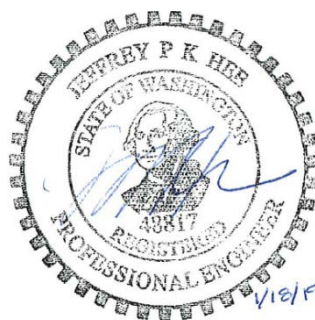




8250 - 165th Avenue NE
Suite 100
Redmond, WA 98052-6628
T 425-883-4134
F 425-867-0898
www.tsinv.com

Marblemount Quarry Skagit County

Traffic Impact Analysis



January 2019

Prepared for: Kiewit, WSDOT and Skagit County

TABLE OF CONTENTS

Executive Summary	1
Introduction	2
Project Location	2
Project Description	2
Trip Generation, Distribution and Assignment	5
Trip Generation.....	5
Trip Distribution and Peak Hour Travel Assignment.....	6
Existing Conditions	8
Major Roadways	8
Bridges	8
Crash History.....	9
Sight Distance.....	11
Traffic Volumes.....	14
Traffic Analysis	17
Mitigation	19

APPENDIX

LIST OF TABLES

Table 1: Peak Continuous Operations Summary.....	Error! Bookmark not defined.
Table 2: Daily Trip Generation Analysis, based on Maximum Production.....	5
Table 3: Number of Reported Crashes, by Year	9
Table 4: Number of Reported Crashes, by Type	9
Table 5: Level of Service Analysis	12
Table 6: PM Peak Hour Intersection Level of Service and Delay.....	17

LIST OF FIGURES

Figure 1: Vicinity Map	3
Figure 2: Preliminary Site Plan	4
Figure 3: PM Peak Hour Trip Distribution	7
Figure 4: Sight Distance Analysis Locations.....	11
Figure 5: 2018 Existing PM Peak Hour Traffic Volumes	15
Figure 6: 2026 Future Without-Project PM Peak Hour Traffic Volumes.....	16
Figure 7: 2026 Future With-Project PM Peak Hour Traffic Volumes	16

EXECUTIVE SUMMARY

This Traffic Impact Analysis summarizes the traffic impacts associated with development of a quarry near Marblemount, WA.

The proposed quarry is off Rockport Cascade Road at land parcel P45543.

A similar and existing quarry site near the City of Mount Vernon at Beaver Lake is currently winding down its operation. Operations, and specifically those related to jetty stone activity, at the Beaver Lake quarry will be replaced by the proposed Marblemount quarry site.

Primary use of the site will be for quarrying and hauling jetty stone for government contracts along the West Coast. Kiewit, the Applicant, is the primary tenant. For the purpose of this analysis, trucks associated with jetty rock activity will be destined to the west of the site to the Port of Bellingham.

The secondary use of the site will be for the selling “waste” rock-material generated by the jetty stone operation. Cunningham Crushing, the current land owner, will sell the “waste” material to local contractors.

The proposed quarry is forecast to generate:

- 260 daily trips, split 130 in and 130 out, with: 100 truck trips related to jetty stone hauling, split 50 in and 50 out, 50 truck trips related to non-jetty stone hauling, split 25 in and 25 out, 70 total employee trips, split 35 in and 35 out, and 40 service, vendor and delivery vehicle trips, split 20 in and 20 out.
- 21 PM peak hour trips (4-5 PM), split 8 in and 13 out, with: about 8 truck trips related to jetty stone hauling, split 4 in and 4 out, about 4 truck trips related to non-jetty stone hauling, split 2 in and 2 out, 5 employee trips outbound, and 4 service, vendor and delivery vehicle trips, 2 in and 2 out.

There are no adverse impacts to local roadways with the proposed quarry. The study intersections satisfy the local level of service standard and there are no significant and adverse crash trends to warrant mitigation.

Sight distance is less than desirable on SR 20 for vehicles entering the roadway from SR 530. The existing advance and reduced speed signs mitigate the less than desirable sight distance for combination trucks and other traffic volumes currently in the area and for future volumes generated by the proposed quarry.

The proposed site access shall be designed to meet Skagit County requirements and the proposal is not forecast to adversely impact local conditions.

INTRODUCTION

This Traffic Impact Analysis summarizes the traffic impacts associated with operation of the proposed Marblemount Quarry. The scope of this traffic impact analysis was reviewed with Skagit County and WSDOT.

Project Location

Kiewit and Cunningham Crushing are proposing to operate out of land parcel P45543. The site is to the southeast of Rockport Cascade Road, near Marblemount. A vicinity map highlighting the proposed parcel is attached as Figure 1.

Project Description

A similar and existing quarry site near the City of Mount Vernon at Beaver Lake is currently winding down its operation. Operations, and specifically those related to jetty stone activity, at the Beaver Lake quarry will be replaced by the proposed Marblemount quarry site.

A site plan is attached as Figure 2. The site is anticipated to be complete and operational in 2019.

Jetty Stone Operation (Kiewit)

Kiewit is proposing to use the site for quarrying jetty stone for government contracts on the West Coast. Jetty stone quarrying and hauling occurs on a contract basis. The site will operate seasonally and intermittently depending on the demand for jetty stone and materials. Site operations are also weather dependent.

Hauling operations are proposed between 6 AM and 6 PM Monday through Saturday. Truck loads average 26 tons per load and during peak extraction periods, the average daily haul load is about 1,300 tons of jetty stone. Trucks include semis (25-ton capacity) and low-boys (27-ton capacity). Loading starts at 6 AM and the operation is constant throughout the day.

During peak operation, the site would be staffed by 1 manager, 1 superintendent, 1 engineer, 1 clerk, 4 drill operators, 2 splitters, 7 miners, 4 loaders and 4 maintenance personnel for a total of up to 25 persons. The typical onsite employee shift starts before 6 AM and ends after 6 PM, except for the clerk who generally leaves around 4:30 PM and the site maintenance staff who are split into two shifts from 6 AM to 6 PM and from noon to 10 PM, depending on the maintenance needs on a given day.

Local Rock Operation (Cunningham Crushing)

Cunningham Crushing is proposing to sell the waste rock material generated from the jetty stone operation. Jetty stones are required to meet certain specifications and material not meeting those specifications will be stored onsite and sold by Cunningham Crushing to local contractors. Peak haul activity for the waste material is estimated around 500 tons per day. Trucks related to these activities include tractor trailers (12-ton capacity) and dump-and-pups (28-ton capacity). Truck loads for these trucks average 20 tons per load.

Like Kiewit, Cunningham Crushing is also anticipated to operate six days a week with haul activity between 6 AM and 6 PM. Based on their operational footprint, Cunningham Crushing is estimated to have a peak onsite staff of 10 persons.

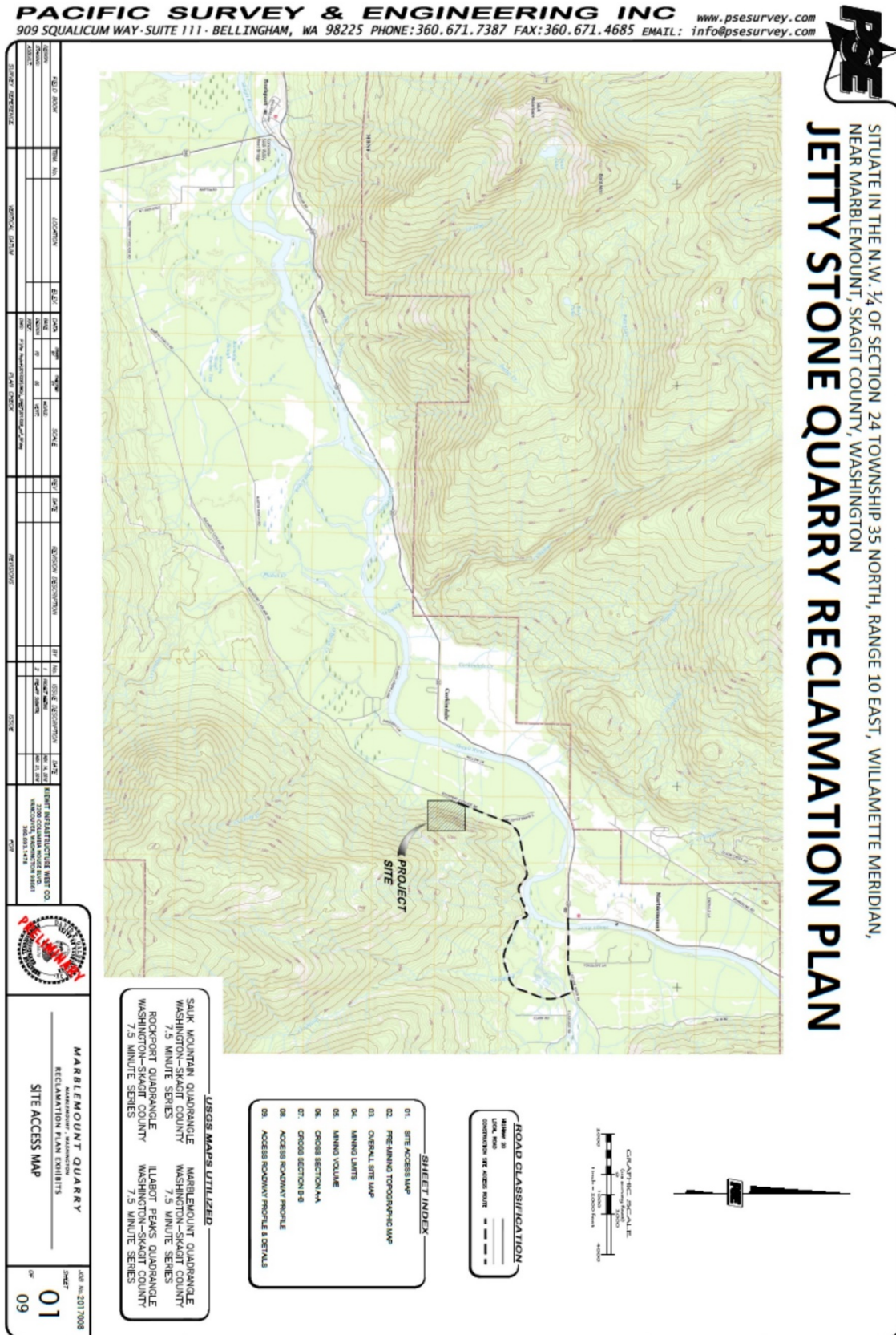


Figure 1: Vicinity Map

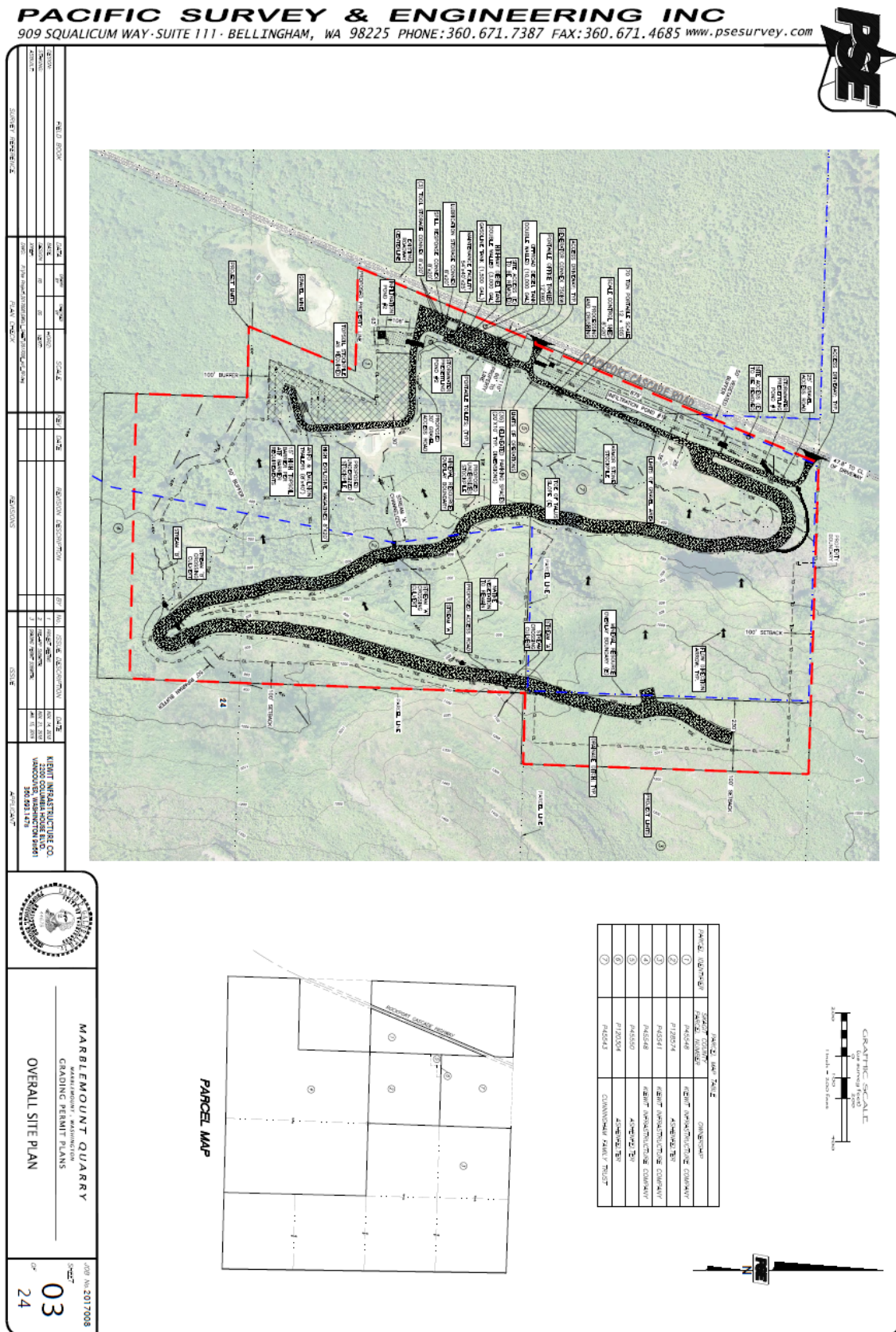


Figure 2: Preliminary Site Plan

TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

This section summarizes the forecasted site trip generation and peak hour traffic distribution and assignment.

