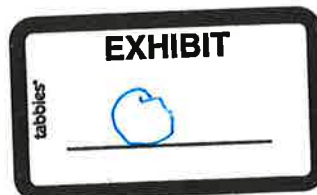


Gibson Traffic Consultants, Inc.
2813 Rockefeller Avenue
Suite B
Everett, WA 98201
425.339.8266

Madrona Ridge Traffic Impact Analysis

Jurisdiction: City of Port Townsend

September 2021



GTC #21-267

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ATTACHMENTS

Channelization AnalysisA

1. INTRODUCTION

Gibson Traffic Consultants, Inc. (GTC) has been retained to analyze the traffic impacts of the proposed Madrona Ridge development. The proposed development is located on the west side of Rainier Street, north of Discovery Road. A site vicinity map is included in Figure 1. The development is proposed to consist of 169 single-family detached units. There is one existing single-family detached unit that will be removed and creditable to the development. The development is anticipated to be fully built by the year 2025.

Matthew Palmer, responsible for this report, is a licensed professional engineer (Civil) in the State of Washington and member of the Washington State section of the Institute of Transportation Engineers (ITE).

2. METHODOLOGY

Trip generation for the Madrona Ridge development is based on average trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition + Supplement (2020)*.

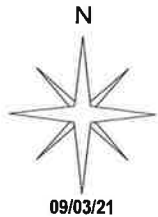
3. TRIP GENERATION

Trip generation calculations for the proposed Madrona Ridge development are based on national research data for land uses contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition + Supplement (2020)*. The average trip generation rates for ITE Land Use Code (LUC) 210, Single-Family Detached, have been utilized for the trip generation calculations. The Madrona Ridge is proposing to construct 169 single-family detached units and will be removing 1 existing single-family detached unit. Therefore, the analysis has been performed for 168 net new single-family detached units. The trip generation of the Madrona Ridge development is summarized in Table 1.

Table 1: Trip Generation Summary

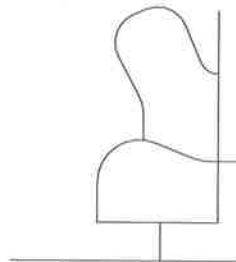
168 New Single-Family Residential Units	Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	9.44 trips per unit			0.74 trips per unit			0.99 trips per unit		
Splits	50%	50%	100%	25%	75%	100%	63%	37%	100%
Trips	793	793	1,586	31	93	124	104	62	166

The Madrona Ridge development is anticipated to generate approximately 1,586 new average daily trips (ADT) with approximately 124 new AM peak-hour trips and approximately 166 new PM peak-hour trips. The trip generation calculations are included in the attachments.



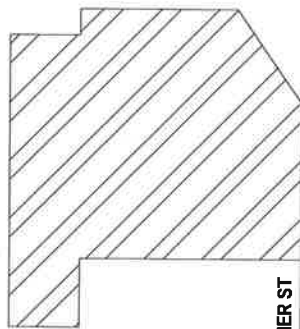
HASTINGS AVE

HOWARD ST



20TH ST

SITE



RAINIER ST

DISCOVERY RD

14TH ST

RAINIER ST

MCPHERSON ST

HOWARD ST

GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #21-267

MADRONA RIDGE
DEVELOPMENT

LEGEND



DEVELOPMENT SITE

FIGURE 1

SITE VICINITY MAP

CITY OF PORT TOWNSEND

4. TRIP DISTRIBUTION

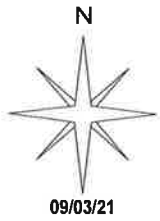
The trip distribution for the Madrona Ridge development is based on surrounding uses and existing traffic volumes. It is anticipated that 45% of the trips generated by the development will travel to and from the north along Discover Road. Approximately 40% of the trips generated by the development will travel to and from the south along Discovery Road. The remaining 15% of the trips generated by the development will travel to and from the south along Rainier Street. Detailed distribution for the PM peak-hour is shown in Figure 2.

5. ACCESS CHANNELIZATION WARRANT

As Rainier Street is a dead-end road with only one single-family located at the end of the roadway and the development would generate the most left-turns into the site during the PM peak-hour, only the PM peak-hour was analyzed for access channelization as it is the most likely peak-hour to require a left-turn lane.

