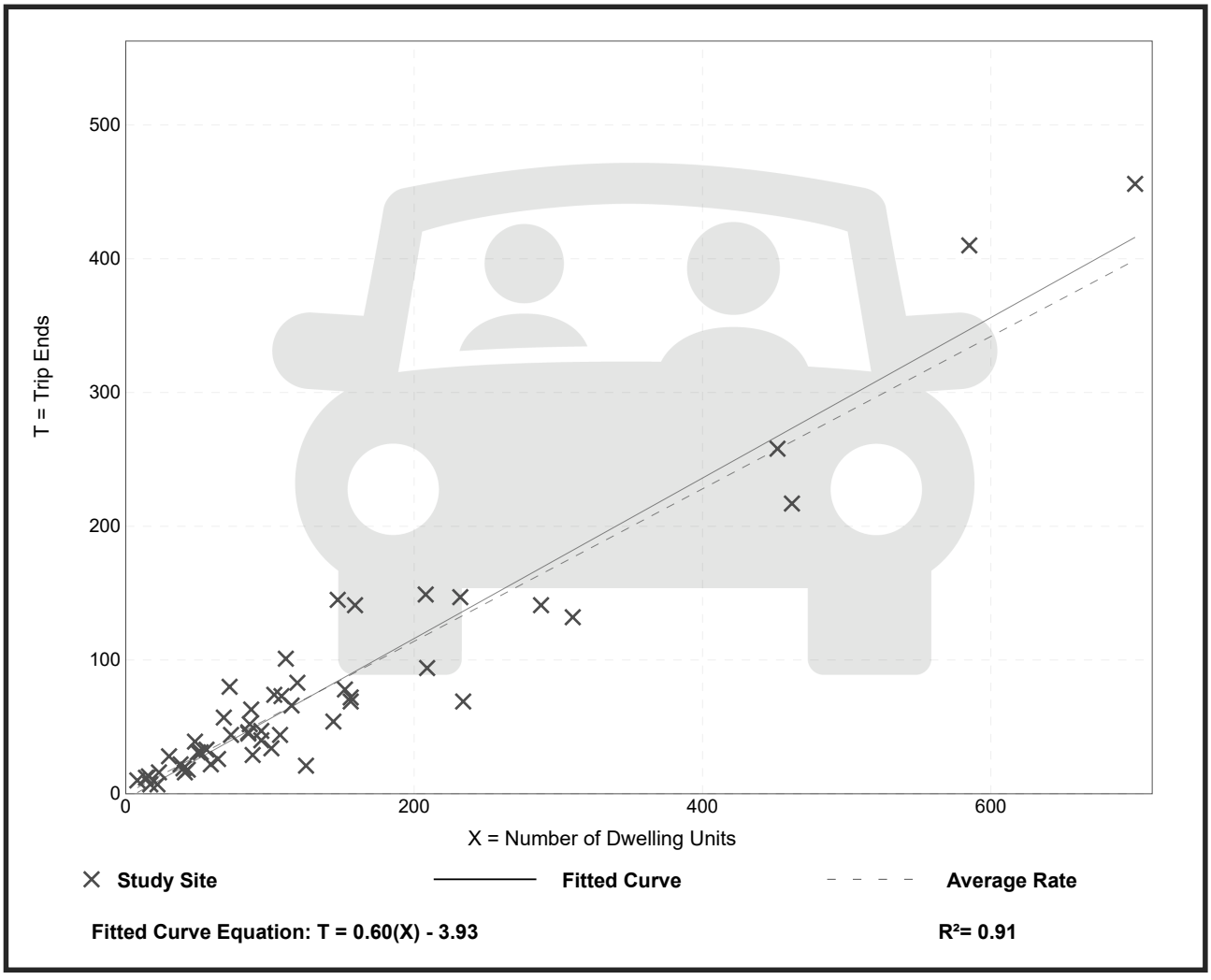
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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1. S Sequim Ave & SR-101 WB Ramps

PM Peak Hour
Pipeline Volume Summations

1. Effie Estates	0	2	0	3	0	0	0	0	0	0	0	0
2. Legacy Ridge		2						1				
3. Home A & B												
4. Rolling Hills		7				40		4				
5. McCurdy Plat		4		7								
Totals	0	15	0	10	0	40	0	5	0	0	0	0

2. S Sequim Ave & SR-101 EB Ramps

PM Peak Hour
Pipeline Volume Summations

1. Effie Estates	0	0	2	0	0	0	0	0	0	0	0	0
2. Legacy Ridge		2						1				
3. Home A & B												
4. Rolling Hills		47					23	4				
5. McCurdy Plat			4									
Totals	0	49	6	0	0	0	23	5	0	0	0	0

3. S Sequim Ave & Brownfield Rd

PM Peak Hour
Pipeline Volume Summations

1. Effie Estates	0	0	0	0	0	0	0	0	0	0	0	0
2. Legacy Ridge	2											1
3. Home A & B												
4. Rolling Hills	47											27
5. McCurdy Plat	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	0	0	0	0	0	0	0	0	0	0	28

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	15	0	97	62	274	0	0	215	220
Future Vol, veh/h	0	0	0	15	0	97	62	274	0	0	215	220
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	-	-	-	-	-	-	275	-	-	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	7	1	3	3	4	1	1	4	4
Mvmt Flow	0	0	0	15	0	100	64	282	0	0	222	227

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	632	859	282	448	0	-	-	-	0
Stage 1	410	410	-	-	-	-	-	-	-
Stage 2	222	448	-	-	-	-	-	-	-
Critical Hdwy	6.47	6.51	6.23	4.13	-	-	-	-	-
Critical Hdwy Stg 1	5.47	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.47	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.009	3.327	2.227	-	-	-	-	-
Pot Cap-1 Maneuver	437	295	754	1107	-	0	0	-	-
Stage 1	659	597	-	-	-	0	0	-	-
Stage 2	804	574	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	411	0	754	1107	-	-	-	-	-
Mov Cap-2 Maneuver	411	0	-	-	-	-	-	-	-
Stage 1	621	0	-	-	-	-	-	-	-
Stage 2	804	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	11.39	1.56	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1107	-	678	-	-
HCM Lane V/C Ratio	0.058	-	0.17	-	-
HCM Control Delay (s/veh)	8.5	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	218	0	55	0	0	0	0	119	17	142	75	0
Future Vol, veh/h	218	0	55	0	0	0	0	119	17	142	75	0
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	1	4	1	1	1	1	5	6	5	7	1
Mvmt Flow	227	0	57	0	0	0	0	124	18	148	78	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	498	516	78	-	0	0	142	0	0
Stage 1	374	374	-	-	-	-	-	-	-
Stage 2	124	142	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.51	6.24	-	-	-	4.15	-	-
Critical Hdwy Stg 1	5.44	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.009	3.336	-	-	-	2.245	-	-
Pot Cap-1 Maneuver	528	465	977	0	-	-	1423	-	0
Stage 1	691	619	-	0	-	-	-	-	0
Stage 2	897	781	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	473	0	977	-	-	-	1423	-	-
Mov Cap-2 Maneuver	473	0	-	-	-	-	-	-	-
Stage 1	691	0	-	-	-	-	-	-	-
Stage 2	803	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	17.3	0	5.12
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	473	977	1423	-
HCM Lane V/C Ratio	-	-	0.48	0.059	0.104	-
HCM Control Delay (s/veh)	-	-	19.4	8.9	7.8	-
HCM Lane LOS	-	-	C	A	A	-
HCM 95th %tile Q(veh)	-	-	2.6	0.2	0.3	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↱			↕			↕	
Traffic Vol, veh/h	49	6	20	1	10	17	14	66	4	21	67	52
Future Vol, veh/h	49	6	20	1	10	17	14	66	4	21	67	52
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	-	-	-	40	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	8	1	1	1	1	6	1	3	1	1	5	6
Mvmt Flow	56	7	23	1	11	19	16	75	5	24	76	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	266	265	106	236	292	77	135	0	0	80	0	0
Stage 1	153	153	-	109	109	-	-	-	-	-	-	-
Stage 2	113	111	-	127	183	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.51	6.21	7.11	6.51	6.26	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.18	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.009	3.309	3.509	4.009	3.354	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	675	642	951	720	620	973	1455	-	-	1525	-	-
Stage 1	835	772	-	899	807	-	-	-	-	-	-	-
Stage 2	878	805	-	879	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	631	624	951	676	603	973	1455	-	-	1525	-	-
Mov Cap-2 Maneuver	631	624	-	676	603	-	-	-	-	-	-	-
Stage 1	821	759	-	888	798	-	-	-	-	-	-	-
Stage 2	839	796	-	836	737	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	10.93	9.75	1.25	1.11
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	297	-	-	692	676	793	248	-	-
HCM Lane V/C Ratio	0.011	-	-	0.123	0.002	0.039	0.016	-	-
HCM Control Delay (s/veh)	7.5	0	-	10.9	10.3	9.7	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	57	0	117	68	308	0	0	252	243
Future Vol, veh/h	0	0	0	57	0	117	68	308	0	0	252	243
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	-	-	-	-	-	-	275	-	-	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	7	1	3	3	4	1	1	4	4
Mvmt Flow	0	0	0	57	0	117	68	308	0	0	252	243

