

Reeck, Amanda

From: Eichelsdoerfer, Robert
Sent: Thursday, June 1, 2017 12:31 PM
To: Reeck, Amanda
Cc: Sandin, Randy
Subject: RE: KCDOT Road and Traffic Engineering comments based on July 20, 2016 meeting with the applicant

Good afternoon,

KCDOT Road and Traffic Engineering has reviewed the September 16, 2016 Gibson Traffic Consultants Comment Response Memorandum pertaining to the July 1, 2016 letter to the Raging River Quarry regarding entering sight distance (ESD) for the intersection of SE Carmichael Way and Preston Fall City Road SE. The County recommended the following:

1. Conduct clearing and grading operations within the Preston Fall City Road SE right-of-way to obtain the minimum of 610 feet ESD.
2. Re-locate the site access (SE Carmichael Way) to the south.
3. Conduct a speed study to ascertain if the 85th percentile speed is less than the design speed of 55 mph.
4. Other mitigation measures may be proposed.

The applicant chose item #4 and proposed 2 additional signs to be installed north and south of the SE Carmichael Way/Preston Fall City Road intersection that would state WATCH FOR TRUCK TRAFFIC.

This is not acceptable mitigation for the substandard ESD. Per a July 20, 2016 field visit, KCDOT Road and Traffic Engineering staff measured 530 feet of ESD to the north. This is only 80 feet short of the required 610 feet. Based on field observations, it appeared that clearing within the Preston Fall City Road right-of-way in conjunction with clearing on applicant property might yield 80 more feet of ESD. This option should be thoroughly investigated. Conducting a speed study is also a viable alternative. For instance, if a speed study showed the 85th percentile speed was 50 mph, then this would equate to an ESD of 555 feet which would only be 25 feet above the existing 530 feet. Per field observations, 25 feet of additional ESD would more than likely be obtained by some minor clearing within right-of-way.

KCDOT Road and Traffic Engineering recommends that either a speed study be conducted with possible clearing within the right-of-way to obtain the required ESD or that a thorough investigation be conducted of clearing and possible grading within King County right-of-way and on the applicant's property.

Please let me know if you have any questions.

Robert Eichelsdoerfer, PE, Senior Engineer, Road Services Division, King County Department of Transportation, 206-477-3652

24/7 Help Line 206-477-8100, maint.roads@kingcounty.gov, www.kingcounty.gov/roads



Gibson Traffic Consultants, Inc.

Transportation Planners and Traffic Engineers

COMMENT RESPONSE MEMORANDUM

To: Robert Eichelsdoerfer, Senior Engineer - King County
From: Matthew Palmer, PE *mjp*
Subject: Request for Additional Information
Project: Raging River Quarry, GRDE15-0166, GTC #15-137
Date: September 13, 2016

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SEP 27 2016

KING COUNTY
D.P.E.R.

This response memorandum is to provide additional information to address the comments in the letter from King County dated July 1, 2016.

- *The King County Traffic Engineer recommends the following: Precise measurement of the Entering Sight Distance (ESD) to the north along Preston Fall City Road SE must be done to show compliance with the minimum requirement of 610 feet per KCRDCS. If this is not met, the consultant must propose mitigation to improved ESD. The consultant may propose 1) clearing and grading within the right-of-way; 2) relocating the site access using only the southern portion of the SE Carmichael Road intersection with Preston-Fall City Road SE; 3) conduct a speed study to ascertain if the 85th percentile speed is less than the design speed of 55 mph. Other mitigation measures may be proposed.*

From the King County letter, "KCDOT Traffic Operations staff has installed two (2) Truck Crossing Symbol (W11-6) warning signs north and south of the intersection of SE Carmichael Road and Preston-Fall City Road SE."

The applicant has decided in lieu of providing survey data that shows the entering sight distance isn't met or conducting a speed study to show the speeds are lower that providing additional signing for southbound vehicles to better describe what drivers will encounter is the most appropriate mitigation. In the latest MUTCD the W11-6 sign is for snowmobiles but the W11-10 sign is for trucks. That sign shows a simple box truck silhouette; the signs are included in the attachments. The applicant is proposing additional signing posted with or before the W11-10 sign that reads "CAUTION WATCH FOR TRUCK TRAFFIC". As the safe stopping sight distance is met in both directions for the 55 mph design speed (45 mph posted speed plus the 10 mph modifier) it is anticipated that there will not be an increase in collisions with the continued use of the existing access configuration.