Trip Generation

As noted in the previous section, the Beaver Lake quarry site near the City of Mount Vernon is winding down its operations. Historically, the Beaver Lake site has been operating at a similar rate and with similar traffic volumes to the proposed Marblemount quarry site. Traffic-generated by the existing quarry will be replaced by the proposed Marblemount quarry as the existing site phases out and the new quarry phases in.

Trip generation for the proposed site is based on the operations descriptions in the previous section. On a given day, during peak operations, the proposed quarry is forecast to yield an average of 1,300 tons of jetty stone rock per day and 500 tons of non-jetty stone material per day. The site could operate six days a week.

Table 1 summarizes the daily and peak hour trip generation forecast based on the peak site operations and using the following peak operations assumptions from the previous section:

- Hauling operations (truck traffic) occur over a 12-hour day
- Peak operations (1,300 tons of jetty stone per day) at 26 average tonnage of jetty stone per truck represents 50 trucks per day or 100 truck trips per day. With steady operations, there are about 8 truck trips per hour (100 trucks trips per day ÷ 12-hour day).
- Peak operations (500 tons of non-jetty stone material per day) at 20 average tonnage of non-jetty stone material per truck represents 25 trucks per day or 50 truck trips per day. With steady operations, there are about 4 truck trips per hour (50 trucks trips per day ÷ 12-hour day).
- 10-20 service vehicle trips are possible on a given and these are anticipated to be spread equally between 7 AM and 5 PM.

Table 1: Daily Trip Generation Analysis, based on Maximum Production

Time-Period	Trips Cunningham Crushing		Trips Kiewit – Jetty Stone		Service/Vendor Delivery Trips ⁴	Total Hourly Vehicle Trips
	Trucks ¹	Employees ²	Trucks ¹	Employees ³		
6-7 AM	4.2	6.0	8.3	23.0	0.0	41.5
7-8 AM	4.2	4.0	8.3	0.0	4.0	20.5
8-9 AM	4.2	0.0	8.3	0.0	4.0	16.5
9-10 AM	4.2	0.0	8.3	0.0	4.0	16.5
10-11 AM	4.2	0.0	8.3	0.0	4.0	16.5
11-12 PM	4.2	0.0	8.3	0.0	4.0	16.5
12-1 PM	4.2	0.0	8.3	2.0	4.0	18.5
1-2 PM	4.2	0.0	8.3	0.0	4.0	16.5
2-3 PM	4.2	0.0	8.3	0.0	4.0	16.5
3-4 PM	4.2	6.0	8.3	0.0	4.0	22.5
4-5 PM	4.2	4.0	8.3	1.0	4.0	21.5
5-6 PM	4.2	0.0	8.3	0.0	0.0	12.5
6-10 PM	0.0	0.0	0.0	24.0	0.0	24.0
Daily	50.0	10.0	100.0	25.0	40.0	260.0

¹ Truck loading is constant throughout the 12-hour day (6 AM-6 PM)

² Assumed employee hours for Cunningham Crushing

³ Employee hours from Kiewit management

⁴ Assumes deliveries from 7 AM and 5 PM, two deliveries vehicles per hour with one-trip in and one-trip out

The proposed quarry operation is forecast to generate:

- 260 daily trips, split 130 in and 130 out, with: 100 truck trips related to jetty stone hauling, split 50 in and 50 out, 50 truck trips related to non-jetty stone hauling, split 25 in and 25 out, 70 total employee trips, split 35 in and 35 out, and 40 service, vendor and delivery vehicle trips, split 20 in and 20 out.
- 21 PM peak hour trips (4-5 PM), split 8 in and 13 out, with: about 8 truck trips related to jetty stone hauling, split 4 in and 4 out, about 4 truck trips related to non-jetty stone hauling, split 2 in and 2 out, 5 employee trips outbound, and 4 service, vendor and delivery vehicle trips, 2 in and 2 out.

The PM peak hour period, between 4 and 6 PM, represents the time when traffic volumes on the adjacent roadways are typically at their highest.

Trip Distribution and Peak Hour Travel Assignment

Trip were distributed and assigned to the local road network based on the following assumptions:

- Kiewit-jetty stone-related truck traffic is to I-5 via SR 20 and Cook Road in the City of Sedro-Wooley. The overall impact of truck trips from the proposed site are replacing existing jetty stone truck trips generated by the Beaver Lake quarry near the City of Mount Vernon, as it phases out.
- Cunningham Crushing-non-jetty stone-related trucks will serve local contractors and impacts to I-5 are negligible. These truck trips are split 50% to Concrete and Sedro-Woolley (west); 40% to Darrington (south); and 10% to the east (east of Marblemount).
- Employees and deliveries, vendors and service vehicles would be generally distributed 60% to the west; 30% to the south; and 10% to the east.

Figure 3 shows the proposed peak hour trip distribution and PM peak hour travel assignment.

The Appendix includes the PM peak hour trip assignments for the trucks generated by Kiewit and Cunningham Crushing hauling operations, Kiewit and Cunningham Crushing onsite staff and service, vendor and delivery vehicles.

Cook Road is the primary truck route in Skagit County. The net increase in truck traffic on Cook Road and at I-5 will be negligible with operation of the existing Beaver Lake Quarry being replaced by operation of the proposed Marblemount Quarry.

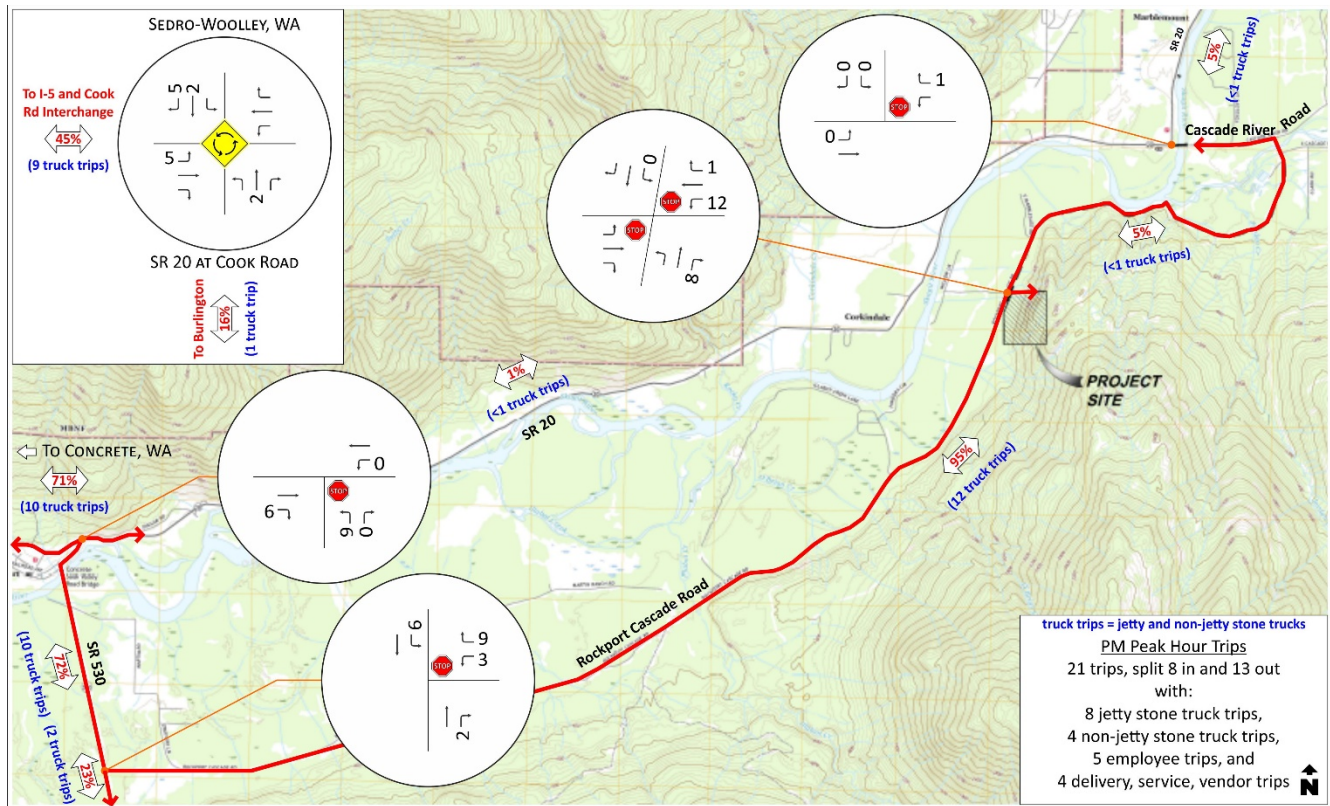


Figure 3: PM Peak Hour Trip Distribution

EXISTING CONDITIONS

Major Roadways

Major roadways in the study area are described below:

- SR 20, North Cascades Highway, is an east-west state route north of Rockport Cascade Road and the proposed site. Within the study area SR 20 has one lane in each direction and the posted speed limit in Rockport is 50-mph and in Marblemount is 35-mph. Reduced speed signs are posted on SR 20 approaching SR 530 and approaching the Cascade River Road intersection in Marblemount.
- SR 530 is a north-south state route west of the proposed site. At Rockport Cascade Road, SR 530 has one lane in each direction and the posted speed of 55-mph.
- Rockport Cascade Road is an east-west roadway with a posted speed limit of 50-mph. 15-mph and 35-mph warning signs are posted to the east and north of the site as the roadway parallels the Skagit and Cascade Rivers.
- Cascade River Road is a two lane east-west road with a posted speed limit of 35-mph. The roadway is to the northeast of the site and provides access to downtown Marblemount.
- Cook Road is a truck route connecting I-5, north of Burlington, to SR 20 in Sedro-Woolley. Traffic related to operation of the proposed quarry will replace existing traffic currently operating out of the Beaver Lake quarry near Mount Vernon.

Bridges

SR 530 includes two bridges within the study area

- WSDOT Bridge Number 289 over Bohs Slough, north of Martin Road
- WSDOT Bridge Number 290 over Skagit River, south of Rockport

There are two existing bridges on Rockport Cascade Road includes:

- Skagit County Bridge Number 40094 at Illabot Creek, west of the site. In August 2018 the County finished work on two new bridges at Illabot Creek. The Skagit County Public Works 2017 Annual Bridge Report indicated an ADT volume on the Illabot Creek Bridge of 210 vehicles with a truck percentage of 11% and a sufficiency rating of 95%.
- Skagit County Bridge Number 40095 at Jordan Creek, east of the site. The Skagit County Public Works 2017 Annual Bridge Report indicated an ADT volume on the Jordan Creek Bridge of 198 vehicles with a truck percentage of 7% and a sufficiency rating of 98%.

Cascade River Road includes on bridge over the Skagit River in Marblemount connecting to Cascade River Road to SR 20. Skagit County Bridge Number 40070, north of the site. The Skagit County Public Works 2017 Annual Bridge Report indicated an ADT volume on the Skagit River Bridge of 585 vehicles with a truck percentage of 5% and a sufficiency rating of 56%. The Skagit River Bridge qualified as being Functionally Obsolete.

Crash History

WSDOT and Skagit County provided collision data between 2013 and 2017 at the SR 20 and Cook Road intersection in the City of Sedro-Woolley (SRMP 65.04 to 65.08); on SR 20 between SR 530 (SRMP 97.64) and east Shular Road (SRMP 98.5); on SR 20 at Cascade River Road (SRMP 106.11 to 106.12); on SR 530 between SR 20 (SRMP 67.71) to Rockport Cascade Road (SRMP 66.04); on Rockport Cascade Road between SR 530 and Cascade River Road; and on Cascade River Road between SR 20 and Rockport-Cascade Road.

During this five-year period 19 total crash incidents were reported. No fatalities were reported. The crashes are summarized in Table 3, by year, and in Table 4, by type.

Table 3: Number of Reported Crashes, by Year

Location	Crashes Reported 2013-2017					Annual Average
	2013	2014	2015	2016	2017	
SR 20 at Cook Rd Roundabout, Sedro-Woolley	0	2	1	0	5	2.0
SR 20 at SR 530, Rockport	0	0	0	0	1	0.2
SR 530 at Rockport Cascade Rd	0	0	0	0	0	0.0
Rockport Cascade Rd at Cascade River Rd	0	0	0	0	0	0.0
SR 20: SR 530 to Shular Rd	0	0	1	0	0	0.2
SR 20: SR 530 to Rockport-Cascade Rd	0	1	2	0	1	0.0
Cascade River Rd: SR 20 to Rockport Cascade Rd	0	1	0	1	0	0.4
Rockport Cascade Rd: SR 530 to Cascade River Rd	0	1	1	1	0	0.2

Table 4: Number of Reported Crashes, by Type

Location	Rear End	At Angle	Object	Ditch	Animal	Total
SR 20 at Cook Rd Roundabout, Sedro-Woolley	5	1	2	0	0	8
SR 20 at SR 530, Rockport	0	1	0	0	0	1
SR 530 at Rockport Cascade Rd	0	0	0	0	0	0
Rockport Cascade Rd at Cascade River Rd	0	0	0	0	0	0
SR 20: SR 530 to Shular Rd	0	0	0	0	1	1
SR 20: SR 530 to Rockport-Cascade Rd	0	0	1	1	2	4
Cascade River Rd: SR 20 to Rockport Cascade Rd	0	0	1	1	0	2
Rockport Cascade Rd: SR 530 to Cascade River Rd	0	1	1	1	0	3

SR 20 at Cook Road

Eight crashes were reported at SR 20 and Cook Road between 2013 and 2017. A roundabout was installed at the intersection in 2015. Cook Road is a major truck route to and from I-5.

In 2014, 1 rear end crash and 1 entering at angle crash were reported. In 2015, 1 rear end crash was reported. In 2017, 3 rear end crashes and 2 crashes involving vehicle colliding with a fence adjacent to the road to the east of the roundabout. Half of the reported incidents resulted in a possible injury.

The Annual Average Daily Traffic (AADT) volume on SR 20 at Cook Road is about 20,000 vehicles. The intersection's resulting crash rate is computed as 0.22 crashes per million entering vehicles. A crash rate of 1.0 generally identifies a high location, and the crash rate associated with this intersection does not suggest a high crash location.