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	696	939	308	495	0	-	-	-	0	
Stage 1	444	444	-	-	-	-	-	-	-	
Stage 2	252	495	-	-	-	-	-	-	-	
Critical Hdwy	6.47	6.51	6.23	4.13	-	-	-	-	-	
Critical Hdwy Stg 1	5.47	5.51	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.47	5.51	-	-	-	-	-	-	-	
Follow-up Hdwy	3.563	4.009	3.327	2.227	-	-	-	-	-	
Pot Cap-1 Maneuver	400	265	730	1064	-	0	0	-	-	
Stage 1	636	577	-	-	-	0	0	-	-	
Stage 2	778	548	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	375	0	730	1064	-	-	-	-	-	
Mov Cap-2 Maneuver	375	0	-	-	-	-	-	-	-	
Stage 1	595	0	-	-	-	-	-	-	-	
Stage 2	778	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s/v	14.38	1.56	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1064	-	557	-	-
HCM Lane V/C Ratio	0.064	-	0.313	-	-
HCM Control Delay (s/veh)	8.6	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.3	-	-

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	241	0	61	0	0	0	0	136	42	163	132	0
Future Vol, veh/h	241	0	61	0	0	0	0	136	42	163	132	0
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	1	4	1	1	1	1	5	6	5	7	1
Mvmt Flow	241	0	61	0	0	0	0	136	42	163	132	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	594	636	132	-	0	0	178	0	0
Stage 1	458	458	-	-	-	-	-	-	-
Stage 2	136	178	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.51	6.24	-	-	-	4.15	-	-
Critical Hdwy Stg 1	5.44	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.009	3.336	-	-	-	2.245	-	-
Pot Cap-1 Maneuver	464	397	912	0	-	-	1380	-	0
Stage 1	633	569	-	0	-	-	-	-	0
Stage 2	886	754	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	410	0	912	-	-	-	1380	-	-
Mov Cap-2 Maneuver	410	0	-	-	-	-	-	-	-
Stage 1	633	0	-	-	-	-	-	-	-
Stage 2	781	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	22.3	0	4.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	410	912	1380	-
HCM Lane V/C Ratio	-	-	0.589	0.067	0.118	-
HCM Control Delay (s/veh)	-	-	25.6	9.2	8	-
HCM Lane LOS	-	-	D	A	A	-
HCM 95th %tile Q(veh)	-	-	3.7	0.2	0.4	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Vol, veh/h	82	7	22	1	11	19	15	73	4	23	74	106
Future Vol, veh/h	82	7	22	1	11	19	15	73	4	23	74	106
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	-	-	-	40	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	8	1	1	1	1	6	1	3	1	1	5	6
Mvmt Flow	93	8	25	1	13	22	17	83	5	26	84	120

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	320	318	144	260	376	85	205	0	0	88	0	0
Stage 1	197	197	-	119	119	-	-	-	-	-	-	-
Stage 2	123	122	-	140	257	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.51	6.21	7.11	6.51	6.26	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.18	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.009	3.309	3.509	4.009	3.354	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	621	600	906	695	557	963	1373	-	-	1515	-	-
Stage 1	792	740	-	888	799	-	-	-	-	-	-	-
Stage 2	866	797	-	865	697	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	575	580	906	645	539	963	1373	-	-	1515	-	-
Mov Cap-2 Maneuver	575	580	-	645	539	-	-	-	-	-	-	-
Stage 1	776	725	-	876	788	-	-	-	-	-	-	-
Stage 2	823	787	-	816	683	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	12.29	10.07	1.25	0.84
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	290	-	-	620	645	747	182	-	-
HCM Lane V/C Ratio	0.012	-	-	0.203	0.002	0.046	0.017	-	-
HCM Control Delay (s/veh)	7.7	0	-	12.3	10.6	10	7.4	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	63	0	117	73	311	0	0	257	243
Future Vol, veh/h	0	0	0	63	0	117	73	311	0	0	257	243
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	-	-	-	-	-	-	275	-	-	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	7	1	3	3	4	1	1	4	4
Mvmt Flow	0	0	0	63	0	117	73	311	0	0	257	243

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	714	957	311	500	0	-	-	-	0	
Stage 1	457	457	-	-	-	-	-	-	-	
Stage 2	257	500	-	-	-	-	-	-	-	
Critical Hdwy	6.47	6.51	6.23	4.13	-	-	-	-	-	
Critical Hdwy Stg 1	5.47	5.51	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.47	5.51	-	-	-	-	-	-	-	
Follow-up Hdwy	3.563	4.009	3.327	2.227	-	-	-	-	-	
Pot Cap-1 Maneuver	391	259	727	1059	-	0	0	-	-	
Stage 1	627	569	-	-	-	0	0	-	-	
Stage 2	774	545	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	364	0	727	1059	-	-	-	-	-	
Mov Cap-2 Maneuver	364	0	-	-	-	-	-	-	-	
Stage 1	584	0	-	-	-	-	-	-	-	
Stage 2	774	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s/v	15	1.64	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1059	-	539	-	-
HCM Lane V/C Ratio	0.069	-	0.334	-	-
HCM Control Delay (s/veh)	8.7	-	15	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-

Intersection	
Int Delay, s/veh	10.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	241	0	67	0	0	0	0	144	46	163	143	0
Future Vol, veh/h	241	0	67	0	0	0	0	144	46	163	143	0
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	1	4	1	1	1	1	5	6	5	7	1
Mvmt Flow	241	0	67	0	0	0	0	144	46	163	143	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	613	659	143	-	0	0	190	0	0
Stage 1	469	469	-	-	-	-	-	-	-
Stage 2	144	190	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.51	6.24	-	-	-	4.15	-	-
Critical Hdwy Stg 1	5.44	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.009	3.336	-	-	-	2.245	-	-
Pot Cap-1 Maneuver	453	385	899	0	-	-	1366	-	0
Stage 1	625	562	-	0	-	-	-	-	0
Stage 2	878	745	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	399	0	899	-	-	-	1366	-	-
Mov Cap-2 Maneuver	399	0	-	-	-	-	-	-	-
Stage 1	625	0	-	-	-	-	-	-	-
Stage 2	773	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	23.08	0	4.26
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	399	899	1366	-
HCM Lane V/C Ratio	-	-	0.605	0.075	0.119	-
HCM Control Delay (s/veh)	-	-	26.9	9.3	8	-
HCM Lane LOS	-	-	D	A	A	-
HCM 95th %tile Q(veh)	-	-	3.8	0.2	0.4	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↱			↕			↕	
Traffic Vol, veh/h	82	7	22	1	11	21	15	83	4	27	87	106
Future Vol, veh/h	82	7	22	1	11	21	15	83	4	27	87	106
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	-	-	-	40	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	8	1	1	1	1	6	1	3	1	1	5	6
Mvmt Flow	93	8	25	1	13	24	17	94	5	31	99	120

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	355	353	159	295	411	97	219	0	0	99	0	0
Stage 1	220	220	-	131	131	-	-	-	-	-	-	-
Stage 2	135	133	-	164	281	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.51	6.21	7.11	6.51	6.26	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.18	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.009	3.309	3.509	4.009	3.354	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	589	573	889	659	532	949	1356	-	-	1500	-	-
Stage 1	769	723	-	875	790	-	-	-	-	-	-	-
Stage 2	854	788	-	840	680	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	540	552	889	609	512	949	1356	-	-	1500	-	-
Mov Cap-2 Maneuver	540	552	-	609	512	-	-	-	-	-	-	-
Stage 1	750	706	-	864	779	-	-	-	-	-	-	-
Stage 2	809	778	-	788	664	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	12.81	10.18	1.13	0.91
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	262	-	-	587	609	734	199	-	-
HCM Lane V/C Ratio	0.013	-	-	0.215	0.002	0.05	0.02	-	-
HCM Control Delay (s/veh)	7.7	0	-	12.8	10.9	10.2	7.4	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	92	0	13	97
Future Vol, veh/h	0	10	92	0	13	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	5
Mvmt Flow	0	11	100	0	14	105

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	234	100	0	0	100	0
Stage 1	100	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	754	956	-	-	1493	-
Stage 1	924	-	-	-	-	-
Stage 2	893	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	747	956	-	-	1493	-
Mov Cap-2 Maneuver	747	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.81	0	0.88
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	956	213	-
HCM Lane V/C Ratio	-	-	0.011	0.009	-
HCM Control Delay (s/veh)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	34	4	2	31	2	1
Future Vol, veh/h	34	4	2	31	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	3	1	1
Mvmt Flow	37	4	2	34	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	41	0	77	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	38	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1574	-	928	1035
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1574	-	927	1035
Mov Cap-2 Maneuver	-	-	-	-	927	-
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	986	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.44	8.76
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	960	-	-	109	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Control Delay (s/veh)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized

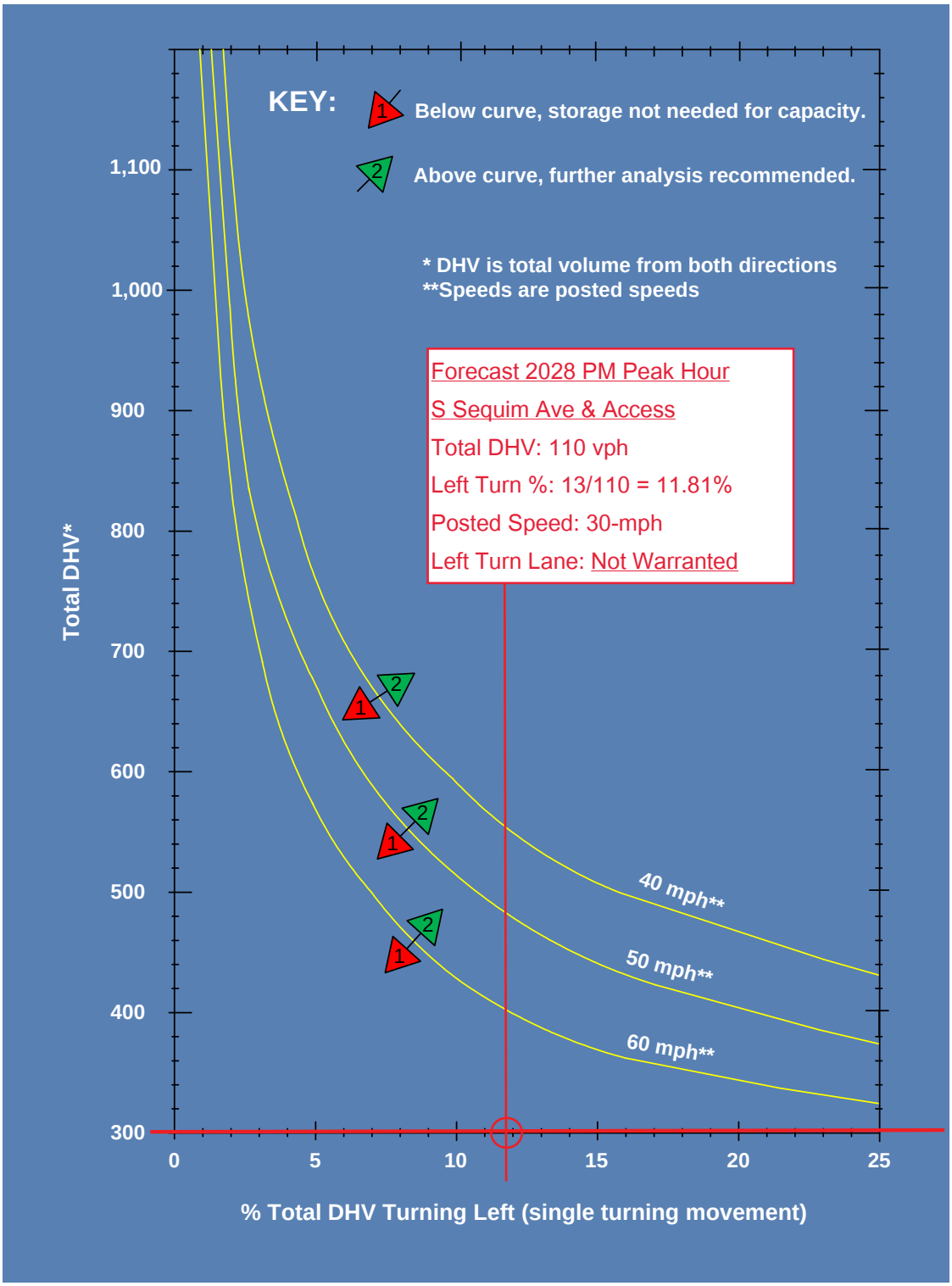
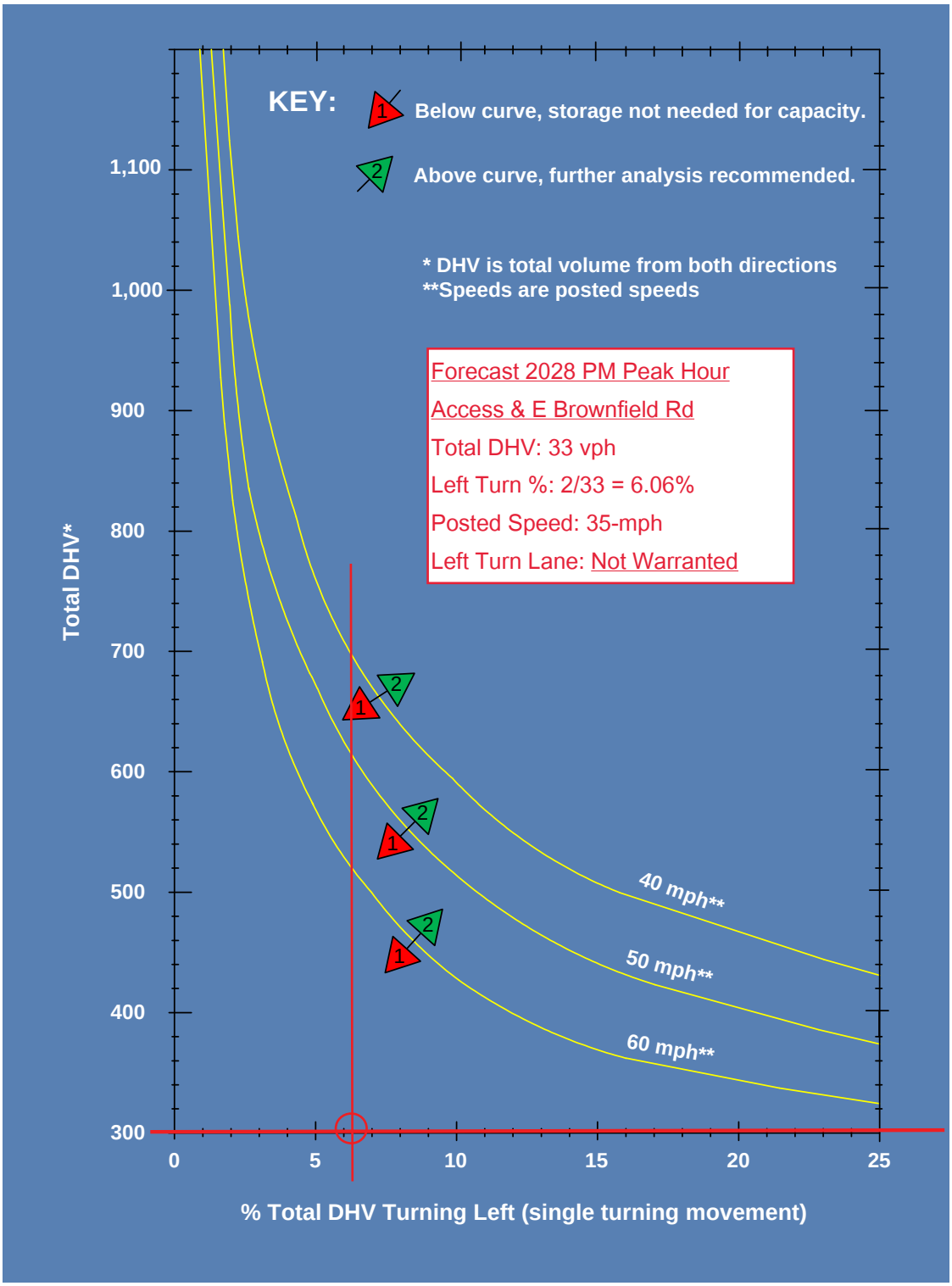
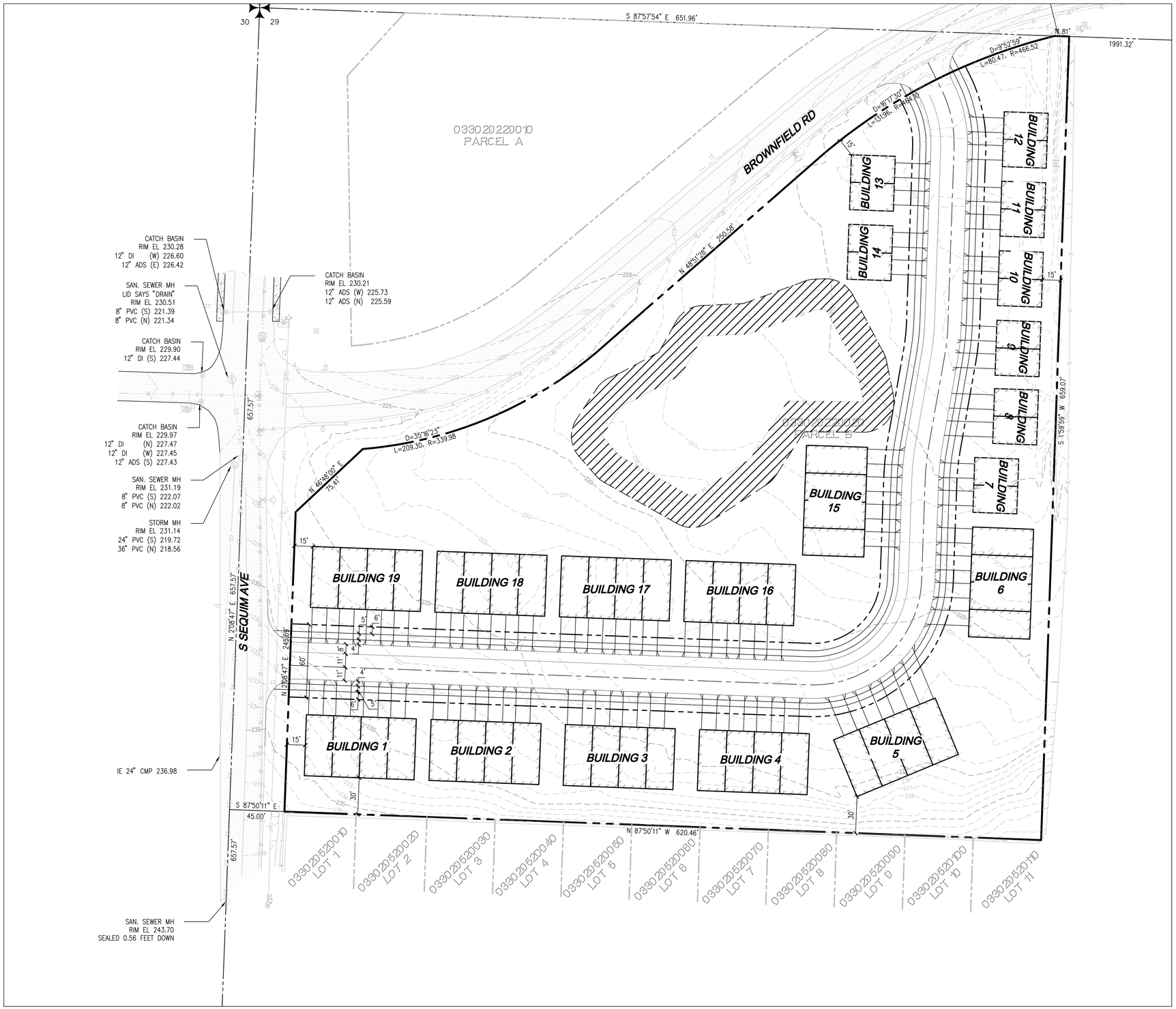
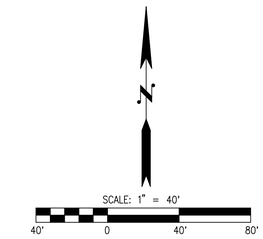


Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized



A PORTION OF SEC 29, TWN 30 N, RGE 3 W, W.M., CLALLAM COUNTY, WASHINGTON





LEGEND

- PROPERTY LINE
- PROPOSED BUILDING
- CEMENT CONCRETE SIDEWALK
- CEMENT CONCRETE PAVEMENT
- ASPHALT PAVEMENT
- CONCRETE CURB AND GUTTER
- WETLAND BOUNDARY
- 25' WETLAND BUFFER
- PROPOSED RIGHT-OF-WAY

PROJECT INFORMATION

11 TOWN HOME BUILDINGS (4 UNITS PER BUILDING)
8 DUPLEX BUILDINGS (2 UNITS PER BUILDING)
60 TOTAL UNITS
6.66 ACRE PROPERTY

LEGAL DESCRIPTION:
(PER STATUTORY WARRANTY DEED 2022-1441294)
PARCEL B OF CLAN MURPHY SHORT PLAT RECORDED SEPTEMBER 19, 2019 IN VOLUME 35 OF SHORT PLATS, PAGE 71, UNDER CLALLAM COUNTY RECORDING NO. 2019-1384656, LOCATED IN THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER, SECTION 29, TOWNSHIP 30, RANGE 3 WEST, W.M. CLALLAM COUNTY, WASHINGTON.

ZONING: R4-8 (CITY OF SEQUIM)
ZONING STANDARDS (PER SMC 18.20.050):
MINIMUM SETBACKS: 15' FRONT
6' SIDE
15' REAR
MAXIMUM BUILDING HEIGHT: 25'
MAXIMUM LOT COVERAGE: 50%
PARKING REQUIRED: 2 SPACES PER UNIT

LOCAL STREET: 34' PAVEMENT, 60' ROW
60' ROW BREAKDOWN: 4' PLANTER ON BOTH SIDES
8' PARKING LANE ON ONE SIDE
5' SIDEWALK ON BOTH SIDES
22' TRAVEL LANE (11' EACH WAY)
5.5' BUFFER ON EACH SIDE BETWEEN SIDEWALK
AND PROPERTIES

IMPORTANT PROJECT NOTES:
ATTACHED RESIDENCES IN THE R4-8 ZONE REQUIRE AN ACUP (ADMINISTRATIVE CONDITIONAL USE PERMIT) IN LIEU OF DESIGN REVIEW (SEE SMC 18.60)

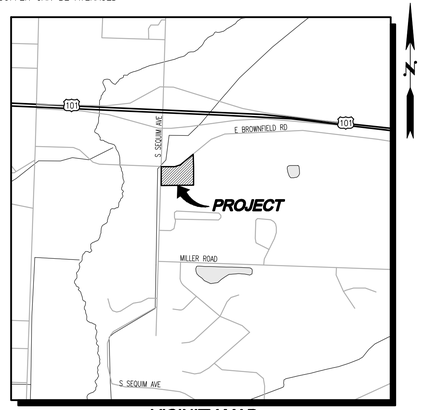
EACH TOWN HOME BUILDING WILL HAVE 4 UNITS EACH WITH TOTAL DIMENSIONS 90'x50'
20' DRIVEWAY

EACH DUPLEX HOME BUILDING WILL HAVE 2 UNITS EACH WITH TOTAL DIMENSIONS 44'X36'
20' DRIVEWAY

24 BUILDINGS MAX (BASED ON FOURPLEX LOT SIZE WITHIN CODE, 12,000 SF PER BUILDING)

APPROXIMATELY 260,000 SF OR 6.66 ACRES

DRAINAGE FACILITY: CAN BE INSIDE OUTER 25% OF WETLAND BUFFER (PER SMC 18.80.080(E))
BUFFER CAN BE AVERAGED



VICINITY MAP
SCALE: 1"=750'

REVISIONS		
NO.	DATE	DESCRIPTION

LDC
Surveying
Engineering
Planning
Kent
18511 Central Pl S, #101
Kent, WA 98030
T 425.806.1869
Woodinville
20210 142nd Avenue NE
Woodinville, WA 98072
www.LDCcorp.com
F 425.482.2893

HABITAT FOR HUMANITY

BROWNFIELD RD DEVELOPMENT

TYRELL E. BRADLEY
STATE OF WASHINGTON
21855
REGISTERED
PROFESSIONAL ENGINEER
PRELIMINARY

JOB NUMBER:	C22-272
DRAWING NAME:	
DESIGNER:	TB
DRAFTING BY:	EO
DATE:	
SCALE:	AS NOTED
JURISDICTION:	SEQUIM

SHEET OF

Drawing: P:\Civil\2022\C22-272 Habitat for Humanity Brownfield Rd\Drawings\Exhibits\Concept Site Plans\C22272-X-PBASE concept 3.dwg Plotted: May 02, 2023 - 3:39pm

INTERSECTION CONTROL EVALUATION REPORT

US 101 and S Sequim Avenue
Sequim, Washington

24 July 2023

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Olympic Region
Lacey, Washington

1. This Intersection Control Evaluation (ICE) Report, under my direct supervision, has been prepared in accordance with appropriate Washington State Department of Transportation manuals and current design guidelines and procedures.



Signed:

Brian Kellogg, PE, PTP, PTOE

DKS Associates

Brian Kellogg

24 July 2023

2. Approved By:

_____, PE Date:_____

Olympic Region Traffic Engineer

3. Concurrence By:

_____, PE Date:_____

State Traffic Design & Operations Manager

US 101 & S SEQUIM AVENUE: INTERSECTION CONTROL EVALUATION

DATE: May 26, 2023

TO: Austin Wagner, Katie Cole | City of Sequim, WA

FROM: Jerry Liu, Brian Kellogg, Peter Yu, Caleb Trapp, Kevan Kanten, and Rebecca Snellings | DKS Associates

SUBJECT: US 101 & S Sequim Ave ICE: Submittal for WSDOT approval

This memo documents the full Intersection Control Evaluation (ICE) for the US 101 and S Sequim Avenue interchange in Sequim, WA. It follows the full five-step process for performing an ICE, per Chapter 1300 of the WSDOT Design Manual—published by the Washington State Department of Transportation (WSDOT). An ICE is required for any WSDOT facility that will be modified; it must include a roundabout alternative. For this interchange, both the eastbound and westbound ramp termini were evaluated for signalization and roundabout alternatives.

STEP 1: BACKGROUND AND PROJECT NEEDS

The US 101 and S Sequim Avenue interchange experiences congestion at its south ramp terminal (eastbound off-ramp approach). With the expected growth in the area, which includes multiple housing developments planned along E Brownfield Road, this congestion is expected to worsen for vehicles that access US 101 at this location. It will also increase potential safety hazards for pedestrians and bicyclists that use the US 101 overpass. To improve safety and operations, the City of Sequim—in conjunction with WSDOT—wishes to evaluate signalization and roundabout alternatives to replace the interchange's existing stop control. The chosen alternative will depend on four primary metrics: safety performance, vehicular traffic operations (based on control delay and level of service), multimodal facilities, and construction costs and impacts (covered only at a high level in this memo).

This section describes the interchange's existing site conditions and traffic volumes, planned housing developments and generated traffic volumes, and background traffic growth. It also includes forecasted traffic volumes for a 2025 design year and a 2045 horizon year during the AM (morning), MD (midday), and PM (afternoon) peak periods.