Attachments (A-1 to A-4)

COPY

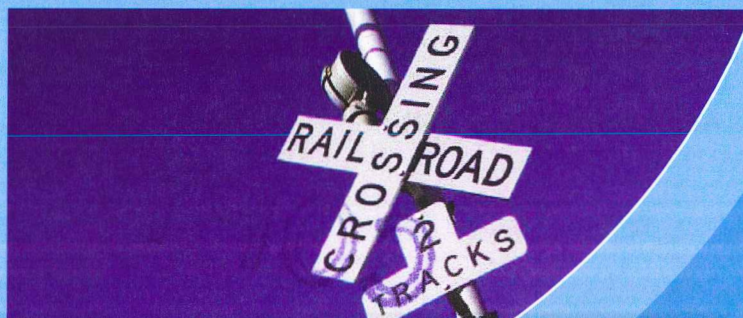
GRDE15-0166

Manual on Uniform Traffic Control Devices

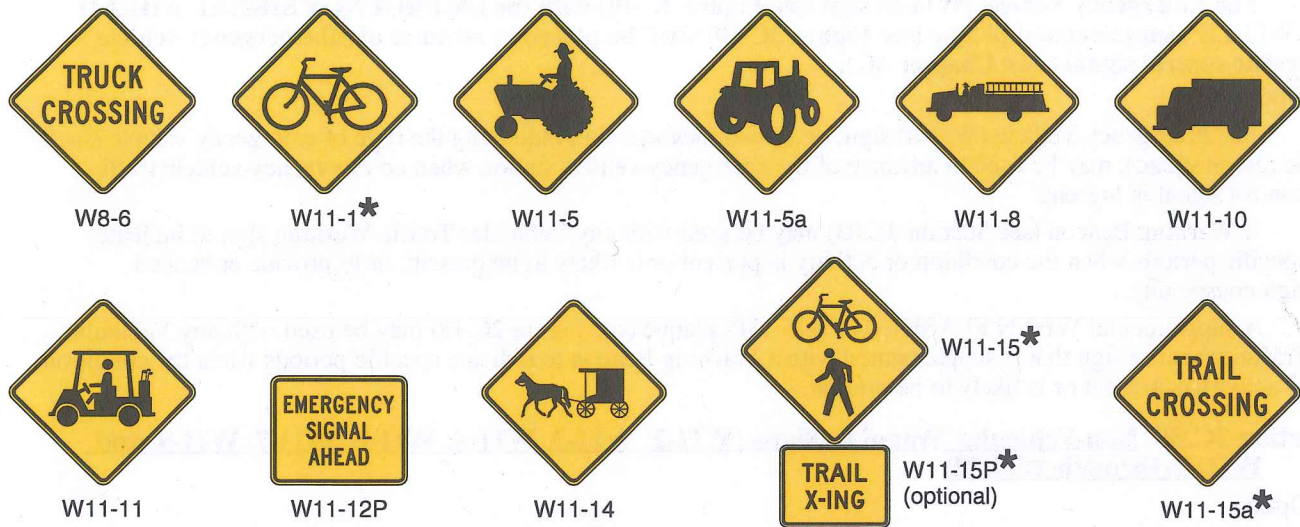
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Including Revision 1 dated May 2012
and Revision 2 dated May 2012



U.S. Department of Transportation
Federal Highway Administration

Figure 2C-10. Vehicular Traffic Warning Signs and Plaques

* A fluorescent yellow-green background color may be used for this sign or plaque.

Support:

- 02 These locations might be relatively confined or might occur randomly over a segment of roadway.

Guidance:

- 03 Vehicular Traffic Warning signs should be used only at locations where the road user's sight distance is restricted, or the condition, activity, or entering traffic would be unexpected.
- 04 If the condition or activity is seasonal or temporary, the Vehicular Traffic Warning sign should be removed or covered when the condition or activity does not exist.

Option:

- 05 The combined Bicycle/Pedestrian (W11-15) sign may be used where both bicyclists and pedestrians might be crossing the roadway, such as at an intersection with a shared-use path. A TRAIL X-ING (W11-15P) supplemental plaque (see Figure 2C-10) may be mounted below the W11-15 sign. The TRAIL CROSSING (W11-15a) sign may be used to warn of shared-use path crossings where pedestrians, bicyclists, and other user groups might be crossing the roadway.
- 06 The W11-1, W11-15, and W11-15a signs and their related supplemental plaques may have a fluorescent yellow-green background with a black legend and border.
- 07 Supplemental plaques (see Section 2C.53) with legends such as AHEAD, XX FEET, NEXT XX MILES, or SHARE THE ROAD may be mounted below Vehicular Traffic Warning signs to provide advance notice to road users of unexpected entries.

Guidance:

- 08 If used in advance of a pedestrian and bicycle crossing, a W11-15 or W11-15a sign should be supplemented with an AHEAD or XX FEET plaque to inform road users that they are approaching a point where crossing activity might occur.