Based on the low crash rate and 1-year spike in crash incidents, this intersection is not considered a high crash location requiring mitigation.

SR 20 at SR 530

One crash was reported at the intersection of SR 20 and SR 530. SR 530 is stop sign controlled approaching SR 20 with separate left turn and right turn approaches. In 2017, a passenger vehicle making a left turn from SR 530 collided with a westbound pickup truck on SR 20. No injuries were reported.

The AADT volume on SR 20 at SR 530 is about 2,400 vehicles. The intersection's resulting crash rate is computed as 0.23 crashes per million entering vehicles. This intersection is not considered a high crash location requiring mitigation.

One crash was reported east of intersection, but not related to the intersection. This incident involved an eastbound vehicle striking an elk. There are no trends to suggest the section of SR 20 east of SR 530 is a high crash location requiring mitigation.

Rockport Cascade Road

Three crashes were reported on Rockport Cascade Road between SR 530 and Cascade River Road. No incidents were reported near the quarry site, which is about 3 road-miles south and west of the roadway's intersection with Cascade River Road. Reported incidents on Rockport Cascade Road include:

- A car striking a utility pole in 2014, wherein the driver was asleep, and two persons were injured;
- A pickup truck colliding with a fence near the fish hatchery, near Marblemount in 2015, wherein one injury was reported, and the driver was noted as being fatigued; and
- A pickup truck making an improper turn colliding with another pickup truck 2016, and no injuries were reported.

Also, in 2018, Skagit County records, included an incident with a passenger vehicle running off the road into a roadside ditch, and no injuries were reported. This incident is not included in the tables above.

The AADT volume on Rockport Cascade Road is about 250 vehicles. This 10.1-mile road segment had a crash rate of 0.08 crashes per road mile and there are no trends to suggest a high crash location along Rockport Cascade Road.

Cascade River Road

Two crashes were reported on Cascade River Road between SR 20 and Rockport Cascade Road. In 2014, due to driver inattention, a pickup truck collided with a tree on the side of the road, and in 2016, a pickup truck ran into a roadside ditch, with the driver noted as being under the influence of alcohol. In both instances, no injuries were reported.

The AADT volume on Cascade River Road is about 430 vehicles. This 0.7-mile stretch of road had a crash rate of 0.57 crashes per road mile. Based on the two reported incidents there is no trend to suggest a high crash location on Cascade River Road.

SIGHT DISTANCE

Stopping and intersection sight distance were reviewed in the field using guidelines from the AASHTO Green Book (2011) at the following locations and the site access:

1. SR 20 at SR 530 (left-turn out)
2. SR 20 at SR 530 (right-turn out)
3. Rockport Cascade Road (left-turn out) at SR 530
4. Rockport Cascade Road (right-turn out) at SR 530
5. Rockport Cascade Road at Site Access
6. Rockport Cascade Road at Cascade River Road
7. SR 20 at Cascade River Road

Stopping sight distance measures the distance it takes an approaching driver to recognize an object at the edge of the travel way, apply the vehicle's brakes and stop the vehicle.

Intersection (or entering) sight distance measures the distance observed by a driver stopped at an intersecting highway to decide whether to enter or cross the opposing traffic flow. If stopping sight distance is available at an intersection, then drivers have sufficient sight distance to anticipate and avoid collisions.

Figure 4 shows the sight distance analysis locations, posted and advisory speeds and measured 85th-percentile speeds, the latter from Skagit County, in the study area.

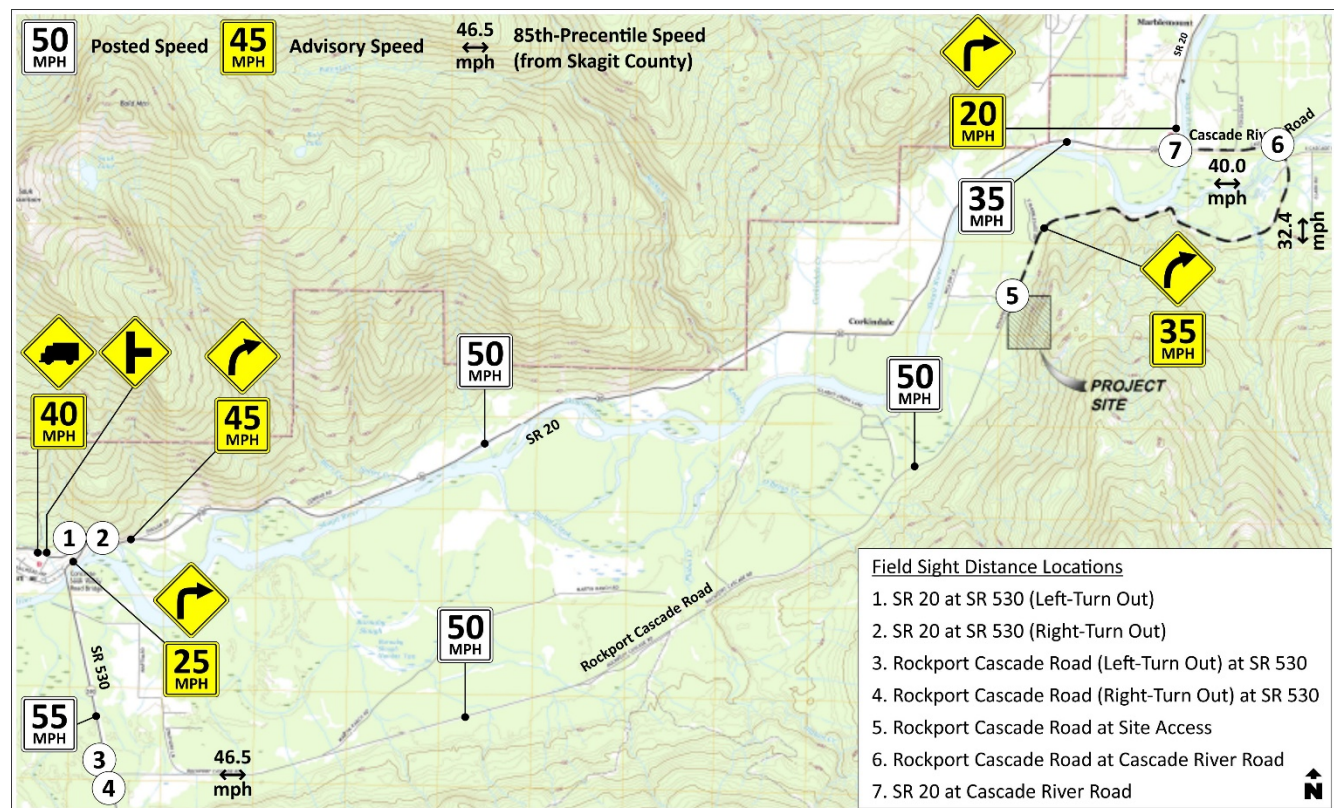


Figure 4: Sight Distance Analysis Locations

Table 5 summarizes the sight distance field measures and AASHTO requirements.

Table 5: Level of Service Analysis

Location	Ref. Dir. ²	Posted (mph)	Design (mph)	Stopping (feet)		Entering (feet)			Okay? (Yes/No)
				Std. ⁸	Field ⁹	Car ¹⁰	Truck ¹¹	Field ⁹	
SR 20 at SR 530 (left out)	W/O	50	40 ³	305	960	445	680	960	Yes
	E/O	50	45 ⁴	360	810	500	765	810	Yes
SR 20 at SR 530 (right out)	W/O	50	40	305	1,135	385	620	1,135	Yes
R-C Rd ¹ (left out) at SR 530	S/O	55	65	645	1,100	720	1,100	1,100	Yes
	N/O	55	65	645	1,100	720	1,100	1,100	Yes
R-C Rd ¹ (right out) at SR 530	S/O	55	65	645	1,100	625	1,005	1,100	Yes
R-C Rd ¹ at Site Access	N/O	50	46.5 ⁵	360	1,000	500	765	1,000	Yes
	S/O	50	46.5 ⁵	570	1,100	665	1,015	1,100	Yes
R-C Rd ¹ at Cascade River Rd	W/O	35	40.0 ⁶	360	765	500	765	765	Yes
	E/O	35	40.0 ⁶	360	655	500	765	655	No
SR 20 at Cascade River Rd	N/O	35	20 ⁷	115	765	225	340	765	Yes
	E/O	35	45	360	765	500	765	765	Yes

¹ Rockport Cascade Road

² Direction looking from the intersection (W/O = west of; E/O = east of; N/O = north of; and S/O = south of)

³ 40-mph advisory speed on SR 20 approaching SR 530 from the west

⁴ 45-mph advisory speed on SR 20 approaching SR 530 from the east

⁵ 46.5-mph 85th-percentile speed measured, by Skagit County, on Rockport Cascade Road between June 20 and 22, 2017

⁶ 40.0-mph 85th-percentile speed measured, by Skagit County, on Cascade River Road between June 20 and 22, 2017

⁷ 20-mph advisory speed on SR 20 approaching Cascade River Road from the north

⁸ AASHTO Stopping Sight Distance, refer to AASHTO Table 3-1

⁹ Available sight distance measured in the field

¹⁰ Entering sight distance for a "passenger car", refer to AASHTO Table 9-6 for left from stop and Table 9-8 for right from stop

¹¹ Entering sight distance for a "combination truck", refer to AASHTO Tables 9-5 and 9-7 for time gap values

SR 20 at SR 530

SR 20 has a posted speed of 50-mph. Approaching SR 530 from the west, SR 20 includes a 40-mph advisory speed sign. Approaching SR 530 from the east, SR 20 includes a 45-mph advisory speed sign. The design speed of the roadway was adjusted to match the advisory speed signage approaching this intersection.

The SR 530 approach is split at SR 20 with the west leg for left turns out from SR 530 to SR 20 and the east leg for right turns out from SR 530 to SR 20. At the intersection, SR 530 has an upward grade to SR 20 for the left turn movement from SR 530 to SR 20.

Stopping sight distance standards are satisfied at the intersection.

A driver stopped at the west leg on SR 530 has 960 feet of entering sight distance to the west of the intersection and 810 feet to the east of the intersection. Entering sight distance sightlines meet the entering sight distance requirements for a passenger car. For a combination truck, the advisory speeds meet the entering sight distance requirement.

A driver stopped at the east leg on SR 530 has 1,135 feet of entering sight distance to the west of the intersection. The east leg meets the entering sight distance requirement for a vehicle (passenger car or combination truck) making a right turn to SR 20.

Rockport Cascade Road at SR 530

SR 530 has a posted speed of 55-mph near Rockport Cascade Road. A design speed of 65-mph was used to evaluate sight distance. At this T-intersection, the Rockport Cascade Road approach is split with the south leg serving left turns from Rockport Cascade Road to SR 530 and a northerly leg serving right turns from Rockport Cascade Road to SR 530.

The sightlines at this intersection meet the stopping and entering sight distance requirements.

Rockport Cascade Road at Site Access

Rockport Cascade Road has a posted speed of 50-mph. The 85th-percentile speed on Rockport Cascade Road measured to the east of SR 530 is 46.5 mph.

North and east of the site, Rockport Cascade Road parallels to the Skagit and Cascade Rivers and winding road and reduced speed signs are posted along the roadway. A 35-mph speed reduction sign is located on the curve of Rockport Cascade Road as the roadway turns from the east to the southwest and past the site.

The design speed on Rockport Cascade Road at the site access is estimated at 46.5-mph to the south and north of the site.

The available stopping and entering sight distances along Rockport Cascade Road are 1,000 feet or more and meet the sight distance requirements.

Rockport Cascade Road at Cascade River Road

Cascade River Road has a 35-mph posted speed. The 85th-percentile speed on Cascade River Road measured to the east of SR 20 is 40.0 mph.

The sightline west of the Rockport Cascade Road is over 765 feet and meets the stopping and entering sight distance requirements for a 40-mph design speed.

To the east of Rockport Cascade Road, Cascade River Road bends to the north. The sightline to the east of Rockport Cascade Road are limited by a horizontal curve roughly 655 feet east of the intersection. The available entering sight distance for a passenger car making a left turn at the intersection is supports a 40-mph design speed, while the available entering sight distance for a combination truck falls 25 feet short of sight distance recommendation.

There were no crashes reported at this intersection between 2013 and 2017 to suggest that the sight distance was a significant concern.

SR 20 at Cascade River Road

The available stopping and entering sight distances along Rockport Cascade Road will support vehicles exiting the site to make a left turn or right turn onto Rockport Cascade Road.

TRAFFIC VOLUMES

Year 2018 PM peak hour volume were collected on December 12, 2018 at:

- SR 20 at SR 530
- Rockport Park Road and Railroad Ave at SR 530
- Rockport Cascade Road at SR 530
- Rockport Cascade Road at Cascade River Road
- SR 20 at Cascade River Road

The PM peak hour period is defined as the highest four consecutive 15-minute traffic volume intervals between 4 PM and 6 PM. This period generally represents the time when the traffic volumes on public roadways are at their highest.

The traffic volumes on SR 20 and SR 530 were adjusted to account for non-winter conditions.

The WSDOT has permanent traffic counters on major highways and publishes the highest 200 hours of data in the Peak Hour Report. The WSDOT does not employ permanent counters on SR 20 west of Ross Lake, on the west side of the state, and no peak hour data is collected on SR 530.

Peak hour volumes are collected on US 2 near Stevens Pass, and WSDOT's 2016 peak hour volume on US 2 in Skykomish was used to adjust the volumes on SR 20 and SR 530 to peak seasonal, non-winter, conditions. On US 2, the non-winter peak hour volume was recorded at 5 PM on Sunday, April 17 with 1,228 vehicles on US 2. The peak hour volume is 21.39% of the Annual Average Daily Traffic (AADT) volume on US 2 at this location.

The Average Daily Traffic (ADT) volume on SR 20 at SR 530 is about 2,300 vehicles. The ADT volume on US 2 in Skykomish is 7,500 vehicles. The PM peak hour volume collected at SR 20 and SR 530 was 150 vehicles. Using the AADT, ADT and peak hour volumes the non-winter peak hour volume at SR 20 and SR 530 was increased by a factor of 2.57, from 150 vehicles to 385 vehicles. The turning movement volumes at the SR 20 and SR 530 intersection were adjusted accordingly.