EXISTING SITE CONDITIONS

US 101 is a primary connection between Port Angeles, Sequim, and Olympia, providing the primary access to Olympic National Park. WSDOT classifies US 101 as a two-lane principal arterial that passes east-west through Sequim. At its interchange with S Sequim Avenue, US 101 has a posted speed limit of 55 mph.

S Sequim Avenue serves as a main gateway to the city of Sequim from US 101 and is classified by WSDOT as a two-lane minor urban arterial. It has a posted speed limit of 30 mph. The interchange is a diamond interchange with stop-controlled off-ramp approaches, a 415-foot spacing between ramp termini, and channelization from pavement markings. Dedicated pedestrian and bicycle facilities exist on each side of S Sequim Avenue.

S Sequim Avenue has an average daily traffic (ADT) of about 7,800 vehicles at the SR 101 interchange. The westbound off-ramp has an ADT of about 2,200 vehicles, while the eastbound off-ramp has an ADT of about 3,700 vehicles. The interchange also experiences a high percentage of heavy vehicles; roughly 12% of the ADT on S Sequim Avenue is heavy vehicle traffic. Approximately 18% of the westbound off-ramp ADT and 13% of the eastbound off-ramp ADT consist of heavy vehicle traffic.

EXISTING TRAFFIC VOLUMES

Turning movement counts were collected at both ramp termini and the adjacent S Sequim Avenue and E Brownfield Road intersection. Counts were collected on Tuesday, August 2, 2022, during the AM peak period (7:00 AM–9:00 AM), Midday peak period (11:00 AM–1:00 PM), and PM peak period (4:00 PM–6:00 PM). Tube counts were collected on S Sequim Avenue and both US 101 off-ramps to conduct the traffic signal warrant analyses and validate the turning movement count data. Those counts were collected over a 72-hour period from Tuesday, August 2, to Thursday, August 4, 2022.

Existing year peak hour volumes for the AM, Midday, and PM peaks are shown in Figure 1. Turning movement count data is provided in **Appendix A**.

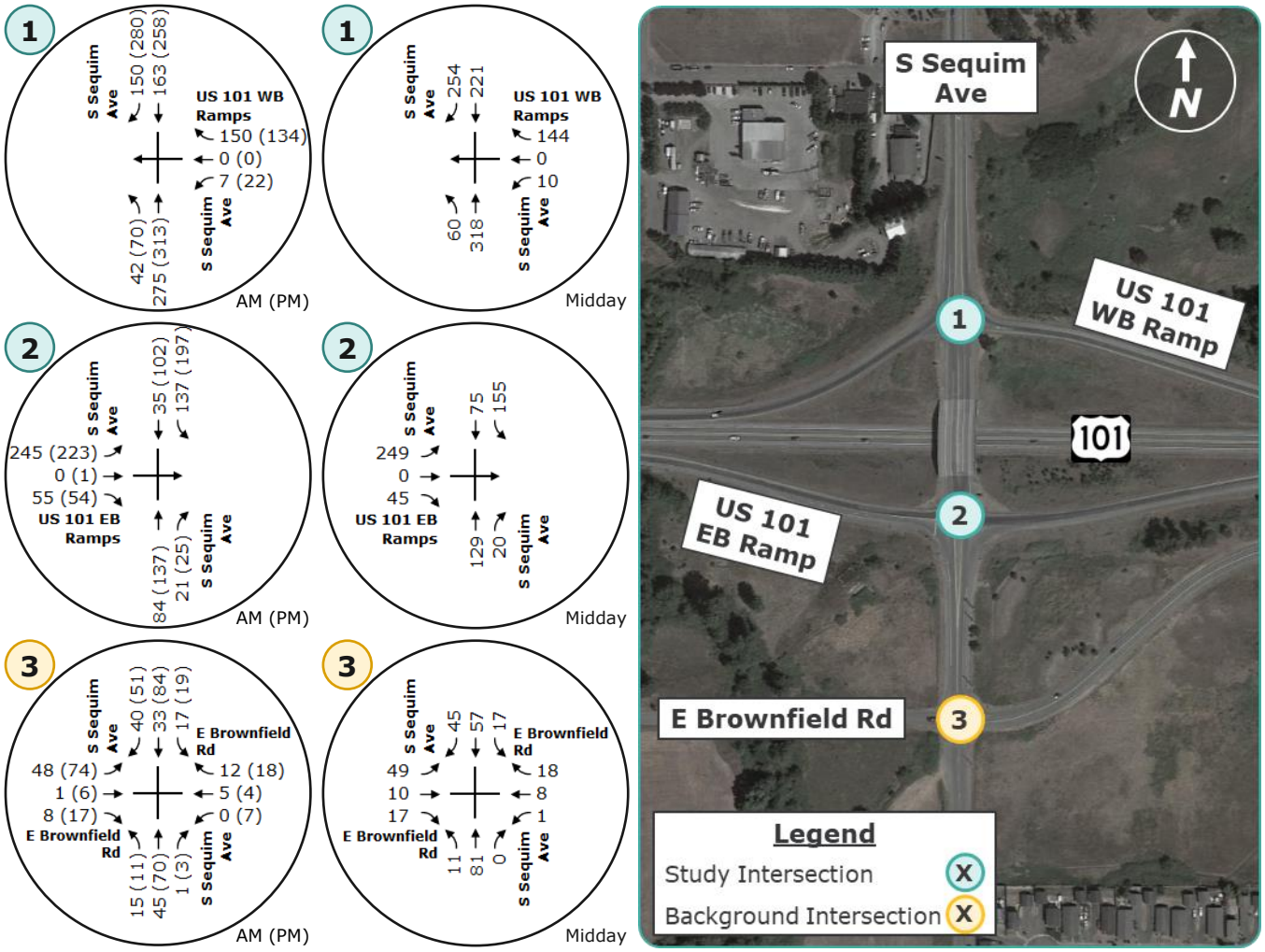


FIGURE 1: EXISTING YEAR (2022) PEAK HOUR VOLUMES (AM, PM, & MIDDAY)

BACKGROUND TRAFFIC GROWTH

GROWTH RATES APPLIED TO TRAFFIC COUNTS

Background growth rates were evaluated based on past traffic impact studies done in the vicinity of the study area, which generally ranged from 1.2% to 2% per year. Based on these studies and discussions with the City of Sequim, the following growth rates were applied to existing traffic counts:

- 2% per year (compounded annually): used from 2022 to 2025 (opening year)
- 1.2% per year (compounded annually): used from 2025 to 2045 (horizon year)

BACKGROUND SITES

Future expected development was included in the forecasts for traffic volumes separately from the background growth. Each development was assumed to be completed by the design year (2025) for this analysis. The background sites include the following:

- **Bell Hill Estates** (TIA submitted in December 2016): includes 100 single-family homes to be located along E Brownfield Road to the east of the study area.
- **Foothills Subdivision** (TIA submitted in January 2020): includes 85 single-family homes immediately to the southwest of the S Sequim Avenue and E Brownfield Road intersection.
- **Rolling Hills Plat** (TIA submitted in March 2022): includes 225 single-family homes to the southeast of the S 7th Avenue and W McCurdy Road intersection.

These background TIAs projected site trips for only the PM peak hour. ITE's Trip Generation Manual was used to estimate AM and Midday peak hour trips for these sites. It includes time-of-day distribution estimates for various land uses, including single-family housing. These distribution estimates separated site trips by entering and exiting trips and were used to create site trip forecasts for each studied peak period. The resulting site trip forecasts from the three future developments listed above are shown in Figure 2 for the AM, Midday, and PM peak hours.