Channelization analysis was performed at the site access onto Rainier Street to determine if left-turn channelization is warranted. The left-turn channelization requirements at the intersection have been evaluated using the WSDOT *Design Manual*. The left-turn channelization has been evaluated using Exhibit 1310-7a *Left-Turn Storage Guidelines: Two-Lane Turn Lane Guidelines*. The analysis shows that a left-turn lane would not be required along Rainier Street at the site access as the volumes do not meet the minimum required by the warrant (300 total trips along the major roadway).

Additionally, the left-turn lane warrant was assessed based on Rainier Street being opened to the development to the north. There are 136 single-family detached units that utilize Howard Street to access Hastings Avenue. With all 136 single-family detached units also traveling past the site access along Rainier Street, a left-turn lane is still not warranted due to a lack of volume.

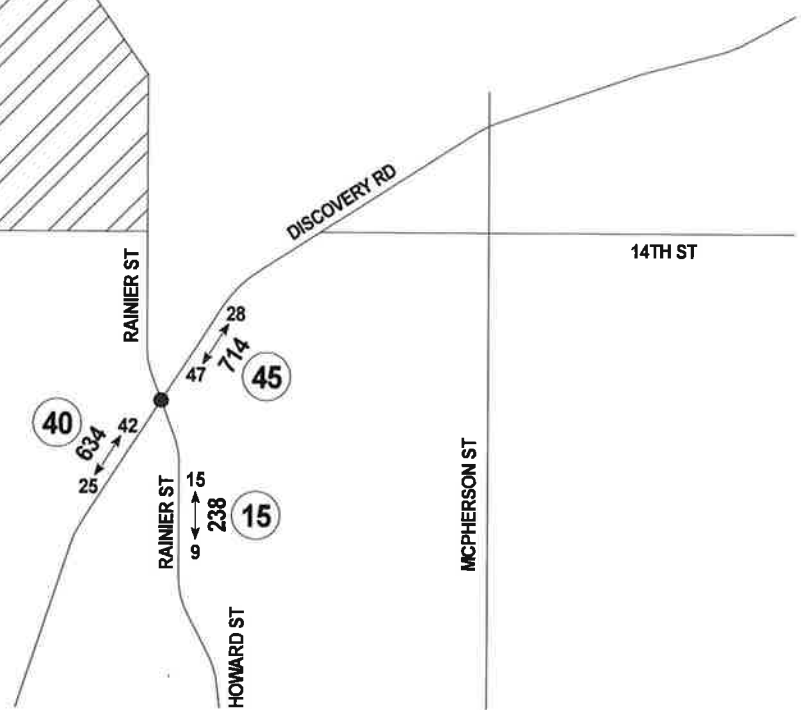
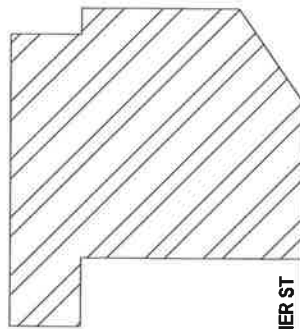


HASTINGS AVE

HOWARD ST

20TH ST

SITE



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #21-267

MADRONA RIDGE
DEVELOPMENT

LEGEND

PM ← ADT → PEAK

NEW SITE TRAFFIC
(PEAK HOUR)