Review of Skagit County traffic volume data compiled in June 2017, on both Rockport Cascade Road and Cascade River Road, showed that the December 2018 counts were similar to the volumes recorded on the Skagit County roadways during non-winter conditions. Thus, turning movement volumes on the non-state highway legs of the study intersections were not adjusted up based on non-winter conditions.

Figure 5 illustrates the 2018 intersection turning movement volumes. For this study, turning movement volumes are rounded to the nearest multiple of 5 to represent normal daily fluctuations in traffic. Copies of the WSDOT and Skagit County volume data references are provided in the Appendix.

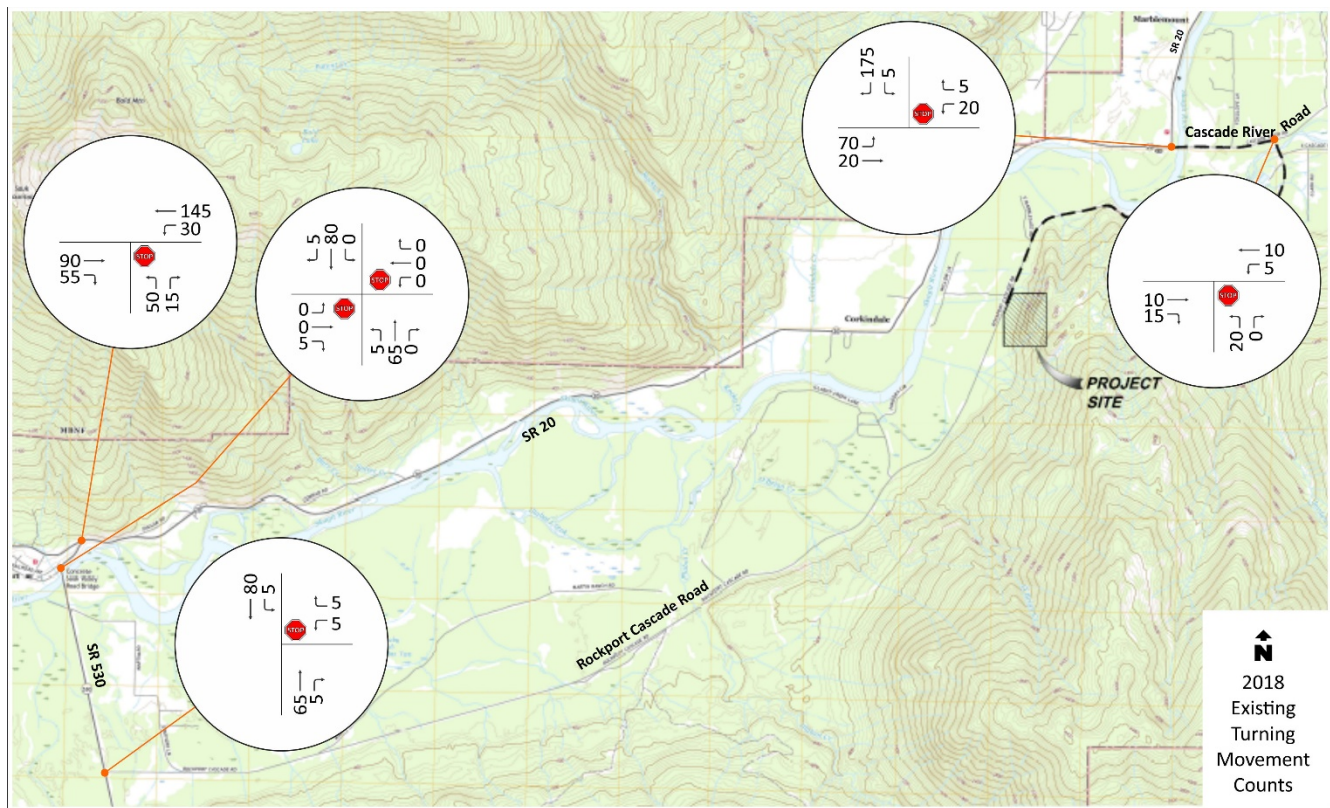


Figure 5: 2018 Existing PM Peak Hour Traffic Volumes

The quarry is anticipated to be in operation in 2019. Year 2025 was selected as the horizon year to represent 6-years after opening.

There are no local transportation facility improvements programmed by WSDOT or Skagit County near the quarry site.

Future volumes were forecast by adding a very conservative 1.0% annual growth factor to the existing 2018 volumes. Future year 2026 volumes without the proposed quarry are illustrated in Figure 6.

A 1% annual growth rate was applied to the existing 2018 conditions. Based on review of local traffic and development activity, this growth rate is conservative.

Site generated PM peak hour trips, see Figure 3, were added to the future without-quarry traffic volumes to forecast conditions with the quarry in operation. Future year 2025 volumes with the proposed quarry are illustrated in Figure 7.

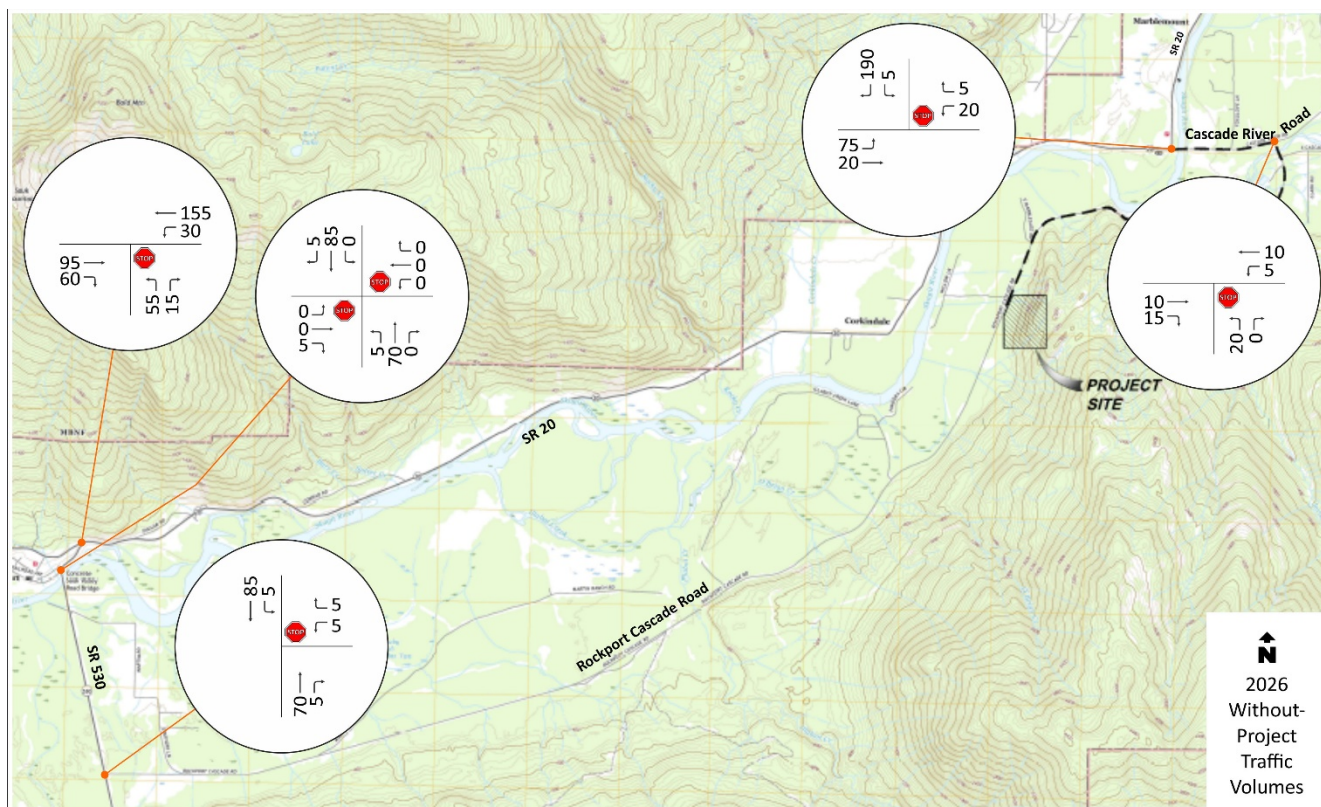


Figure 6: 2026 Future Without-Project PM Peak Hour Traffic Volumes

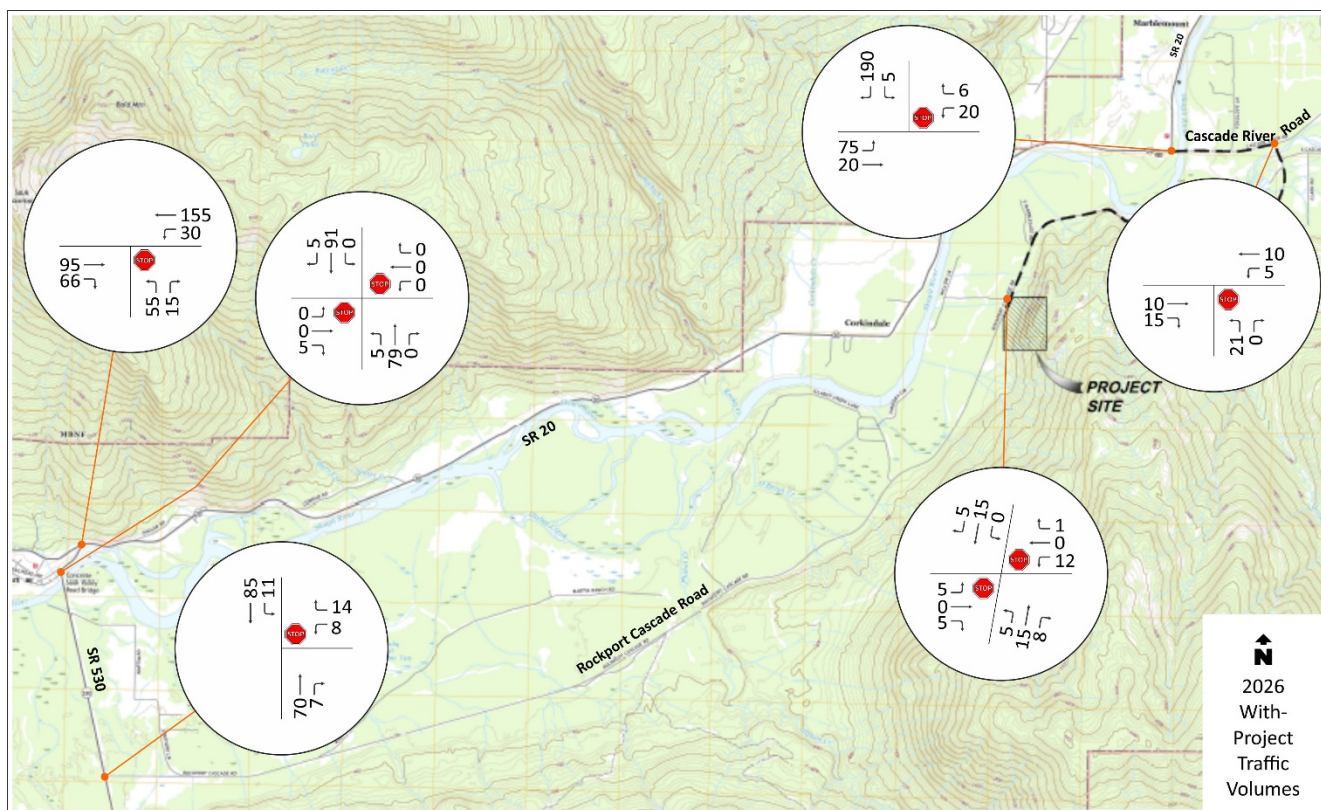


Figure 7: 2026 Future With-Project PM Peak Hour Traffic Volumes

TRAFFIC ANALYSIS

Highway Capacity Manual 2010 methodology was used to compute the traffic operations, specifically the level of service (LOS) and delay, of the study intersections. For this analysis, the Synchro computer program was used to evaluate intersection operations.

In Skagit County, the WSDOT LOS standard for SR 20 and SR 530 is LOS C. The standard for Skagit County road intersections is LOS D.

Table 6 summarizes the PM Peak hour study intersection operations for existing and future without-Project and with-Project conditions. Intersection capacity reports are included in the Appendix.

Table 6: PM Peak Hour Intersection Level of Service and Delay

Intersection	2018 Existing		2026 Without-Project		2026 With-Project	
	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹
SR 20 at SR 530	B	10.4	B	10.8	B	11.2
Railroad/Park at SR 530	A	8.7	A	8.8	A	8.8
Rockport Cascade Rd at SR 530	A	7.4	A	7.5	A	7.5
Rockport Cascade Rd at Site Access	-	-	-	-	B	10.3
Rockport Cascade Rd at Cascade River Rd	A	9.0	A	9.0	A	9.0
SR 20 at Cascade River Rd	B	10.8	B	11.0	B	11.0

¹ Delay expressed in seconds of vehicle delay

All study intersections meet the local LOS standards and no mitigation is required.

SR 20 at SR 530

At SR 20 and SR 530 the left turn movement operates at LOS B with 11.2 seconds of delay.

The advisory speed signs in this area mitigate driver sightlines on SR 20. Only one incident was reported in 2017. And the past 5-year crash history did not suggest any adverse collision trend at this location.

Haul vehicles currently travel through this intersection of two state highways. The additional traffic and specifically truck traffic generated by the proposed quarry is not forecast adversely impact delay or safety at this intersection. Mitigation is not required.

Rockport Park Lane and Railroad Ave at SR 530

The intersection operates at LOS A. Truck traffic is not forecast to impact the Rockport neighborhood. The posted advisory speeds on SR 530 north of Skagit River Bridge are 25 mph. Mitigation is not required.

Rockport Cascade Rd at SR 530

At Rockport Cascade Road and SR 530 the left turn movement operates at LOS A.

There are no existing safety issues with this intersection that suggest the proposed quarry will adversely impact. Mitigation is not required.

Rockport Cascade Rd at Site Access

The site access is forecast to operate at LOS B and meets the Skagit County level of service requirements. The access will be designed to support the design criteria of Skagit County for the function of the proposed quarry.