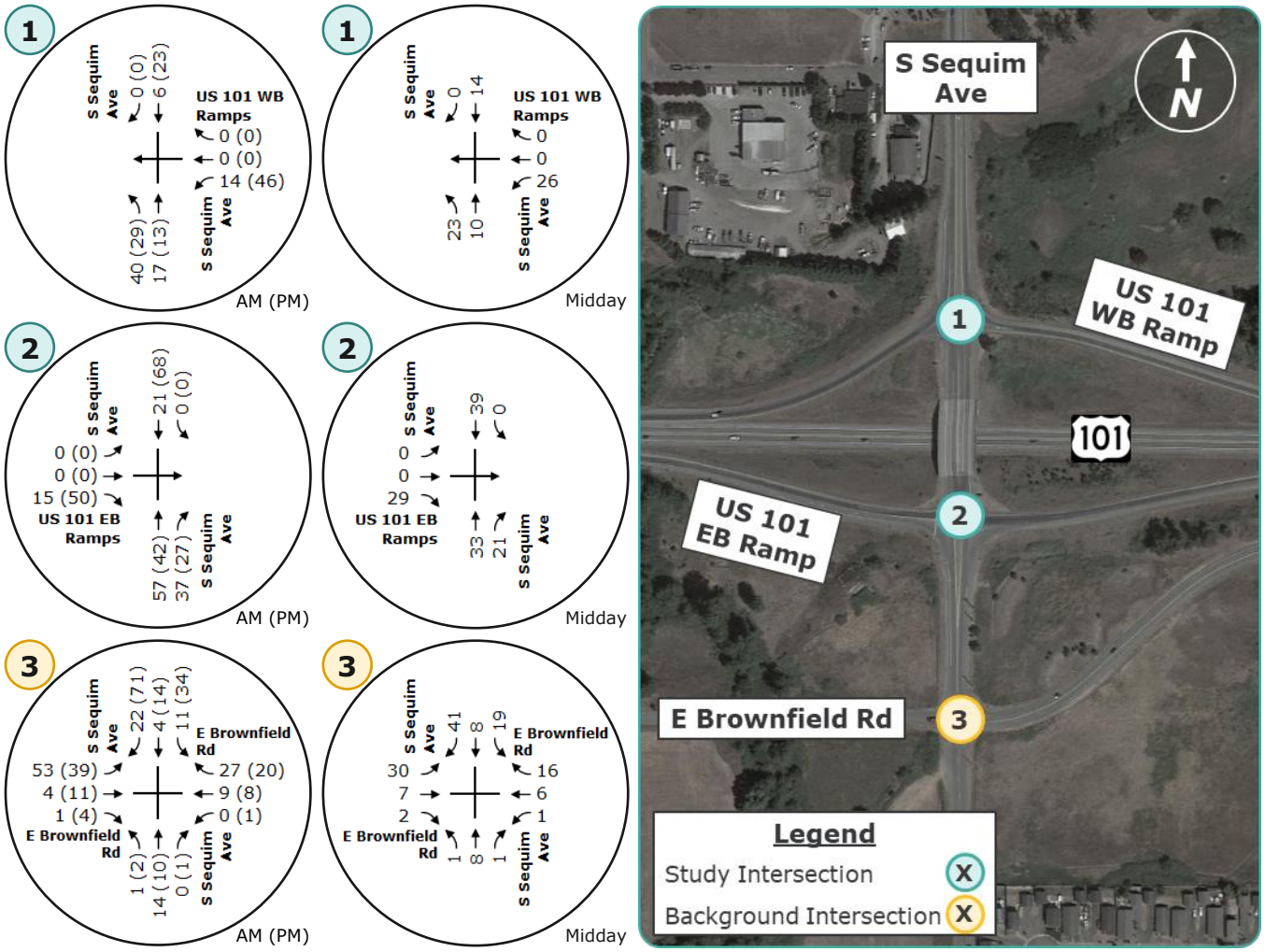


FIGURE 2: BACKGROUND SITE TRIPS (AM, PM, & MIDDAY)

SIMDARS ROAD INTERCHANGE

The US 101 and Simdars Road interchange (located roughly 1.5 miles east of S Sequim Avenue) is currently a half interchange with ramps connecting to/from US 101 to the east. Future plans for the interchange include the potential build-out of ramps on its west side. A WSDOT study included this interchange build-out in a list of potential area improvements in a June 2022 report[1]. However, the full interchange build-out study did not include traffic volume projections for future ramps. It also did not include possible impacts to the US 101 and S Sequim Avenue interchange.

With the build-out of the US 101 and Simdars Road interchange, it is presumed the added ramps would siphon some traffic away from S Sequim Avenue. Because of the lack of traffic forecasting

[1] Source: WSDOT Olympic Region, Multimodal Planning Office. "US 101 East Sequim Pre-Design Study". June 2022.

data and a desire to maintain a more conservative (higher volume) traffic forecast, this analysis does not consider any projects near Simdars Road.

FUTURE FORECASTED TRAFFIC VOLUMES

The forecasted traffic volumes for the 2025 opening year are shown in Figure 3, with 2045 horizon year volumes shown in Figure 4. These forecasts include the grown traffic counts and volumes from the nearby background sites.

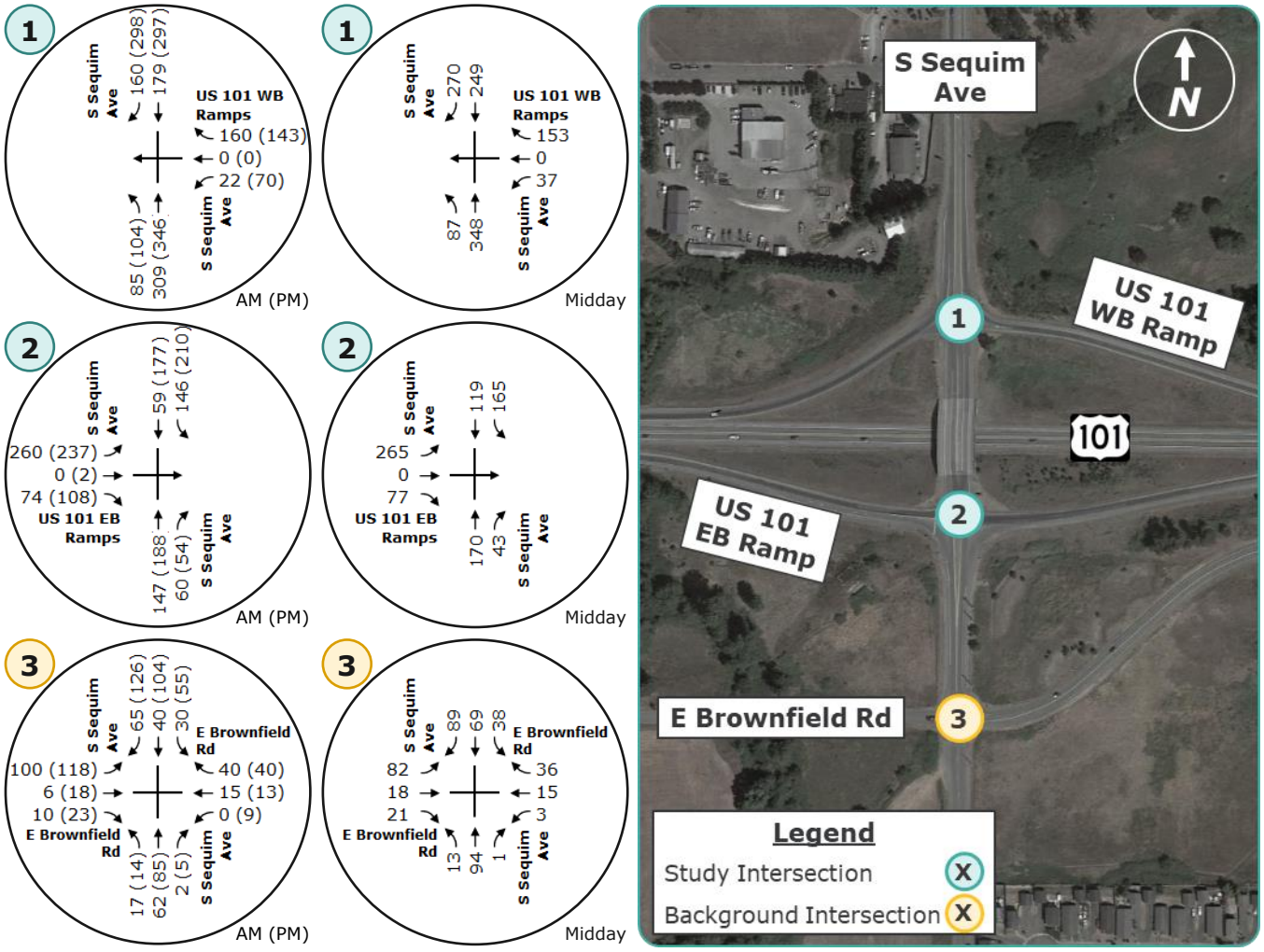


FIGURE 3: OPENING YEAR (2025) PROJECTED PEAK HOUR VOLUMES (AM, PM, & MIDDAY)