TRIP DISTRIBUTION %

FIGURE 2

**DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR**

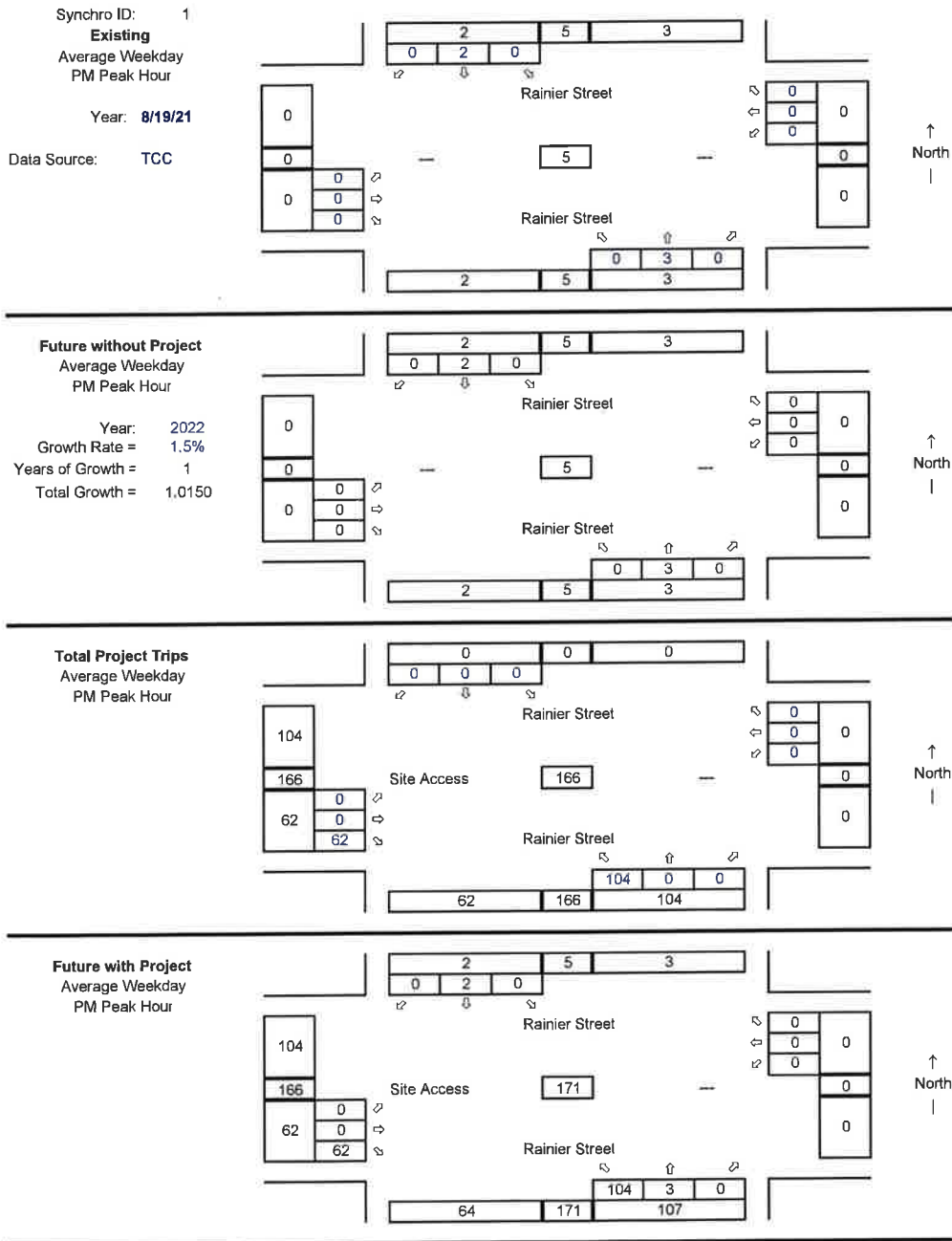
CITY OF PORT TOWNSEND

6. CONCLUSIONS

The proposed Madrona Ridge development is located on the west side of Rainier Street, north of Discovery Road. The development is proposed to consist of 169 single-family detached units and will be removing 1 single-family detached units, resulting in 168 net new single-family detached units. The Madrona Ridge development is anticipated to generate 1,586 new daily trips with 124 new AM peak-hour trips and 166 new PM peak-hour trips.