Advanced signage is recommended to provide notify approaching vehicles of the active quarry.

Rockport Cascade Rd at Cascade River Road

The intersection of Rockport Cascade Rd at Cascade River Road is forecast to operate at LOS A.

There is an existing sightline deficiency for trucks making a left turn on Rockport Cascade Road and looking to the east of the intersection. The driver sightline falls 25 feet shy of the entering sight distance standards for combination trucks, due to the horizontal curvature on Cascade River Road.

No collisions were reported at this intersection between 2013 and 2017. A sign in advance of the intersection could be provided if Skagit County finds it warranted to warn drivers approaching the intersection from the east that there may be trucks turning onto the road.

SR 20 at Cascade River Road

The intersection of SR 20 at Cascade River Road is computed to operate at LOS A with the proposed quarry. The intersection delay and the available sightlines satisfies the local standards. Mitigation is not required.

The truck-route for jetty stone hauling, does not pass through Marblemount and will not impact the existing Skagit River Bridge. Local truck traffic generated by Cunningham Crushing operations may travel to or through Marblemount, but local truck traffic is negligible through this intersection, and particularly on the bridge.

MITIGATION

Based on the analysis above, the proposed quarry is not forecast to adversely impact the local road network.

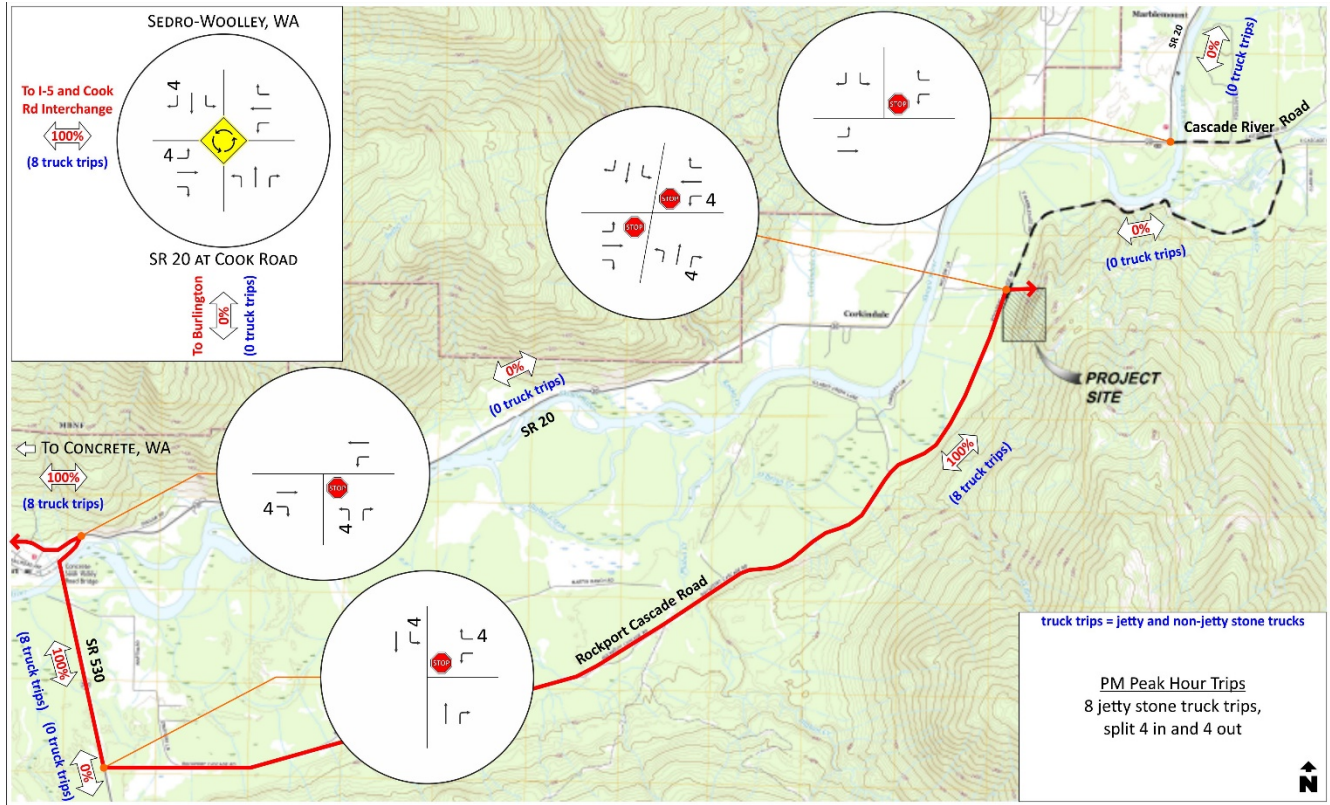
The study intersections satisfy the local level of service standards and there are no significant crash trends that warrant mitigation.

Sight distance is less than desirable on SR 20 for vehicles entering the roadway from SR 530. The existing signage, in advance of the intersection, mitigate the less than desirable sight distance for combination trucks and other traffic passing through the area. The traffic impacts by the proposed quarry trucks are not anticipated to negatively impact or change the sight distance at this intersection.

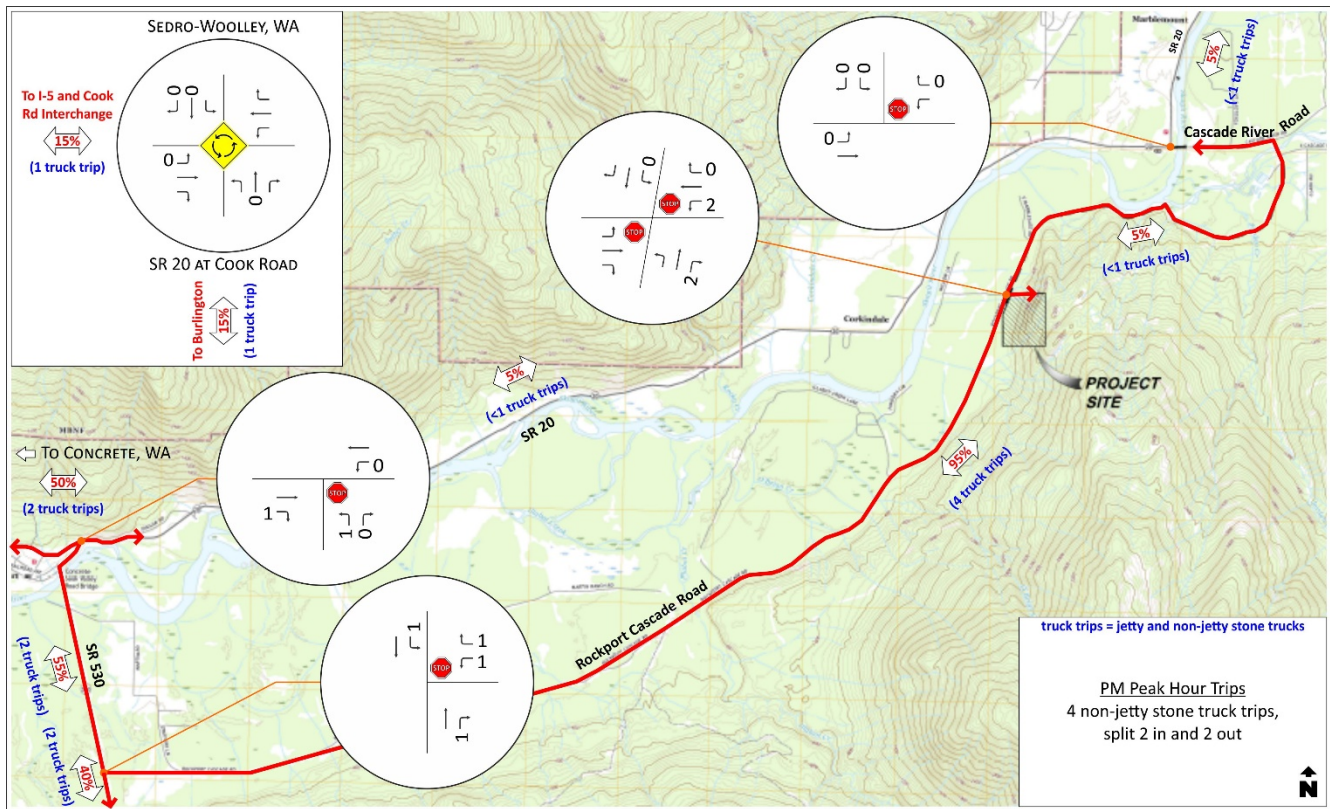
The proposed site access shall be designed to meet Skagit County requirements and the proposal is not forecast to adversely impact local conditions.

No mitigation is proposed.

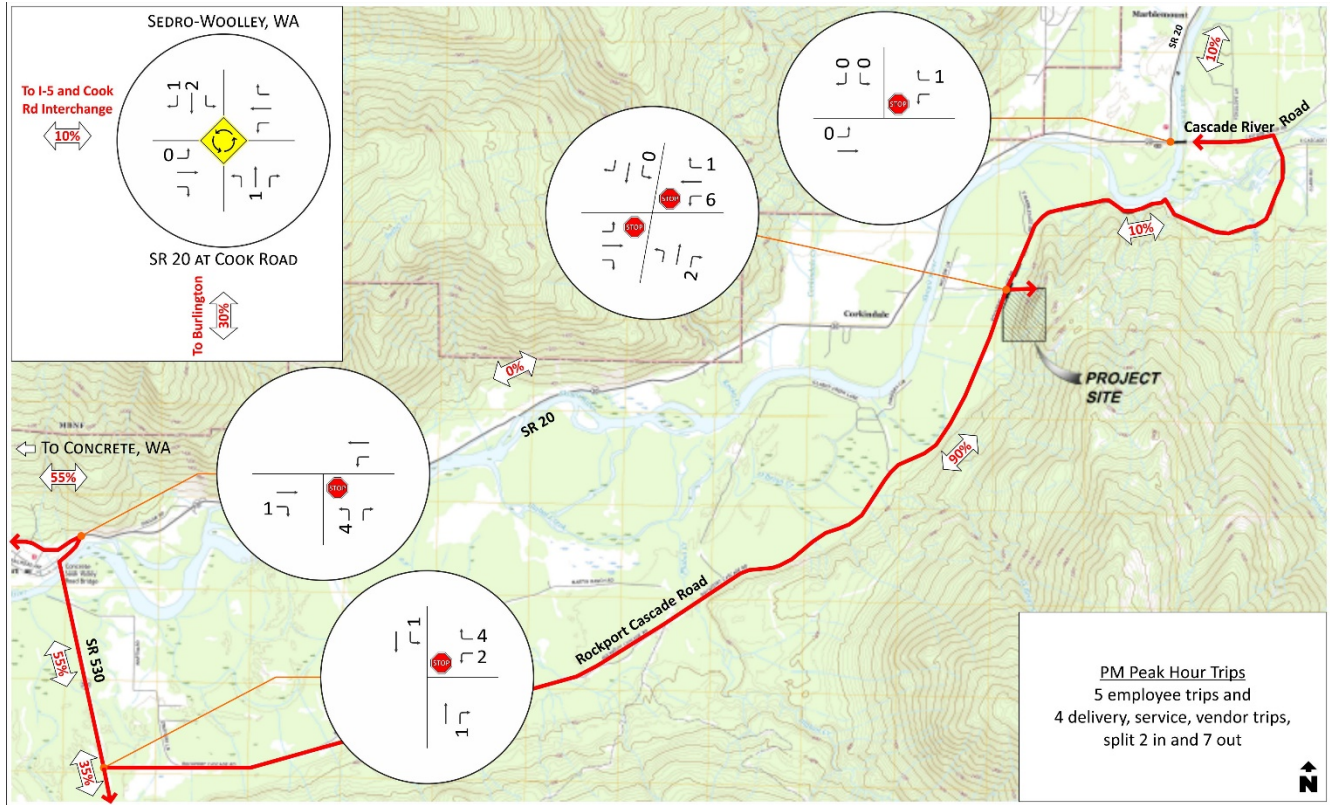
Appendix



Kiewit Truck Trip Forecast



Cunningham Crushing Truck Trip Forecast



Employee and Service, Vendor and Delivery Vehicle Trip Forecasts



Prepared for: **Transportation Solutions, Inc.**
Traffic Count Consultants, Inc.

Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: SR 530 & N Cascades Hwy (SR 20)

Date of Count: Tues 12/18/2018

Location: Rockport, Washington

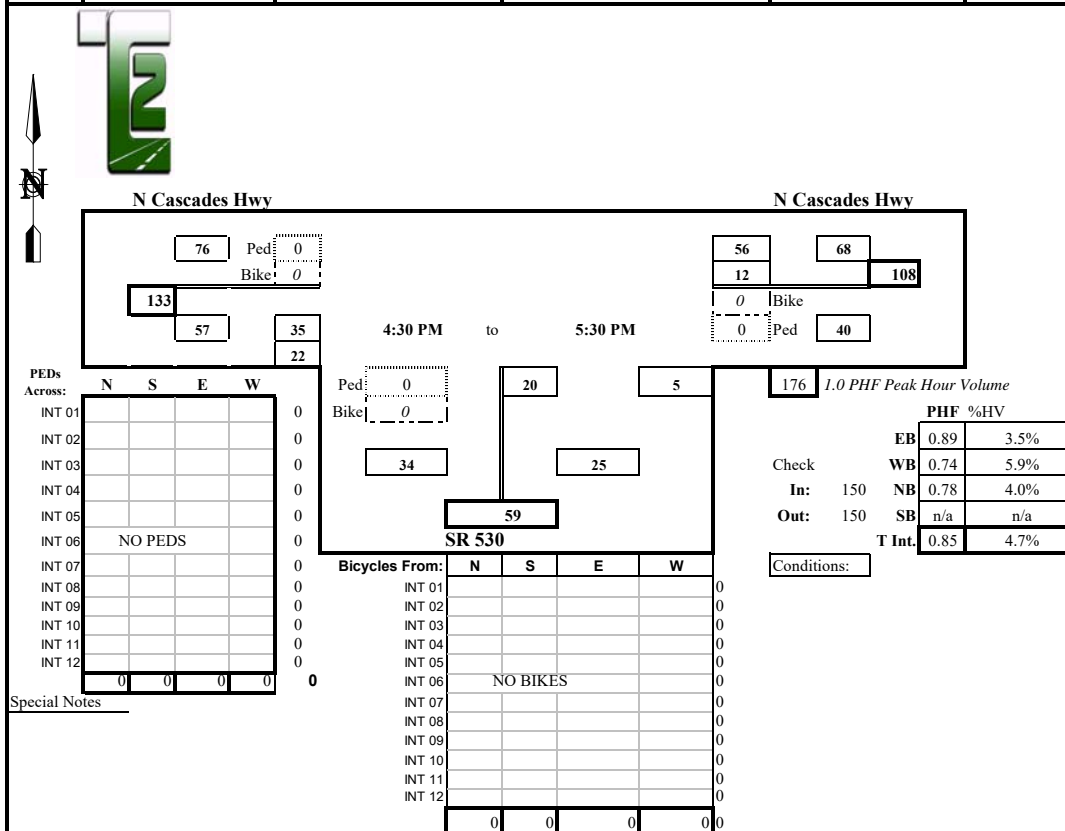
Checked By: Jess

Time Interval Ending at	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	1	7	0	1	0	1	5	0	0	0	6	2	22
4:30 P	0	0	0	0	0	3	0	2	2	1	9	0	0	0	4	7	26
4:45 P	0	0	0	0	1	7	0	1	1	4	19	0	1	0	7	6	44
5:00 P	0	0	0	0	0	4	0	2	0	4	13	0	1	0	11	3	37
5:15 P	0	0	0	0	0	4	0	0	1	2	11	0	0	0	9	7	33
5:30 P	0	0	0	0	0	5	0	2	2	2	13	0	0	0	8	6	36
5:45 P	0	0	0	0	0	5	0	0	0	0	7	0	0	0	3	4	19
6:00 P	0	0	0	0	1	3	0	1	0	3	7	0	0	0	2	1	17
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total Survey	0	0	0	0	3	38	0	9	6	17	84	0	2	0	50	36	234
--------------	---	---	---	---	---	----	---	---	---	----	----	---	---	---	----	----	-----

Peak Hour: 4:30 PM to 5:30 PM

Total	0	0	0	0	1	20	0	5	4	12	56	0	2	0	35	22	150
Approach	0				25				68				57				150
%HV	n/a				4.0%				5.9%				3.5%				4.7%
PHF	n/a				0.78				0.74				0.89				0.85





Traffic Count Consultants, Inc.

DBE/WBE

Vehicle Volume Summary

Phone: (253) 770-1407 E-Mail: Team@TC2inc.com

Intersection: SR 530 & Rockport Park Rd & Railroad Ave
Location: Rockport, Washington

Date of Count: Tues 12/18/2018
Checked By: Jess

Time Interval Ends at	From North (SB) SR 530						0						From E (WB) 0						From South (NB) SR 530						From W (EB) Rockport Park Rd						From NW (SEB) Railroad Ave						Interval Total
	T	HR	SR	Thru	L	0	0	0	0	0	0	T	0	R	SR	Thru	L	T	R	0	Thru	SL	HL	T	R	Thru	0	SL	HL	T	HR	SR	0	SL	HL		
4:15 P	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
4:30 P	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	14	
4:45 P	0	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17	
5:00 P	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0	1	0	0	0	0	0	0	1	0	0	0	17	
5:15 P	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	15	
5:30 P	1	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	17	
5:45 P	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	1	0	0	0	10	
6:00 P	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	1	0	0	8	
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Total Survey	1	1	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	44	7	0	0	2	0	0	0	0	1	0	6	0	0	1	111
4:30 P to 5:30 P Peak Hour Summary																																					
Total	1	1	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	25	3	0	0	1	0	0	0	0	0	4	0	0	0	66	
Approach	33						0						0						28						1						4						66
%HV	3.0%						n/a						n/a						3.6%						n/a						n/a						3.0%
PHF	0.92						n/a						n/a						0.78						0.25						0.50						0.97
Peds Total Survey	0						0						0						0						0						0						
Prepared For:	Transportation Solutions, Inc. TSI18155M_02																																				

Pedestrians

Int'l...	N	S	E	W	NW	Totals
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
	0	0	0	0	0	0

Bicycles

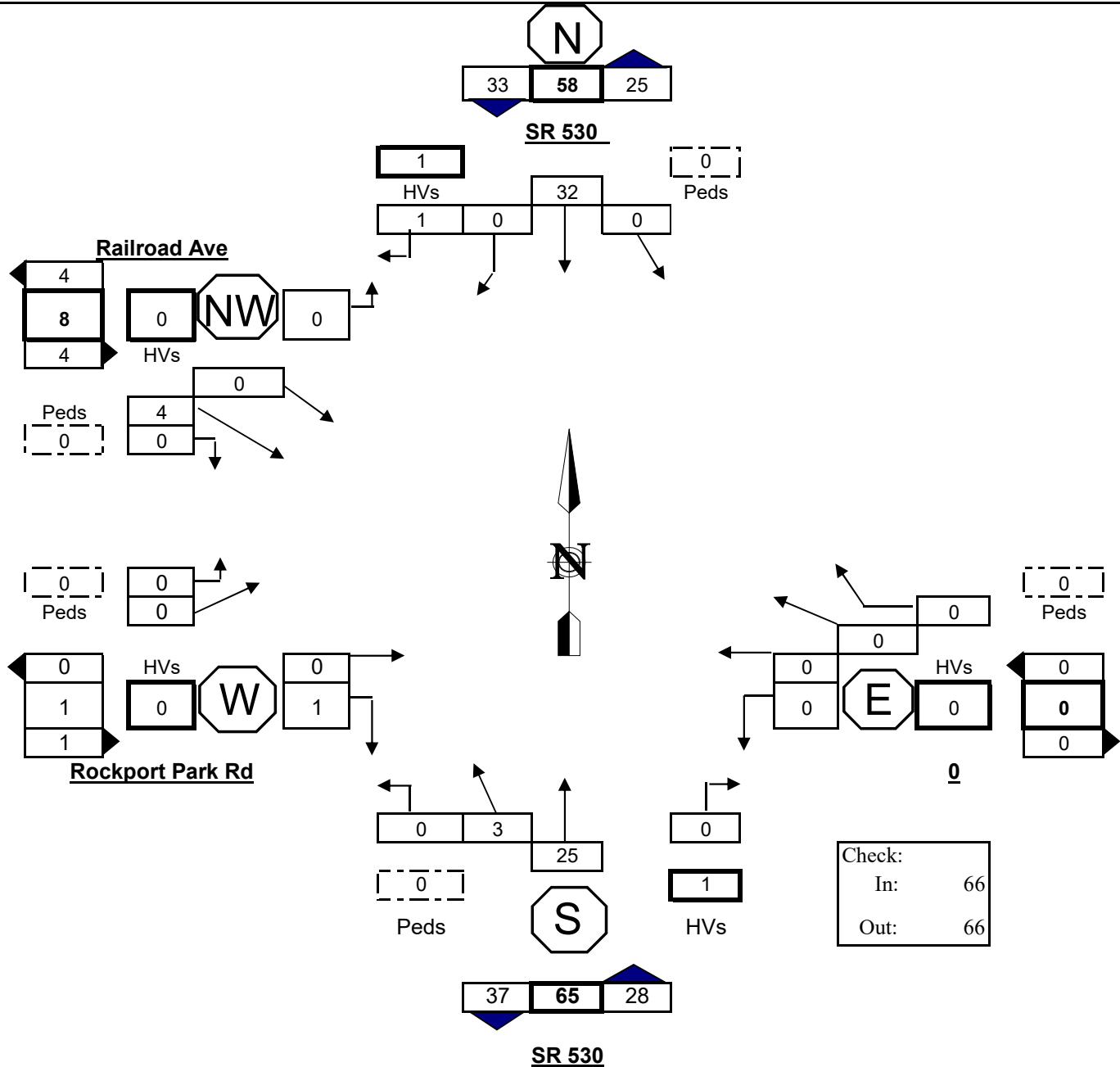
Intv'l...	N	S	E	W	NW	Totals
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
	0	0	0	0	0	0



Traffic Count Consultants, Inc.

DBE/WBE

Phone: (253) 770-1407 E-Mail: Team@TC2inc.com



Intersection: SR 530 & Rockport Park Rd & Railroad Ave

Location: Rockport, Washington

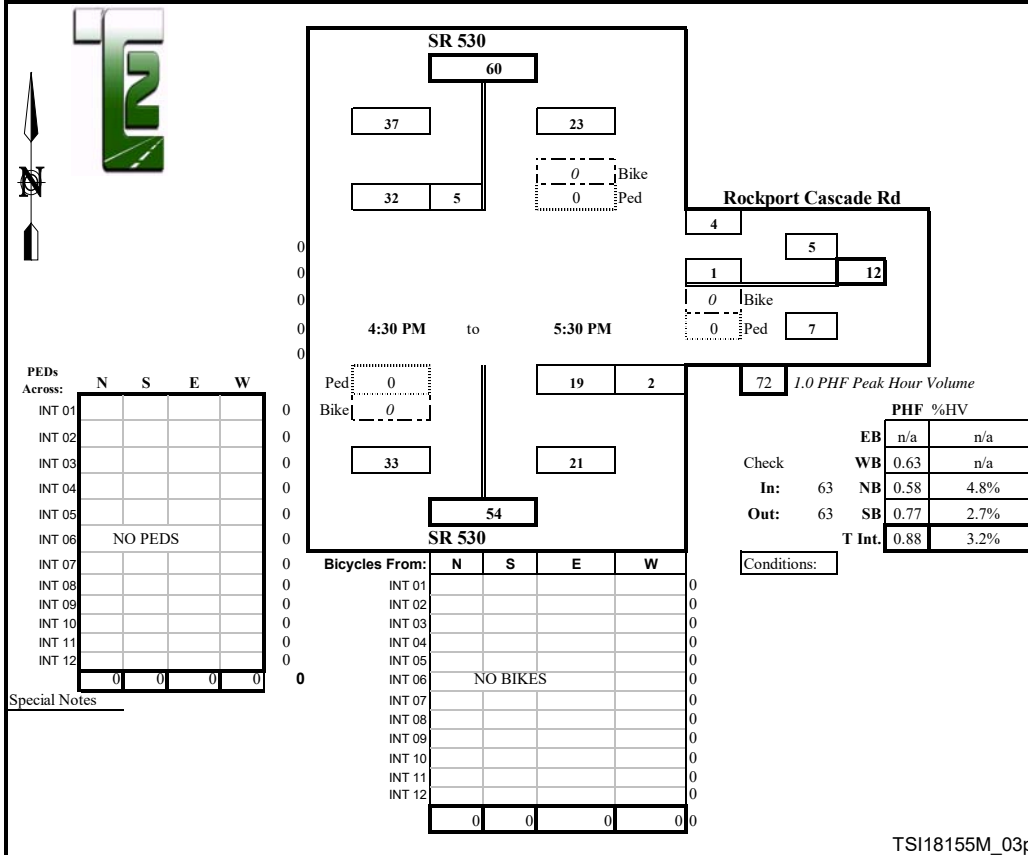
Date of Count: Tues 12/18/2018

Peak Period: 4:30 P - 5:30 P

Checked By: Jess

Prepared For: Transportation Solutions, Inc.

	%HV	PHF
SB	3.0%	0.92
	n/a	n/a
WB	n/a	n/a
NB	3.6%	0.78
EB	n/a	0.25
SEB	n/a	0.50
Intersection	3.0%	0.97





Prepared for:

Transportation Solutions, Inc.

Traffic Count Consultants, Inc.

Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: N Cascades Hwy (SR 20) & Cascade River Rd/N Cascades Hwy (SR 20)

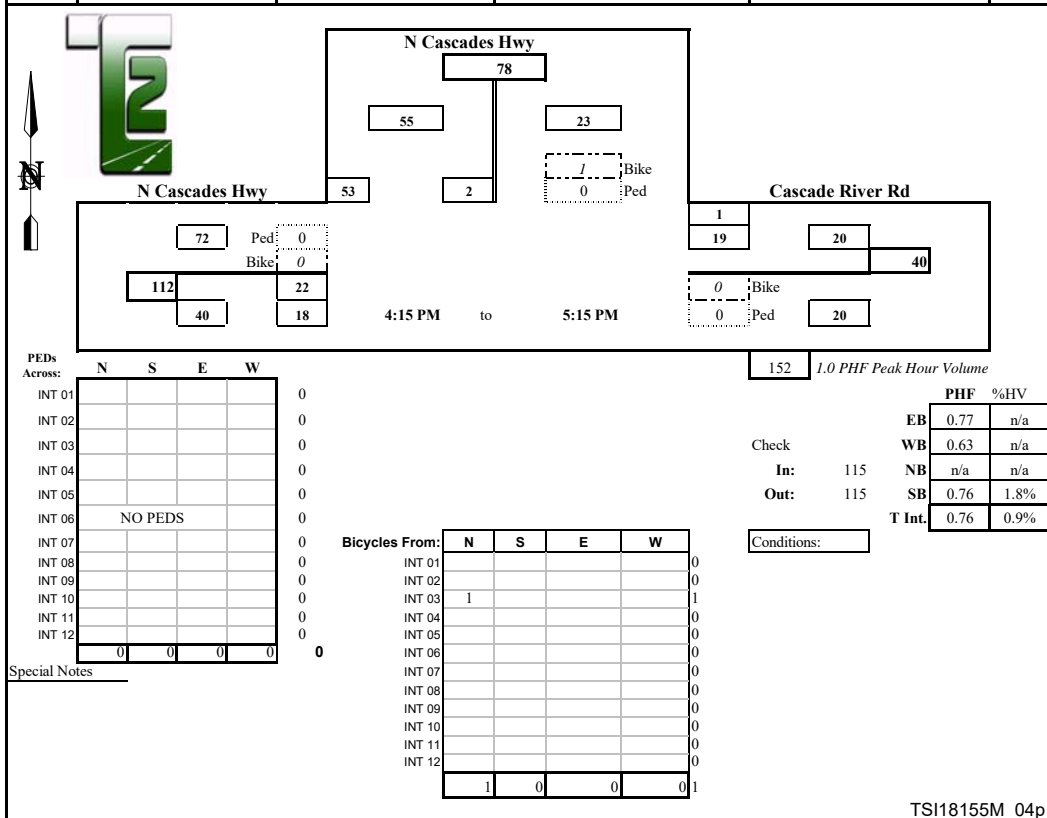
Date of Count: Tues 12/18/2018

Location: Rockport, Washington

Checked By: Jess

Time Interval	From North on (SB) N Cascades Hwy				From South on (NB) 0				From East on (WB) Cascade River Rd				From West on (EB) N Cascades Hwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	1	0	5	0	0	0	0	1	0	7	1	0	4	4	0	22
4:30 P	1	2	0	15	0	0	0	0	0	0	8	0	0	7	6	0	38
4:45 P	0	0	0	18	0	0	0	0	0	0	3	1	0	4	4	0	30
5:00 P	0	0	0	10	0	0	0	0	0	0	4	0	0	3	5	0	22
5:15 P	0	0	0	10	0	0	0	0	0	0	4	0	0	8	3	0	25
5:30 P	0	1	0	8	0	0	0	0	0	0	3	1	0	4	3	0	20
5:45 P	0	0	0	9	0	0	0	0	0	0	1	0	0	6	2	0	18
6:00 P	0	0	0	1	0	0	0	0	0	0	2	0	0	4	1	0	8
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	1	4	0	76	0	0	0	0	1	0	32	3	0	40	28	0	183
Survey																	
Peak Hour: 4:15 PM to 5:15 PM																	
Total	1	2	0	53	0	0	0	0	0	0	19	1	0	22	18	0	115
Approach	55				0				20				40				115
%HV	1.8%				n/a				n/a				n/a				0.9%
PHF	0.76				n/a				0.63				0.77				0.76