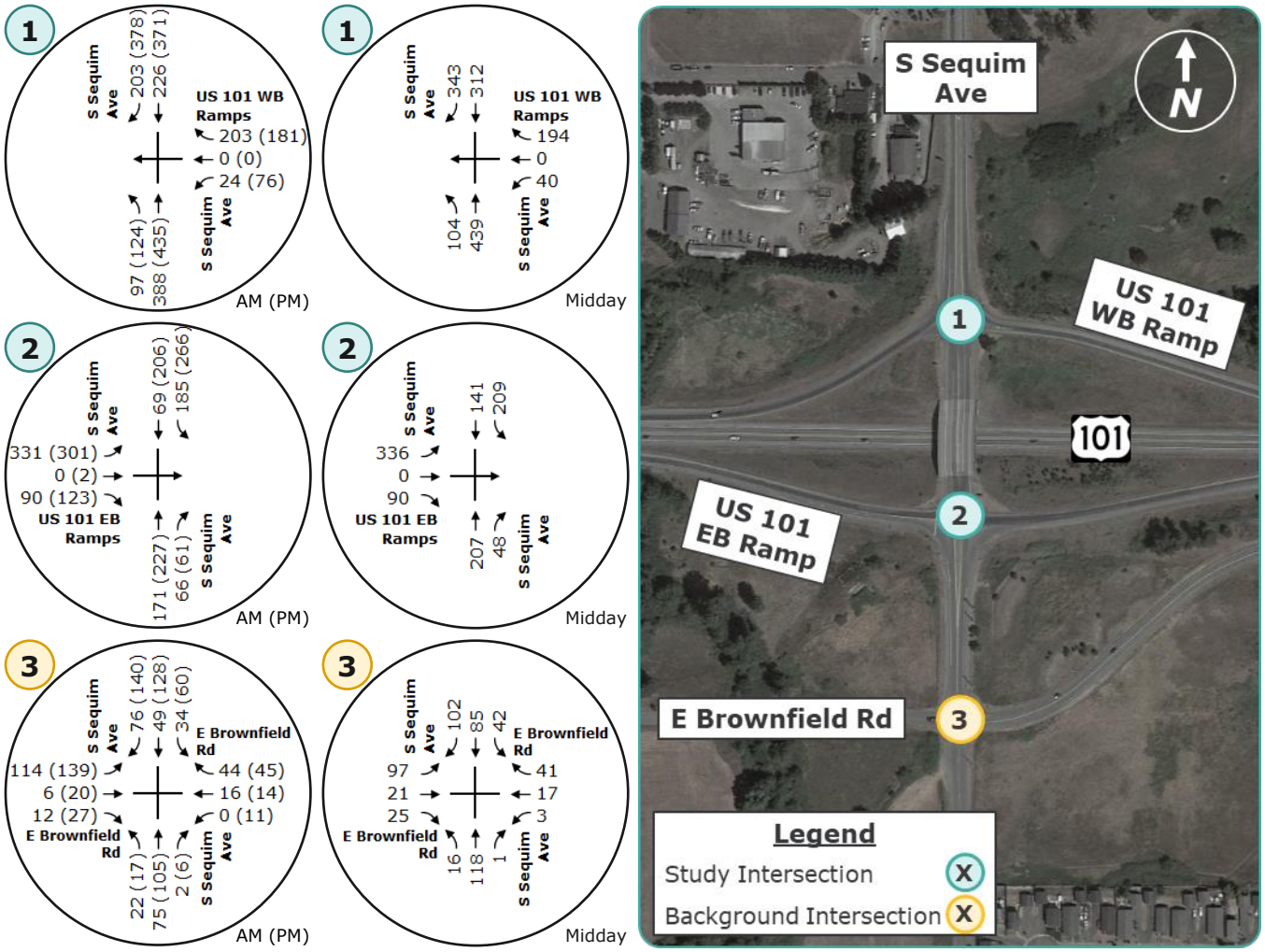


FIGURE 4: HORIZON YEAR (2045) PROJECTED PEAK HOUR VOLUMES (AM, PM, & MIDDAY)

EVALUATED INTERSECTION ALTERNATIVES

With projected traffic demands at the interchange, nearby future developments, and goals of safe and efficient operations to/from US 101 and safe walking and cycling along S Sequim Avenue, two intersection alternatives were carried forward for evaluation: **Signalization** and **Roundabout**. The signalization alternative largely keeps the interchange's existing lane configuration. The roundabout alternative is analyzed as a pair of single-lane teardrop roundabouts, each with a 130-foot circulatory roadway diameter without slip lanes.

STEP 2: FEASIBILITY

A field visit to the US 101 and S Sequim Avenue interchange was made during the PM peak period to observe traffic and the existing interchange geometry. This visit included measuring lane widths, sidewalks, and distances from both ramp termini to the overpass. During the visit, steep downhill grades were noted outside the paved area on the interchange's north side. This note indicates the need for heavier grading to expand the paved area. By comparison, milder grades outside of the traveled way to the south of the interchange indicate the need for less earthwork and grading on that side.

For each alternative, a sketch design was prepared to gauge the amount of new pavement needed, space requirements, and potential locations for elements such as signal poles and cabinets. The signalization alternative is shown in Figure 5, while the roundabout alternative is shown in Figure 6. Larger versions of these layouts are provided in **Appendix B**.

As shown in the sketch designs, the added footprint of the roundabout would likely require significant grading work, additional pavement, and potentially retaining walls. The signalization option would require minimum earthwork, likely only requiring pavement for new curb ramps at both intersections. The US 101 and River Road interchange to the west is signalized with similar geometry and terrain and thus would compare similarly regarding maintenance.

Based on the sketch layouts for both alternatives and observations made during the field visit, both alternatives were considered feasible for the interchange and carried on for additional safety and operational analyses. An accurate assessment of the total costs of each option would require further survey and design work, as well as a formal cost estimate, which was not included in this ICE.



FIGURE 5: SIGNALIZATION ALTERNATIVE SKETCH LAYOUT



FIGURE 6: ROUNDABOUT ALTERNATIVE SKETCH LAYOUT

STEP 3: OPERATIONAL AND SAFETY PERFORMANCE ANALYSIS

TRAFFIC OPERATIONS PERFORMANCE

The macroscopic traffic analysis software Synchro 11 was used to conduct analyses of the existing stop-controlled interchange, signalization alternative, and E Brownfield Road intersection. Sidra Intersection 9—another macroscopic traffic analysis software—was used to conduct analyses of the roundabout alternative. The existing interchange and E Brownfield Road intersection were analyzed for existing and future no-build conditions. By comparison, both the signalization and roundabout alternatives were analyzed for only the design and horizon years. All analyses followed WSDOT's Synchro & SimTraffic Protocol and Sidra Policy Setting.

For the study area, both the City of Sequim[2] and WSDOT[3] maintain a standard of Level of Service (LOS) "D". LOS thresholds are based on average control delay for intersections and are a measure of the perceived quality of operations of a given facility.

Results highlighting each intersection's control delay (seconds/vehicle) and LOS are shown in the tables below. The full Synchro and Sidra reports can be found in **Appendix C**.

The no-build results, which use the interchange's existing stop control, are shown in Table 1,

Table 2, and Table 3 for the AM peak hour, Midday peak hour, and PM peak hour, respectively. These results show that the eastbound off-ramp approach is projected to face heavy congestion during all peak periods, especially during the Midday and PM peak periods. Queues on this approach would risk extending toward the off-ramp gore point, which would create potential safety issues along US 101. For the S Sequim Avenue and E Brownfield Road intersection, traffic operations are expected to remain adequate. Queue spillback between that intersection and the US 101 interchange is not expected during any of the future scenarios analyzed.

[2] City of Sequim. "Comprehensive Plan 2015-2035". See TR 4.3.8.

[3] Washington State Department of Transportation. "WSDOT Design Manual M 22-01.21". See Section 320.05.

TABLE 1: TRAFFIC OPERATIONS RESULTS – NO-BUILD, AM PEAK HOUR

INTERSECTION	MOVEMENT / APPROACH	2022 EXISTING YEAR		2025 DESIGN YEAR		2045 HORIZON YEAR	
		DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS
S SEQUIM AVE & US 101 WB RAMPS	NB-Left	8	A	8	A	9	A
	WB	12	B	12	B	13	B
S SEQUIM AVE & US 101 EB RAMPS	SB-Left	8	A	8	A	8	A
	EB	26	D	**50**	**F**	**55**	**F**
S SEQUIM AVE & E BROWNFIELD RD	NB-Left	8	A	8	A	8	A
	SB-Left	7	A	8	A	8	A
	EB	11	B	14	B	13	B
	WB	9	A	10	A	10	A

TABLE 2: TRAFFIC OPERATIONS RESULTS – NO-BUILD, MIDDAY PEAK HOUR

INTERSECTION	MOVEMENT / APPROACH	2022 EXISTING YEAR		2025 DESIGN YEAR		2045 HORIZON YEAR	
		DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS
S SEQUIM AVE & US 101 WB RAMPS	NB-Left	9	A	9	A	9	A
	WB	11	B	11	B	13	B
S SEQUIM AVE & US 101 EB RAMPS	SB-Left	8	A	8	A	8	A
	EB	**41**	**E**	**86**	**F**	**135**	**F**
S SEQUIM AVE & E BROWNFIELD RD	NB-Left	8	A	8	A	8	A
	SB-Left	7	A	8	A	8	A
	EB	11	B	14	B	14	B
	WB	10	A	10	B	10	B

TABLE 3: TRAFFIC OPERATIONS RESULTS – NO-BUILD, PM PEAK HOUR

INTERSECTION	MOVEMENT / APPROACH	2022 EXISTING YEAR		2025 DESIGN YEAR		2045 HORIZON YEAR	
		DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS
S SEQUIM AVE & US 101 WB RAMPS	NB-Left	9	A	9	A	10	A
	WB	11	B	10	A	11	B
S SEQUIM AVE & US 101 EB RAMPS	SB-Left	8	A	8	A	8	A
	EB	29	D	**55**	**F**	**231**	**F**
S SEQUIM AVE & E BROWNFIELD RD	NB-Left	8	A	8	A	8	A
	SB-Left	7	A	8	A	8	A
	EB	11	B	16	C	18	C
	WB	11	B	11	B	11	B

Table 4 shows the analysis results for the signalization alternative, while Table 5 shows the analysis results for the roundabout alternative. The signalization alternative assumed all permitted left turns from S Sequim Avenue onto the US 101 on-ramps and no changes to existing channelization. The roundabout alternative was analyzed as a pair of single-lane teardrop roundabouts without slip lanes. In both cases, analyses showed low delays and queues during each peak period for both the 2025 design year and 2045 horizon year. Both alternatives are expected to operate well under capacity for all interchange movements.