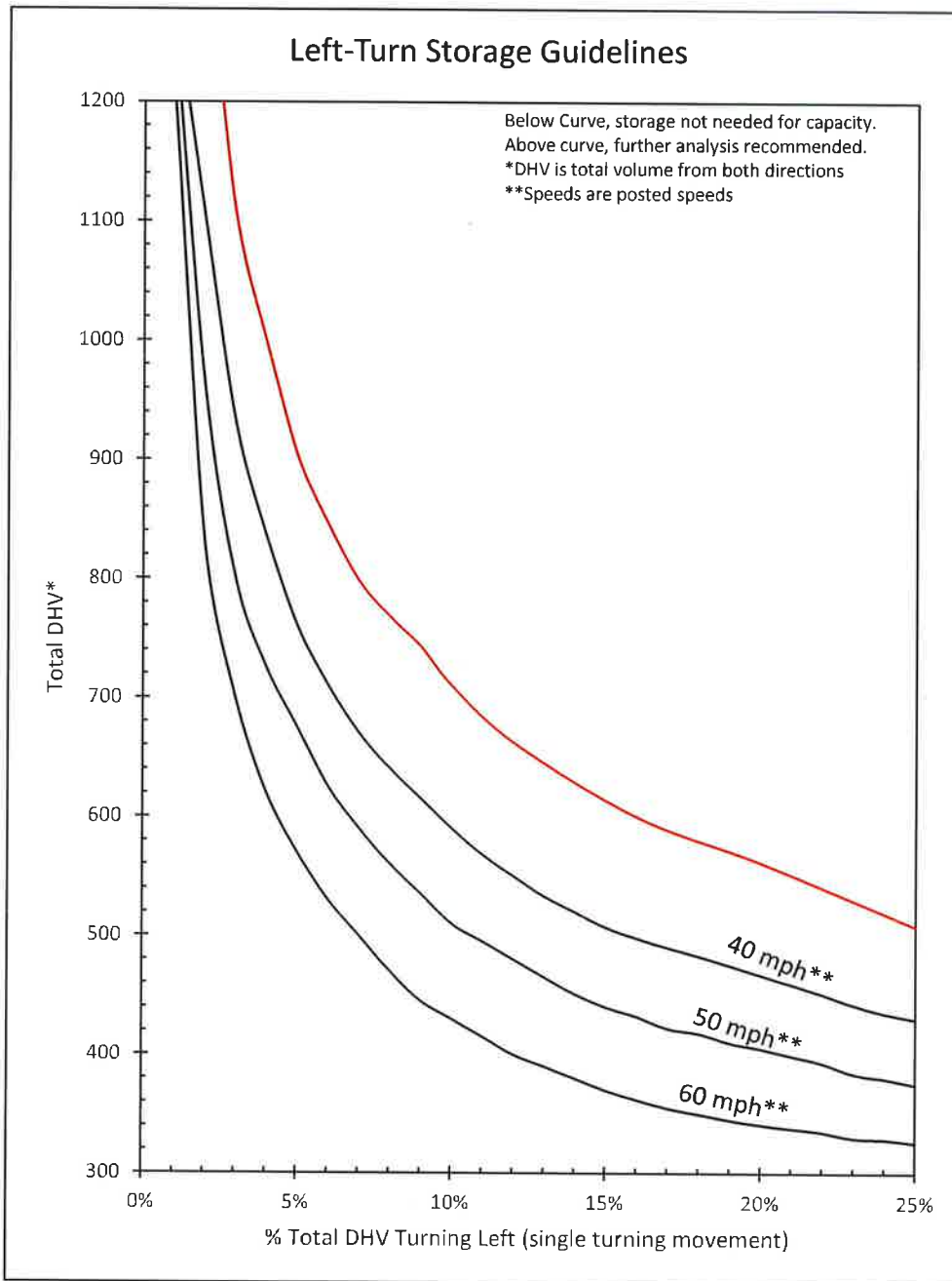
There are not enough trips along Rainier Street at the site access to meet the minimum requirements to assess the need for a left-turn lane into the site from Rainier Street. Additionally, a left-turn warrant was assessed if Rainier Street was connected to the north. Under this scenario, the minimum number of required trips along Rainier Street was also not met. Therefore, a left-turn lane should not be required.

Channelization Analysis



GIBSON TRAFFIC CONSULTANTS

Rainier Street at Site Access



Total DHV: 109
Left Turns: 104
% Left: 95.4%

Posted Speed: 25 mph

Based on WSDOT July 2018 Design Manual: Exhibit 1310-7a, Page 1310-14.