TSI18155M_04p



Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Rockport Cascades Rd & Cascade River Rd

Date of Count: Tues 12/18/2018

Location: Rockport, Washington

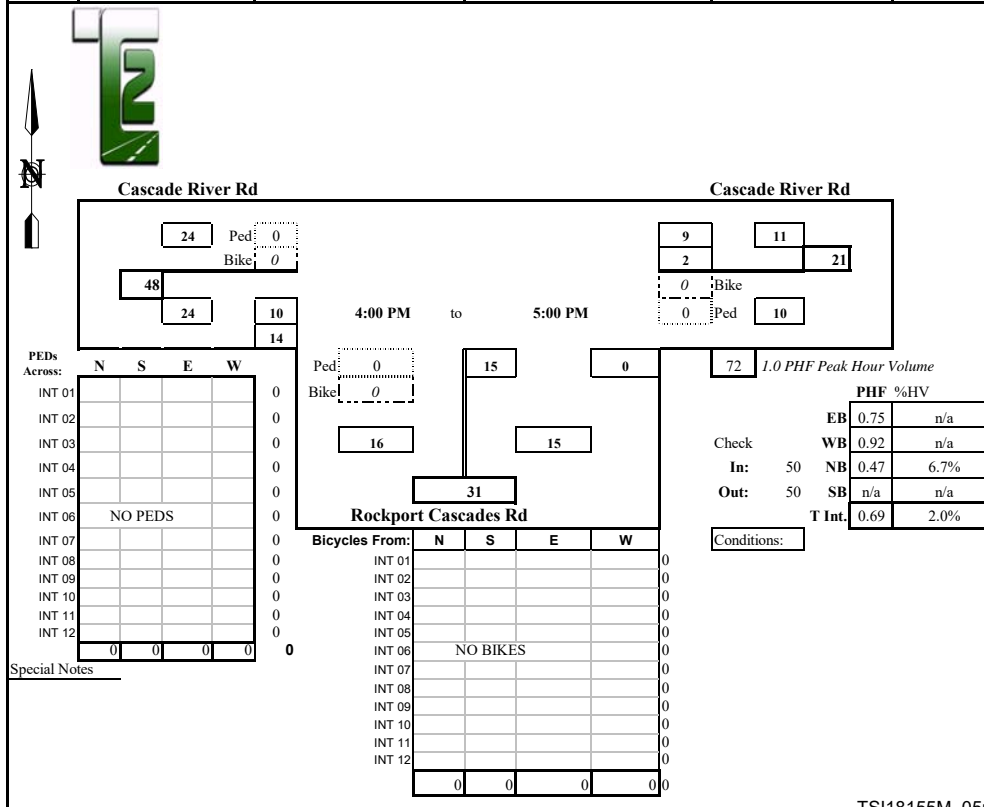
Checked By: Jess

Time Interval	From North on (SB) 0				From South on (NB) Rockport Cascades Rd				From East on (WB) Cascade River Rd				From West on (EB) Cascade River Rd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	1	8	0	0	0	0	3	0	0	0	4	3	18
4:30 P	0	0	0	0	0	2	0	0	0	1	2	0	0	0	4	4	13
4:45 P	0	0	0	0	0	3	0	0	0	1	1	0	0	0	1	4	10
5:00 P	0	0	0	0	0	2	0	0	0	0	3	0	0	0	1	3	9
5:15 P	0	0	0	0	0	2	0	0	0	0	1	0	0	0	3	0	6
5:30 P	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	4
5:45 P	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	3
6:00 P	0	0	0	0	0	2	0	0	0	0	1	0	0	0	1	0	4
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total Survey	0	0	0	0	1	22	0	0	0	2	11	0	0	0	16	16	67
--------------	---	---	---	---	---	----	---	---	---	---	----	---	---	---	----	----	----

Peak Hour: 4:00 PM to 5:00 PM

Total	0	0	0	0	1	15	0	0	0	2	9	0	0	0	10	14	50
Approach	0				15				11				24				50
%HV	n/a				6.7%				n/a				n/a				2.0%
PHF	n/a				0.47				0.92				0.75				0.69



TS18155M_05p

Rockport Cascade Hwy
East of SR 530

Traffic Study Result



Update Date: 6/13/2018 ☒ Update Road Log? (All Through Lanes Studied required)

Lanes Studied: All through lanes

Equipment ID: Q0174KDK

Studied By: SP

Weather:

Study Purpose:

Data File: 08700099122Jun2017.EC0

Comment: AADT DIST 3

Average Daily Traffic

Volume: 197

Year (4 digit): 2017

Source: County Count

Time Period

Begin Date: 6/20/2017 End Date: 6/22/2017

Begin Day: Tuesday End Day: Thursday

Begin Time: 12:00 AM End Time: 12:00 AM

Percentages or Counts

Numbers are: Percents

Percent Count

Total Truck: 7 14

Truck-Single: 6 12

Truck-Double: 1 2

Truck-Train:

Bus:

RV:

Peak Hours

AM Volume: 16 Start Hour: 10:00 AM

PM Volume: 22 Start Hour: 12:00 PM

Speed

Maximum: 60.20 Mode:

Pace High: 46.00 Mean: 39.00

85th Percentile: 46.50 Median: 39.00

Truck Route

Gross Annual Tons: Calc G.A.T.

Truck Route Class:

Truck Route Season:

Truck Route recommendation
based on WSDOT specs

Close

Print

Clone

Delete

Save

Rockport Cascade Hwy
South of Cascade River Rd

Mobility Print Screen : 1/10/2019 8:26:52 AM

Traffic Study Result



Update Date:

6/13/2018

☒ Update Road Log? (All Through Lanes Studied required)

Lanes Studied:

All through lanes

Equipment ID: Q0314VNR

Studied By:

SP

Weather:

Study Purpose:

Data File: 08700001022Jun2017.EC0

Comment:

AADT DIST 3

Average Daily Traffic

Volume: 297

Year (4 digit): 2017

Source: County Count

Time Period

Begin Date: 6/20/2017



End Date: 6/22/2017



Begin Day: Tuesday

End Day: Thursday

Begin Time: 12:00 AM

End Time: 12:00 AM

Percentages or Counts

Numbers are:

Percent



Percent

Count

Total Truck: 10

30

Truck-Single: 10

30

Truck-Double:

Truck-Train:

Bus:

RV:

Peak Hours

AM Volume: 33

Start Hour: 11:00 AM

PM Volume: 34

Start Hour: 2:00 PM

Speed

Maximum: 48.60

Mode:

Pace High: 26.00

Mean: 24.90

85th Percentile: 32.40

Median: 24.00

Truck Route

Gross Annual Tons: 52,500

Calc G.A.T.

Truck Route Class:

Truck Route Season:

Truck Route recommendation
based on WSDOT specs

Close



Print



Clone



Delete



Save



CLAS Collision Detail Report

8700 ROCKPORT CASCADE ROAD

Report # Date Severity Intersection
E837221 09/06/18 Property Damage Only Not at Intersection and Not Related

Collision Type
Fixed object/Vehicle overturned
Object Struck
Roadway Ditch

1 Motorcycle

Actions: Going Straight Ahead

Seq of Events: Ran off the Road/Collision Involving Fixed Object/Overturn (Rollover)

Contrib Circ: None

Direction From: N

Report #	Date	Severity	Intersection	Collision Type	Object Struck
1.500	2520738	05/24/14 Injury	Not at Intersection and Not Related	Fixed object	Utility Pole or Box

1 Passenger Car

Actions: Going Straight Ahead

Seq of Events: Ran off the Road/Collision Involving Fixed Object

Contrib Circ: Apparently Asleep/Apparently Fatigued

Direction From: S

Report #	Date	Severity	Intersection	Collision Type	Object Struck
4.113	2915252	10/01/16 Property Damage Only	At Intersection and Related-@ Rd #08819	Entering at angle	

1 Pickup or Panel Truck or Vanette under 10000 lb

Actions: Making Left Turn

Seq of Events: Collision Involving Motor Vehicle in Transport

Contrib Circ: Did Not Grant ROW to Vehicle/Improper Turn/Inattention

2 Pickup or Panel Truck or Vanette under 10000 lb

Actions: Going Straight Ahead

Seq of Events: Collision Involving Motor Vehicle in Transport/Ran off the Road

Direction From: W

Contrib Circ:

Report #	Date	Severity	Intersection	Collision Type	Object Struck
9.540	E416570	04/15/15 Injury	Not at Intersection and Not Related	Fixed object	Fence

1 Pickup or Panel Truck or Vanette under 10000 lb

Actions: Going Straight Ahead

Seq of Events: Ran off the Road/Collision Involving Fixed Object

Contrib Circ: Apparently Fatigued

Direction From: NE

Cascade River Rd
West of Rockport Hwy

Traffic Study Result



Update Date:

9/26/2018

☒ Update Road Log? (All Through Lanes Studied required)

Lanes Studied:

All through lanes

Equipment ID:

Q2572EBD

Studied By:

SP

Weather:

Study Purpose:

Data File:

97950006016Jun2017.EC0

Comment:

AADT

Average Daily Traffic

Volume:

430

Year (4 digit):

2017

Source:

County Count

Time Period

Begin Date:

6/13/2017

End Date:

6/15/2017

Begin Day:

Tuesday

End Day:

Thursday

Begin Time:

12:00 AM

End Time:

12:00 AM

Percentages or Counts

Numbers are:

Percent

Percent

Count

Total Truck:

8

34

Truck-Single:

8

34

Truck-Double:

Truck-Train:

Bus:

RV:

Peak Hours

AM Volume:

48

Start Hour:

10:00 AM

PM Volume:

41

Start Hour:

1:00 PM

Speed

Maximum:

73.80

Mode:

Pace High:

36.00

Mean:

32.60

85th Percentile:

40.00

Median:

32.00

Truck Route

Gross Annual Tons:

Calc G.A.T.

Truck Route Class:

Truck Route Season:

Truck Route recommendation
based on WSDOT specs

Close



Print



Clone



Delete



Save



CLAS Collision Detail Report

97950 CASCAD RIVER ROAD

Report # Date Severity Intersection
E360315 09/04/14 Property Damage Only Not at Intersection and Not Related

Collision Type
Fixed object/Fixed object

Object Struck
Over Embankment
- No Guardrail
Present/Tree or
Stump (stationary)

1 Pickup or Panel Truck or Vanette under 10000 lb

Direction From: E

Actions: Going Straight Ahead

Seq of Events: Ran off the Road/Collision Involving Fixed Object

Contrib Circ: Inattention

Report #	Date	Severity	Intersection	Collision Type	Object Struck
E532994	04/10/16	Property Damage Only	Not at Intersection and Not Related	Fixed object/Vehicle overturned	Roadway Ditch

1 Pickup or Panel Truck or Vanette under 10000 lb

Direction From: E

Actions: Going Straight Ahead

Seq of Events: Ran off the Road/Collision Involving Fixed Object/Overturn (Rollover)

Contrib Circ: Under Influence of Alcohol

Peak Hour Report

YEAR 2016



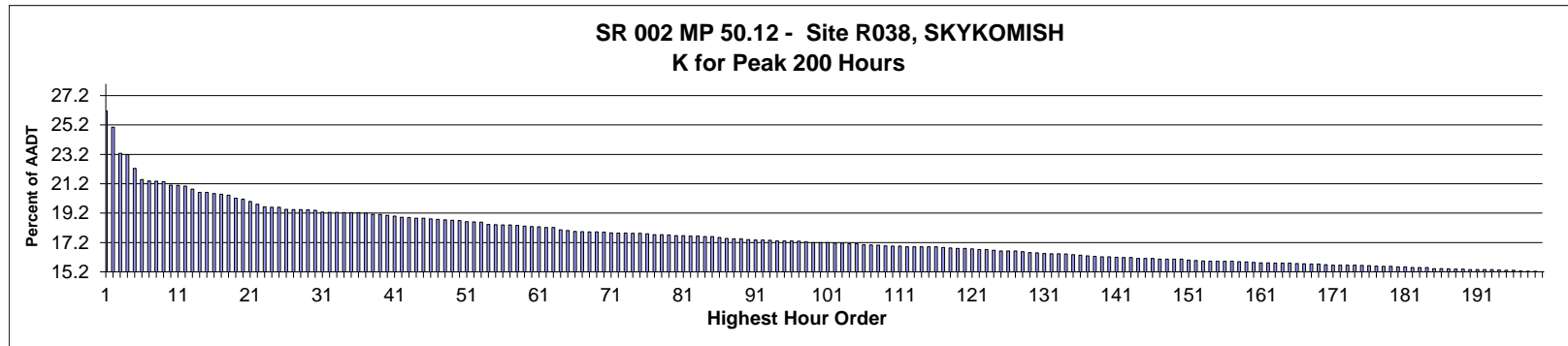
**Washington State
Department of Transportation**