TABLE 4: TRAFFIC OPERATIONS RESULTS – SIGNALIZATION ALTERNATIVE

PEAK PERIOD	INTERSECTION	2025 DESIGN YEAR		2045 HORIZON YEAR	
		DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS
AM	S Sequim Ave & US 101 WB Ramps	7	A	8	A
	S Sequim Ave & US 101 EB Ramps	9	A	9	A
MIDDAY	S Sequim Ave & US 101 WB Ramps	7	A	8	A
	S Sequim Ave & US 101 EB Ramps	9	A	9	A
PM	S Sequim Ave & US 101 WB Ramps	7	A	8	A
	S Sequim Ave & US 101 EB Ramps	8	A	9	A

TABLE 5: TRAFFIC OPERATIONS RESULTS – ROUNDABOUT ALTERNATIVE

PEAK PERIOD	INTERSECTION	2025 DESIGN YEAR		2045 HORIZON YEAR	
		DELAY (S/VEH)	LOS	DELAY (S/VEH)	LOS
AM	S Sequim Ave & US 101 WB Ramps	4	A	4	A
	S Sequim Ave & US 101 EB Ramps	8	A	7	A
MIDDAY	S Sequim Ave & US 101 WB Ramps	4	A	4	A
	S Sequim Ave & US 101 EB Ramps	7	A	7	A
PM	S Sequim Ave & US 101 WB Ramps	4	A	5	A
	S Sequim Ave & US 101 EB Ramps	6	A	6	A

SIGNAL WARRANT ANALYSIS

A signal warrant analysis based on the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) was conducted for each ramp terminal intersection. As signalization was identified as an alternative control option, the evaluation of signal warrants helps identify if signalization is justified based on quantitative data. Each intersection was analyzed for both existing (2022) and design year (2025) conditions, with an evaluation of the following three warrants:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour

The averages of the mid-week traffic volumes (from August 2 to August 4, 2022) obtained from tube counts (found in **Appendix A**) were used to conduct the signal warrant analyses in Highway Capacity Software (HCS) 7. The full signal warrant analyses for each ramp terminal intersection are included in **Appendix D**.

Table 6 shows that both ramp terminals meet Warrants 1 and 2 for existing year (2022) conditions. With traffic growth expected for the design year (2025) and horizon year (2045), both intersections would also meet Warrants 1 and 2 for those years. The signal warrant analysis results show that signalization is an appropriate treatment and should be considered for the existing interchange.

TABLE 6: TRAFFIC SIGNAL WARRANT ANALYSIS RESULTS

	MUTCD WARRANT	S SEQUIM AVE & US 101 WB RAMPS		S SEQUIM AVE & US 101 EB RAMPS	
	Analysis Year:	*2022 Existing*	*2025 Opening*	*2022 Existing*	*2025 Opening*
#1	Eight-Hour Vehicular Volume	Met	Met	Met	Met
#2	Four-Hour Vehicular Volume	Met	Met	Met	Met
#3	Peak Hour[a]	*Not Met*	*N/A*	*Threshold Met*	*Threshold Met*

[a] The Peak Hour Warrant is to be applied only at locations that attract or discharge large numbers of vehicles over a short time. The US 101 & S Sequim Ave interchange does not meet this criterion, so this warrant is provided for only reference.

SAFETY ANALYSIS

The most recent crash history for the US 101 and S Sequim Ave interchange is summarized below in Table 7 and Table 8. The data is summarized from January 1, 2017 through December 31, 2021.

TABLE 7: US 101 WB RAMPS & S SEQUIM AVE EXISTING CRASH TYPES AND SEVERITY

CRASH TYPE	FATAL	INJURY	PROPERTY DAMAGE ONLY	TOTAL
ANGLE (LEFT TURN)	0	1	0	1
REAR END	0	1	5	6
GRAND TOTAL	**0**	**2**	**5**	**7**

TABLE 8: US 101 EB RAMPS & S SEQUIM AVE EXISTING CRASH TYPES AND SEVERITY

CRASH TYPE	FATAL	INJURY	PROPERTY DAMAGE ONLY	TOTAL
ANGLE	0	2	0	2
REAR END	0	0	1	1
FIXED OBJECT	0	1	1	2
GRAND TOTAL	**0**	**3**	**2**	**5**

The crash history indicates that the study period had 12 crashes, with no fatal or serious injury crashes. Seven crashes occurred at the WB ramp terminal intersection, six of which were rear-end. Five crashes occurred at the EB ramp terminal intersection, including two injury crashes caused by angle crashes.

Both alternatives would grant safety benefits to the study location. To measure the safety benefits each alternative would provide, Crash Modification Factors (CMFs) were taken from WSDOT's CMF Short List for the conversion of a stop-controlled intersection to a roundabout, while the FHWA's CMF Clearinghouse provided information for installing a traffic signal, as shown in Table 9.

TABLE 9: CRASH MODIFICATION FACTORS FOR FATAL/INJURY CRASHES

COUNTERMEASURE	FATAL & ALL INJURY
INSTALL A TRAFFIC SIGNAL	0.77[A]
CONVERT STOP-CONTROLLED INTERSECTION TO A SINGLE-LANE ROUNDABOUT	0.22[B]

[A]SOURCE: CMF CLEARINGHOUSE, CMF #319
[B]SOURCE: WSDOT CMF SHORTLIST

Installation of a traffic signal would provide a CMF of 0.77 for fatal/injury crashes, or a predicted reduction of 23%. Conversion of a minor road stop-controlled intersection to a single-lane roundabout would provide CMF of 0.22 for fatal/injury crashes, or a predicted crash reduction of 78%.

Overall, both options would be expected to improve safety operations at the interchange. Conversion to a single-lane roundabout shows a large potential drop in the likelihood of fatal/injury crashes by reducing the number of conflict points and changing the types of conflicts. A roundabout ramp terminal prevents entering-at-angle and left-turn movements since vehicles can only turn right when entering and exiting the roundabout. Crossing-related crashes are associated with higher severe injury risks. The presence of a roundabout also encourages vehicles to reduce operating speed when approaching and while in the roundabout, which has also been shown to reduce crash severity.

MULTIMODAL SAFETY AND OPERATIONS

With existing sidewalks and bicycle facilities along each side of S Sequim Avenue, both alternatives must safely and efficiently facilitate movements that cross US 101. For the signalized alternative, a crosswalk on each approach at each ramp terminal intersection was provided, with concurrent pedestrian phases included in the respective signal timings. Left turns from S Sequim Avenue onto the US 101 on-ramps were considered as permitted movements. They could, however, use exclusively protected phasing or a ped-negative timing to enable fewer conflicts between turning vehicles and pedestrians and bicyclists. Bicyclists would move along S Sequim Avenue alongside the respective north-south vehicle phases.

Each roundabout would use bicycle ramps to allow bicyclists to exit the bike lane upstream of the roundabout and cross on crosswalks. With a crosswalk to be placed on each approach, pedestrians

and bicyclists would have the right-of-way when crossing the approach or departure roadway of each roundabout.

STEP 4: ALTERNATIVES EVALUATION

The metrics used to evaluate the signalization and roundabout alternatives for the interchange are shown in Table 10. A summary of which alternative performs better under each metric is included. The roundabout alternative outperforms the signalization alternative in both vehicular operations (albeit very slightly) and safety, while the signalization alternative involves less costs and impacts. Both options would also adequately facilitate pedestrians and bicyclists.

TABLE 10: PERFORMANCE SUMMARY OF EVALUATED INTERSECTION ALTERNATIVES

	SIGNALIZATION	ROUNDABOUT
OPERATIONS PERFORMANCE	✓ (both) Both options would result in LOS A at each intersection into the 2045 horizon year. The roundabout performs slightly better than signalization.	
SAFETY PERFORMANCE	Significantly reduces the number of angle and left-turn crashes. However, rear-end crashes will increase.	✓ Fewer predicted injury crashes than with signalization
MULTIMODAL FACILITIES	✓ (both) Both options would provide adequate pedestrian facilities and retain the bike lanes along S Sequim Ave	
COST/IMPACT	✓ Main costs include the installation of a new traffic signal system, ADA curb ramps, and operations/maintenance costs	Significant grading, retaining walls, and new pavement would be required at both intersections. Additional stormwater drainage facilities may be required due to added impervious pavement areas.

STEP 5: SELECTION

Based on the analyses documented in this ICE, the eastbound off-ramp approach at the Sequim Avenue interchange at US 101 is operating in LOS D today, and all other interchange approaches operate at LOS A or B. As the traffic volume grows, the eastbound off-ramp approach will face heavy congestion and operate in LOS F in 2025 and beyond with the current stop-controlled intersection. Extensive queues could build up on the eastbound off-ramp approach and create potential safety issues along US 101.

Both the signalization and roundabout alternatives would improve safety and operational performance for the US 101 and S Sequim Ave interchange. All peak periods in both design and horizon years will operate at LOS A. The roundabout would provide better safety performance, including a greater reduction in severe crashes.

The main disadvantage of the signalization alternative is the regular maintenance of signal equipment required at each ramp terminal intersection. The roundabout alternative would likely require grading, retaining walls, and additional pavement at both ramp terminals. The increase in impervious pavement may also result in additional stormwater drainage requirements for the roundabout alternative. Further analysis during the detailed design process would provide more detailed impacts and cost estimates for the roundabout alternative.

In summary, both alternatives are feasible and provide excellent service over the existing stop-control for the interchange into the horizon year. Each alternative would provide significant safety and operational benefits. The exact cost and environmental impacts for either option would require further analysis and design beyond the sketch design work done for this ICE.

Based on the analysis documented in this ICE, while both alternatives would be feasible and an improvement over existing traffic control, the preferred intersection alternative for the US 101 and S Sequim Avenue interchange is single-lane roundabouts at both ramp terminals, due to the roundabout's ability to mitigate severe, injury-causing crashes through reducing vehicle speeds and the number of intersection conflict points.