136 Single-Family Development to the north.

Madrona Ridge Development
GTC #21-267

Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM
(a.k.a.): Weekday PM Peak Hour

		NET EXTERNAL TRIPS BY TYPE																		
		IN BOTH DIRECTIONS											DIRECTIONAL ASSIGNMENTS							
LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover		TOTAL In+Out (Total)	PASS-BY		DIVERTED LINK		NEW In+Out (Total)	PASS-BY		DIVERTED LINK		NEW	
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)		% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)		In	Out	In	Out	In	Out
Single-Family Detached	136 units	210	0.99	63%	37%	135	0%	0	135	0%	0	0%	0	135	0	0	0	0	85	50
Total						135		0	135		0		0	135	0	0	0	0	85	50

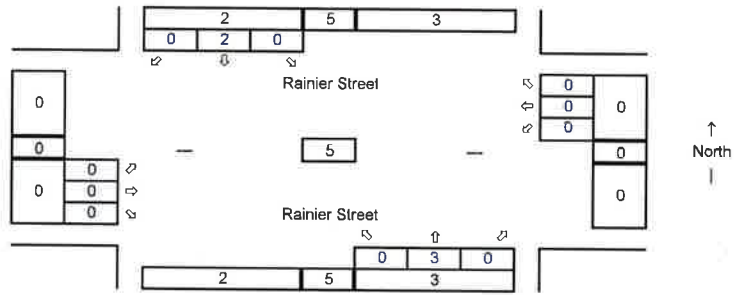