In cooperation with the
United States Department of Transportation
Federal Highway Administration

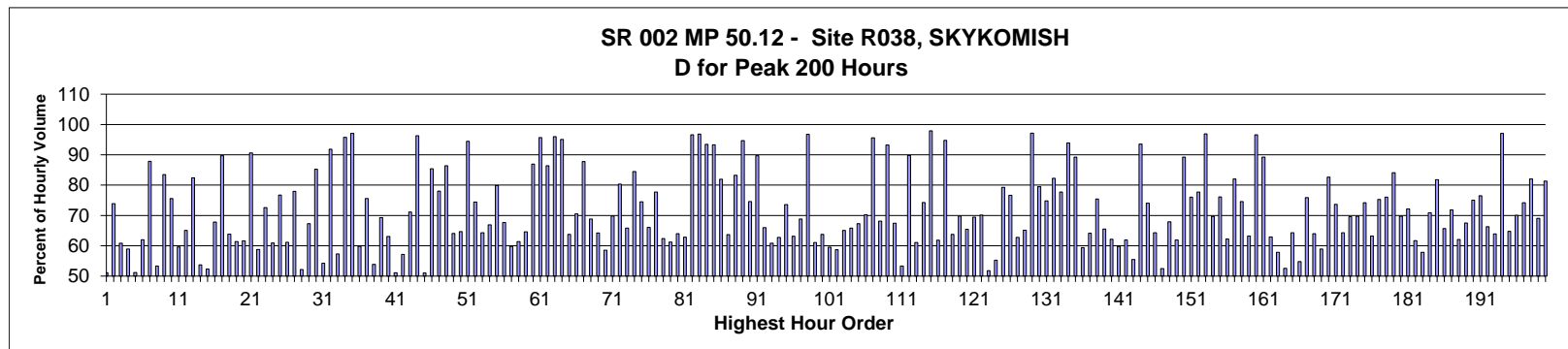
Transportation Data, GIS & Modeling Office

tdgmoptrprocessing@wsdot.wa.gov

(360) 570-2392 MS:47380






AADT= 5,741 K 30 FACTOR= 19.40 K 100 FACTOR= 17.19 K 200 FACTOR= 15.22 D 30 FACTOR= 85.28



MO	DY	YR	DAY OF WK	HR	HR VOL	PERCENT OF AADT	HOUR NUMBER	AADT	EAST VOLUME	WEST VOLUME	PERCENT EAST IS OF TOTAL VOLUME	PERCENT WEST IS OF TOTAL VOLUME
12	26	2016	2	16	1,501	26.15	1	5,741	734	767	48.90	51.10
1	2	2016	7	16	1,438	25.05	2	5,741	375	1,063	26.08	73.92
1	2	2016	7	15	1,336	23.27	3	5,741	523	813	39.15	60.85
1	1	2016	6	16	1,331	23.18	4	5,741	547	784	41.10	58.90
1	1	2016	6	15	1,277	22.24	5	5,741	623	654	48.79	51.21
12	30	2016	6	17	1,233	21.48	6	5,741	469	764	38.04	61.96
4	17	2016	1	17	1,228	21.39	7	5,741	149	1,079	12.13	87.87
1	2	2016	7	14	1,227	21.37	8	5,741	573	654	46.70	53.30
1	2	2016	7	17	1,225	21.34	9	5,741	202	1,023	16.49	83.51
1	1	2016	6	17	1,212	21.11	10	5,741	296	916	24.42	75.58
12	30	2016	6	16	1,211	21.09	11	5,741	489	722	40.38	59.62
12	26	2016	2	17	1,208	21.04	12	5,741	422	786	34.93	65.07
1	18	2016	2	15	1,196	20.83	13	5,741	210	986	17.56	82.44
1	2	2016	7	13	1,183	20.61	14	5,741	635	548	53.68	46.32
12	30	2016	6	15	1,183	20.61	15	5,741	564	619	47.68	52.32
12	26	2016	2	12	1,179	20.54	16	5,741	800	379	67.85	32.15

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	55	30	145	50	15
Future Vol, veh/h	90	55	30	145	50	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	74	74	78	78
Heavy Vehicles, %	4	4	6	6	4	4
Mvmt Flow	101	62	41	196	64	19




Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	163
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.16
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.254
Pot Cap-1 Maneuver	-	-	1392
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1392
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	746	-	-	1392	-
HCM Lane V/C Ratio	0.112	-	-	0.029	-
HCM Control Delay (s)	10.4	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	5	65	80	5
Future Vol, veh/h	0	5	5	65	80	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	78	78	92	92
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	10	6	83	87	5




Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	185	90	92
Stage 1	90	-	-
Stage 2	95	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	809	973	1515
Stage 1	939	-	-
Stage 2	934	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	806	973	1515
Mov Cap-2 Maneuver	806	-	-
Stage 1	935	-	-
Stage 2	934	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1515	-	973	-	-
HCM Lane V/C Ratio	0.004	-	0.01	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 TWSC
3: SR 530 & Rockport Cascade Road

2018 Existing
Timing Plan: PM




Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	65	5	5	80
Future Vol, veh/h	5	5	65	5	5	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	58	58	77	77
Heavy Vehicles, %	0	0	5	5	3	3
Mvmt Flow	8	8	112	9	6	104
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	233	117	0	0	121	0
Stage 1	117	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	760	941	-	-	1460	-
Stage 1	913	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	757	941	-	-	1460	-
Mov Cap-2 Maneuver	757	-	-	-	-	-
Stage 1	913	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	7.4	0	0.4			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	1514	1460	-	
HCM Lane V/C Ratio	-	-	0.01	0.004	-	
HCM Control Delay (s)	-	-	7.4	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM 2010 TWSC
5: Rockport Cascade Road & Cascade River Road

2018 Existing
Timing Plan: PM

Intersection

Int Delay, s/veh 4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	15	5	10	20	0
Future Vol, veh/h	10	15	5	10	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	92	92	47	47
Heavy Vehicles, %	0	0	0	0	7	7
Mvmt Flow	13	20	5	11	43	0





Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	33
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1592
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1592
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	951	-	-	1592	-
HCM Lane V/C Ratio	0.045	-	-	0.003	-
HCM Control Delay (s)	9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection




Int Delay, s/veh 0.9




Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	5	70	20	5	175
Future Vol, veh/h	20	5	70	20	5	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	76	76	63	63
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	26	6	92	26	8	278

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	399	105	0
Stage 1	105	-	-
Stage 2	294	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	611	955	-
Stage 1	924	-	-
Stage 2	761	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	608	955	-
Mov Cap-2 Maneuver	608	-	-
Stage 1	924	-	-
Stage 2	757	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.2
HCM LOS	B		




Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	656	1483
HCM Lane V/C Ratio	-	-	0.049	0.005
HCM Control Delay (s)	-	-	10.8	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	95	60	30	155	55	15
Future Vol, veh/h	95	60	30	155	55	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	74	74	78	78
Heavy Vehicles, %	4	4	6	6	4	4
Mvmt Flow	107	67	41	209	71	19
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	174	0	432	141
Stage 1	-	-	-	-	141	-
Stage 2	-	-	-	-	291	-
Critical Hdwy	-	-	4.16	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.254	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1379	-	577	902
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1379	-	557	902
Mov Cap-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	728	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		10.8	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	709	-	-	1379	-	
HCM Lane V/C Ratio	0.127	-	-	0.029	-	
HCM Control Delay (s)	10.8	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-	

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	5	70	85	5
Future Vol, veh/h	0	5	5	70	85	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	78	78	92	92
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	10	6	90	92	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	197	95	97	0	-	0
Stage 1	95	-	-	-	-	-
Stage 2	102	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	796	967	1509	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	793	967	1509	-	-	-
Mov Cap-2 Maneuver	793	-	-	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.8	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1509	-	967	-	-	
HCM Lane V/C Ratio	0.004	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	8.8	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 2010 TWSC
3: SR 530 & Rockport Cascade Road

2026 Without-Project
Timing Plan: PM




Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	70	5	5	85
Future Vol, veh/h	5	5	70	5	5	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	58	58	77	77
Heavy Vehicles, %	0	0	5	5	3	3
Mvmt Flow	8	8	121	9	6	110
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	248	126	0	0	130	0
Stage 1	126	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	745	930	-	-	1449	-
Stage 1	905	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	742	930	-	-	1449	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	7.5	0	0.4			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	1484	1449	-	
HCM Lane V/C Ratio	-	-	0.011	0.004	-	
HCM Control Delay (s)	-	-	7.5	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM 2010 TWSC
5: Rockport Cascade Road & Cascade River Road

2026 Without-Project
Timing Plan: PM

Intersection





Int Delay, s/veh 4.6




Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	15	5	10	20	0
Future Vol, veh/h	10	15	5	10	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	92	92	47	47
Heavy Vehicles, %	0	0	0	0	7	7
Mvmt Flow	13	20	5	11	43	0




Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	33
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1592
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1592
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	951	-	-	1592	-
HCM Lane V/C Ratio	0.045	-	-	0.003	-
HCM Control Delay (s)	9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-




Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	5	75	20	5	190
Future Vol, veh/h	20	5	75	20	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	76	76	63	63
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	26	6	99	26	8	302
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	430	112	0	0	125	0
Stage 1	112	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	586	947	-	-	1474	-
Stage 1	918	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	583	947	-	-	1474	-
Mov Cap-2 Maneuver	583	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	632	1474	-	
HCM Lane V/C Ratio	-	-	0.051	0.005	-	
HCM Control Delay (s)	-	-	11	7.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	95	66	30	155	64	15
Future Vol, veh/h	95	66	30	155	64	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	74	74	78	78
Heavy Vehicles, %	4	4	6	6	4	4
Mvmt Flow	107	74	41	209	82	19
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	181	0	435	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	291	-
Critical Hdwy	-	-	4.16	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.254	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1371	-	575	898
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1371	-	555	898
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	728	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		11.2	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	685	-	-	1371	-	
HCM Lane V/C Ratio	0.148	-	-	0.03	-	
HCM Control Delay (s)	11.2	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-	

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	5	79	91	5
Future Vol, veh/h	0	5	5	79	91	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	78	78	92	92
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	10	6	101	99	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	215	102	104	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	778	959	1500	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	775	959	1500	-	-	-
Mov Cap-2 Maneuver	775	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.8	0.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1500	-	959	-	-	
HCM Lane V/C Ratio	0.004	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	8.8	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 2010 TWSC
3: SR 530 & Rockport Cascade Road

2026 With-Project
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	14	70	7	11	85
Future Vol, veh/h	8	14	70	7	11	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	58	58	77	77
Heavy Vehicles, %	0	0	5	5	3	3
Mvmt Flow	13	22	121	12	14	110
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	265	127	0	0	133	0
Stage 1	127	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	728	929	-	-	1446	-
Stage 1	904	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	721	929	-	-	1446	-
Mov Cap-2 Maneuver	721	-	-	-	-	-
Stage 1	904	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	7.5	0	0.9			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 1460	1446	-		
HCM Lane V/C Ratio	-	- 0.024	0.01	-		
HCM Control Delay (s)	-	- 7.5	7.5	0		
HCM Lane LOS	-	- A	A	A		
HCM 95th %tile Q(veh)	-	- 0.1	0	-		




HCM 2010 TWSC
4: Rockport Cascade Road & Driveway/Site Access

2026 With-Project
Timing Plan: PM

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	5	12	0	1	5	15	8	0	15	5
Future Vol, veh/h	5	0	5	12	0	1	5	15	8	0	15	5
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	50	50	50	50	50	50	50	50	50	60	60	60
Heavy Vehicles, %	0	0	0	100	100	100	5	5	5	5	5	5
Mvmt Flow	10	0	10	24	0	2	10	30	16	0	25	8
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	88	95	29	92	91	38	33	0	0	46	0	0
Stage 1	29	29	-	58	58	-	-	-	-	-	-	-
Stage 2	59	66	-	34	33	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	8.1	7.5	7.2	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	7.1	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	7.1	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	4.4	4.9	4.2	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	902	799	1052	703	646	812	1560	-	-	1543	-	-
Stage 1	993	875	-	756	688	-	-	-	-	-	-	-
Stage 2	958	844	-	781	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	895	793	1052	692	641	812	1560	-	-	1543	-	-
Mov Cap-2 Maneuver	895	793	-	692	641	-	-	-	-	-	-	-
Stage 1	986	875	-	751	683	-	-	-	-	-	-	-
Stage 2	949	838	-	774	708	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	8.8		10.3			1.3			0			
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1560	-	-	967	700	1543	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.021	0.037	-	-	-				
HCM Control Delay (s)	7.3	0	-	8.8	10.3	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				





HCM 2010 TWSC
5: Rockport Cascade Road & Cascade River Road

2026 With-Project
Timing Plan: PM

Intersection						
Int Delay, s/veh	4.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	15	5	10	21	0
Future Vol, veh/h	10	15	5	10	21	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	92	92	47	47
Heavy Vehicles, %	0	0	0	0	7	7
Mvmt Flow	13	20	5	11	45	0
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	33	0	44	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	4.1	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.2	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	1592	-	954	1040
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	989	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1592	-	951	1040
Mov Cap-2 Maneuver	-	-	-	-	951	-
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	986	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	2.4		9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	951	-	-	1592	-	
HCM Lane V/C Ratio	0.047	-	-	0.003	-	
HCM Control Delay (s)	9	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	6	75	20	5	190
Future Vol, veh/h	20	6	75	20	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	76	76	63	63
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	26	8	99	26	8	302

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	430	112	0
Stage 1	112	-	-
Stage 2	318	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	586	947	-
Stage 1	918	-	-
Stage 2	742	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	583	947	-
Mov Cap-2 Maneuver	583	-	-
Stage 1	918	-	-
Stage 2	738	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	640	1474
HCM Lane V/C Ratio	-	-	0.053	0.005
HCM Control Delay (s)	-	-	10.9	7.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0