Standard:

- 09 If a post-mounted W11-1, W11-11, W11-15, or W11-15a sign is placed at the location of the crossing point where golf carts, pedestrians, bicyclists, or other shared-use path users might be crossing the roadway, a diagonal downward pointing arrow (W16-7P) plaque (see Figure 2C-12) shall be mounted below the sign. If the W11-1, W11-11, W11-15, or W11-15a sign is mounted overhead, the W16-7P supplemental plaque shall not be used.

Option:

- 10 The crossing location identified by a W11-1, W11-11, W11-15, or W11-15a sign may be defined with crosswalk markings (see Section 3B.18).

Standard:

- 11 The Emergency Vehicle (W11-8) sign (see Figure 2C-10) with the EMERGENCY SIGNAL AHEAD (W11-12P) supplemental plaque (see Figure 2C-10) shall be placed in advance of all emergency-vehicle traffic control signals (see Chapter 4G).

Option:

- 12 The Emergency Vehicle (W11-8) sign, or a word message sign indicating the type of emergency vehicle (such as rescue squad), may be used in advance of the emergency-vehicle station when no emergency-vehicle traffic control signal is present.
- 13 A Warning Beacon (see Section 4L.03) may be used with any Vehicular Traffic Warning sign to indicate specific periods when the condition or activity is present or is likely to be present, or to provide enhanced sign conspicuity.
- 14 A supplemental WHEN FLASHING (W16-13P) plaque (see Figure 2C-12) may be used with any Vehicular Traffic Warning sign that is supplemented with a Warning Beacon to indicate specific periods when the condition or activity is present or is likely to be present.

Section 2C.50 Non-Vehicular Warning Signs (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22)

Option:

- 01 Non-Vehicular Warning (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22) signs (see Figure 2C-11) may be used to alert road users in advance of locations where unexpected entries into the roadway might occur or where shared use of the roadway by pedestrians, animals, or equestrians might occur.

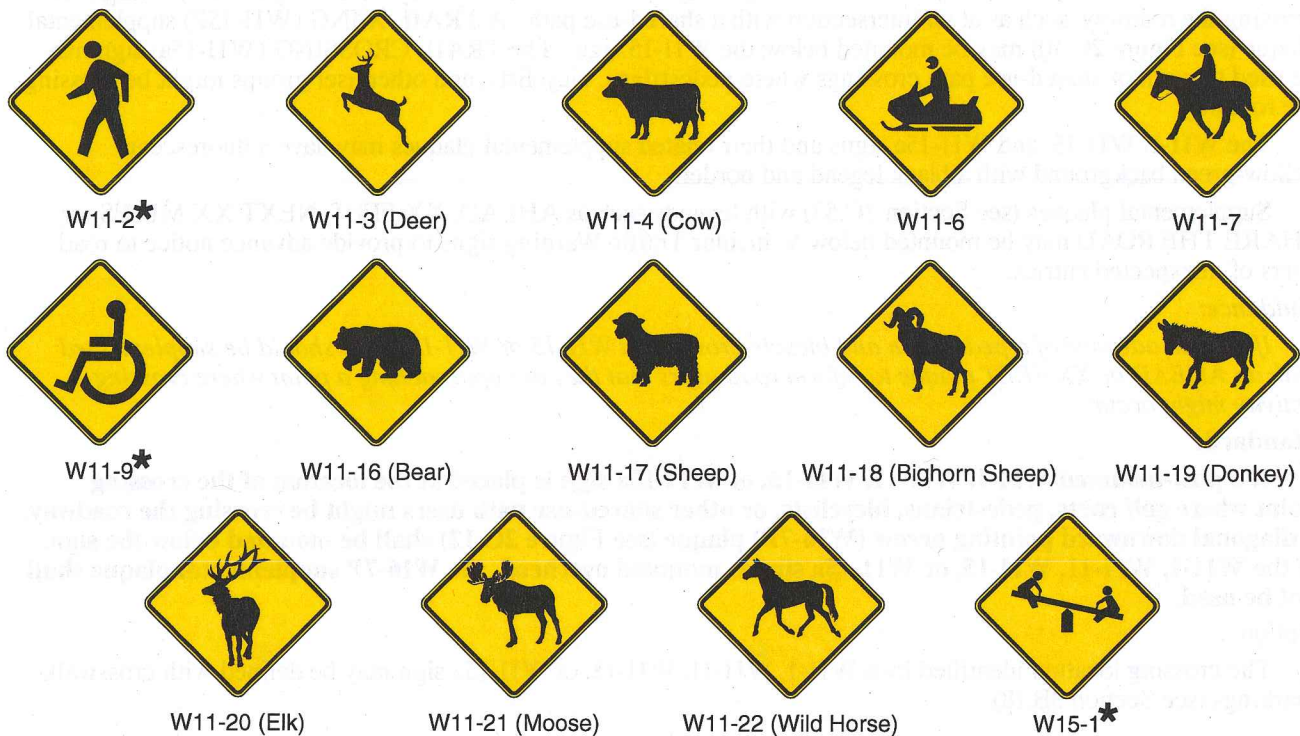
Support:

- 02 These conflicts might be relatively confined, or might occur randomly over a segment of roadway.

