

Harbour Reach Drive Ext

Supplemental Transportation Analysis

Blue Heron Blvd/Harbour Reach Drive

May 4, 2017

CITY OF MUKILTEO



Prepared By:

LOCHNER

H.W. Lochner, Inc.
915 118th Avenue SE
Suite 130
Bellevue, WA 98005
(425) 454 - 3160

www.hwlochner.com

Harbour Reach Drive from Harbour Pointe Blvd N to Beverly Park Rd Supplemental Traffic Analysis for Blue Heron Blvd/Harbour Reach Drive City of Mukilteo, WA

1. Introduction

Background

In 2015, as part of the Harbour Reach Drive Extension project, the City of Mukilteo proposed a traffic signal control system at the reconfigured Blue Heron Blvd and Harbour Reach Drive intersection. The traffic signal system would help reduce excessive delay for trucks exiting Travis Industries by providing gaps for left turns onto the Harbour Reach Drive during peak hours. The Travis Industries facilities access is the east leg of the proposed Harbour Reach Drive Extension and Blue Heron Blvd intersection. However, following a traffic study conducted by Lochner, the traffic signal system may not be warranted at the time of project completion due to forecasted low traffic volumes on both Harbour Reach Drive and Blue Heron Blvd.

This supplement looks at the operation of Two-Way Stop-Control (TWSC) alternative operation for the 2018 opening and 2040 design year. This alternative assumes stop sign controls will be installed at east and west approaches of the intersection and left turn pockets will be installed for all four approaches with the completion of the Harbour Reach Drive Extension project. A traffic simulation was conducted to examine the future truck operations, and especially to verify that there will be frequent gaps of sufficient length of time to accommodate large trucks turning onto Harbour Reach Drive from the Travis Industries entrance (east leg) during the peak hours.

2. Existing Conditions

Blue Heron Blvd is a local 28-foot wide road between curbs with one lane in each direction. It is a major truck route connecting Travis Industries facilities to Harbour Pointe Blvd SW. To the west, Blue Heron Blvd also functions as the local street for a small community located west of Harbour Pointe Blvd. The posted speed is 25 MPH.

3. Data Collection

Existing and Forecast Traffic Volumes

Since Blue Heron Blvd is not intersecting existing Harbour Reach Drive, no traffic counts are collected.

Forecast Traffic Volumes

With the completion of Harbour Reach Drive Extension Project, Blue Heron Blvd will intersect Harbor Reach Drive at about 650' south of Harbour Pointe Blvd SW/Harbour Reach Drive intersection. The forecasted volumes for opening year (2018) and design year (2040) are shown in Table 2.

Table 1: Forecast AM and PM Peak Hour Intersection Turning Movement Summary

Year	Peak Hour	Peak Hour Factor	Approach											
			Eastbound			Northbound			Westbound			Southbound		
			Left	Thru	RT	Left	Thru	RT	Left	Thru	RT	Left	Thru	RT
2018	AM	0.92	5	5	8	5	32	5	5	5	5	5	72	5
2018	PM	0.92	5	5	10	5	41	5	5	5	5	5	92	5
2040	AM	0.92	5	5	32	5	128	5	5	5	5	5	228	5
2040	PM	0.92	5	5	40	5	160	5	5	5	5	5	360	5

4. Intersection Analysis

Design and Analysis Assumptions

The following criteria and assumptions were used for the analysis and design in this report:

- Opening Analysis Year = 2018
- Future Design Year = 2040
- Future peak hour factor: 0.92
- Future Heavy Vehicle Percentage: 90% on Blue Heron Blvd west approach, and 5% on others.
- HCM 2010 edition methodology

Methodology

The following software and analyses were used to perform the intersection analysis:

- Level of Service analysis: Synchro 9.1 for the level of service analysis (see Appendix A)
- Gap analysis: SimTraffic was used to visually confirm the gap availability for the trucks and to determine the average delay for the trucks (see Appendix B).

5. Intersection Analysis Summary

The software programs provide analysis based on the methodologies presented in the *Highway Capacity Manual* (HCM). The delay and LOS results for 2018 and 2040 are summarized in Table 3. Overall, the intersection of Blue Heron Blvd and Harbour Reach Drive experiences a Level of Service B or better in the 2018 opening year and the 2040 future condition.

Table 2: 2018 Peak Hour LOS Summary

Year	Peak Hour	Overall LOS ^{1,2}	Approach			
			EB	WB	NB	SB
2018	AM	9.5/A	9.4/A	9.5/A	0.7/-	0.3/-
2018	PM	10.9/B	10.2/B	10.9/B	1.5/-	0.3/-
2040	AM	12.7/B	11.6/B	12.7/B	0.2/-	0.1/-
2040	PM	12.7/B	11.6/B	12.7/B	0.2/-	0.1/-

1. Average delay in seconds per vehicle
2. Level of service, based on 2010 Highway Capacity Manual methodology. For TWSC, the intersection LOS is the same as the worst movement LOS.

A vehicle gap availability analysis was performed using SimTraffic modeling software, which simulates traffic by feeding individual vehicles into the network model. For entering the Blue Heron Blvd intersection in the westbound direction, 90% of the vehicles were programmed as heavy vehicles to simulate the Travis Industries truck operations. During the simulation, the individual westbound vehicle was looking for a gap for entering the intersection. These vehicles were observed and the delays were recorded.

Table 4 shows a comparison of the east approach (Travis Industries entrance) delays, stops, and link travel speed for 2018 and for 2040. These values are the average of five model runs. According to the model, the stop delay for the east approach is less than 5 second. This means that a typical truck only needs to wait for less than 5 second for an adequate gap to be available during the peak hours for both 2018 and 2040.

Table 3: 2018 Peak Hour Delay Summary – East Approach (Travis Entrance)

Year	Peak Hour	Delay (second), Stops (each) and Travel Speed (mph)			
		Stop Delay	Total Delay	Stop	Speed
2018	AM	2.9	3.5	1	19
2018	PM	3.3	4.1	1	20
2040	AM	4.9	5.0	1	20
2040	PM	4.2	4.4	1	21

Summary

Overall, the intersection of Blue Heron Blvd and Harbour Reach Drive is predicted to operate at a level of service of B or better in the future conditions with two-way stop controls (TWSC). As traffic simulation models indicated, the east approach of the intersection (Travis Entrance) has a stop delay of less than 5 seconds and the trucks from Travis Industries are expected to experience adequate traffic operations.

APPENDICIES

Appendix A: Synchro Outputs

Appendix B: SimTraffic Outputs