Synchro ID: 1

Existing

Average Weekday
PM Peak Hour

Year: 8/19/21

Data Source: TCC



Future without Project

Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 1.5%

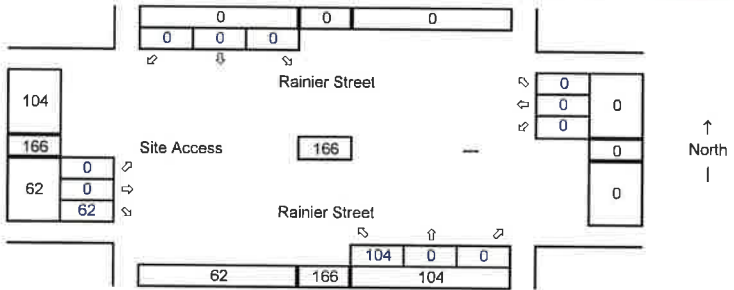
Years of Growth = 4

Total Growth = 1.0614



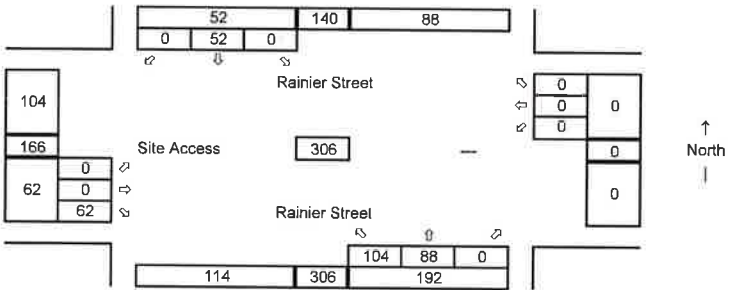
Total Project Trips

Average Weekday
PM Peak Hour



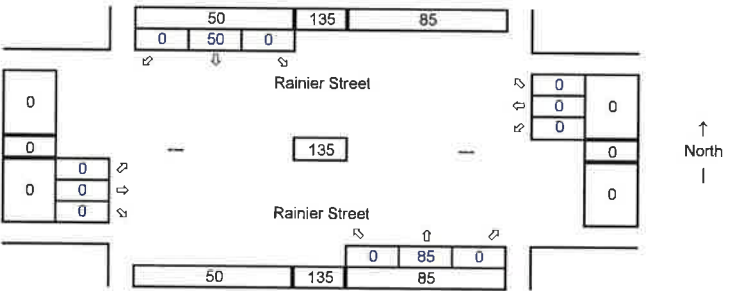
Future with Project

Average Weekday
PM Peak Hour



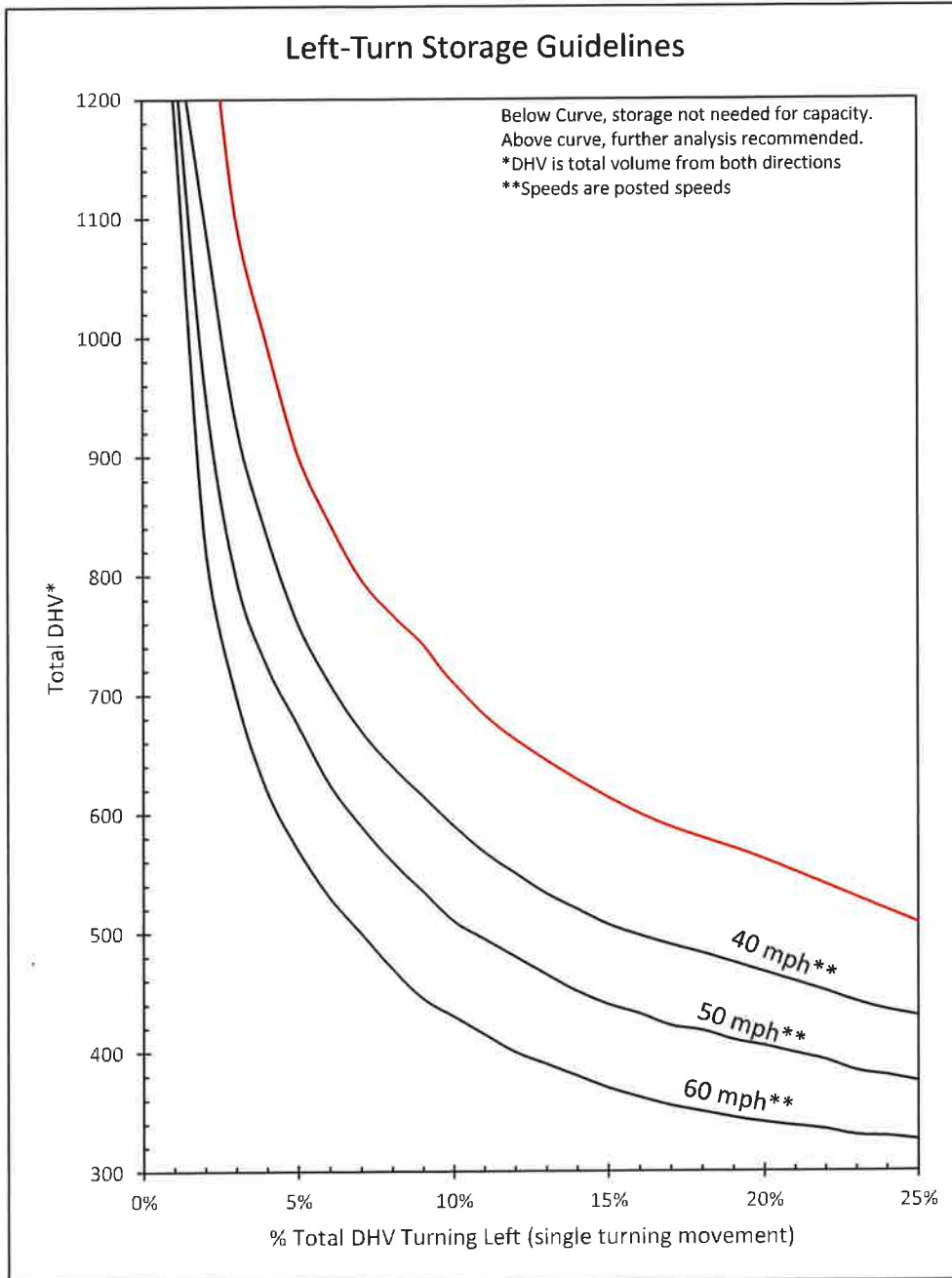
Cut-Through Trips

Average Weekday
PM Peak Hour



GIBSON TRAFFIC CONSULTANTS

Rainier Street at Site Access



Total DHV: 244
Left Turns: 104
% Left: 42.6%

Posted Speed: 25 mph

Based on WSDOT July 2018 Design Manual: Exhibit 1310-7a, Page 1310-14.