Guidance:

- 03 If used in advance of a pedestrian, snowmobile, or equestrian crossing, the W11-2, W11-6, W11-7, and W11-9 signs should be supplemented with plaques (see Section 2C.55) with the legend AHEAD or XX FEET to inform road users that they are approaching a point where crossing activity might occur.

Figure 2C-11. Non-Vehicular Warning Signs



* A fluorescent yellow-green background color may be used for this sign or plaque.



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Item #: E5114
Sign Reads: Caution Watch For Truck Traffic
Sign Type: Surface Mount Signs and Labels. Apply labels to clean and dry surfaces.
Packaging: Sold individually
Holes: Plastic and Aluminum are supplied with 4 pre-drilled mounting holes, Vinyl labels do not have holes.
Availability: In Stock

Accessories & More Information

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Adhesive Backed & Rigid Signs		1	3	5	10	20	40		
10 x 7"	Label: Outdoor Durable Vinyl (Adhesive Backed)	\$5.80	\$5.70	\$5.20	\$4.70	\$3.80	\$3.20	<input type="text"/>	Add To Cart
10 x 7"	.055 Outdoor Durable Plastic	\$6.70	\$6.50	\$6.30	\$6.10	\$5.70	\$4.40	<input type="text"/>	Add To Cart
10 x 7"	.040 Coated Rust Free Aluminum	\$10.70	\$10.40	\$9.85	\$9.40	\$7.60	\$6.70	<input type="text"/>	Add To Cart
14 x 10"	Label: Outdoor Durable Vinyl (Adhesive Backed)	\$9.70	\$8.40	\$8.20	\$7.50	\$6.50	\$5.60	<input type="text"/>	Add To Cart
14 x 10"	.055 Outdoor Durable Plastic	\$9.85	\$9.40	\$8.90	\$7.95	\$6.90	\$5.75	<input type="text"/>	Add To Cart
14 x 10"	.040 Coated Rust Free Aluminum	\$17.35	\$15.95	\$13.50	\$12.95	\$12.45	\$10.45	<input type="text"/>	Add To Cart
18 x 12"	.125 Outdoor Durable Plastic	\$17.95	\$16.00	\$15.50	\$14.75	\$13.95	\$12.95	<input type="text"/>	Add To Cart
18 x 12"	.063 Coated Rust Free Aluminum	\$18.80	\$17.80	\$17.50	\$16.95	\$14.95	\$13.95	<input type="text"/>	Add To Cart
24 x 18"	.125 Outdoor Durable Plastic	\$27.50	\$26.50	\$25.50	\$24.50	\$23.25	\$22.75	<input type="text"/>	Add To Cart
24 x 18"	.080 Coated Rust Free Aluminum	\$29.75	\$28.40	\$27.90	\$27.40	\$26.90	\$25.75	<input type="text"/>	Add To Cart

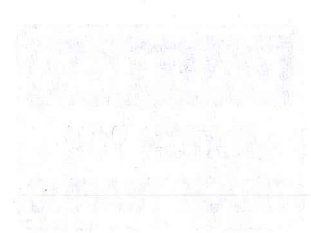
Accessories**Material Descriptions
& Sign Application****Heavy Duty Nylon Ties - NT8 Heavy Duty Nylon Ties**

Size	Materials	Price	Enter Quantity
Safety Sign - Fence Mounting Accessory		1	
8" Long	White Nylon Ties - Package of 100	\$15.00	<input type="text"/> Add To Cart

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Size	Materials	Price	Enter Quantity
Fence Bracket for Traffic/Parking Signs (for 3/8" dia. Holes) 2 holes		1 6 11	
5/16" x 1"	Fence Bracket with 1-Way Bolt for Traffic/Parking Signs (Includes 2 brackets, 2 nuts, 2 One way bolts 5/16" x 1")	\$12.00 \$10.80 \$9.75	<input type="text"/> Add To Cart

MEMORANDUM FOR THE RECORD
SUBJECT: [Illegible]
[Illegible text block]



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GRDE15-0166 – Raging River Quarry

March 2016 Traffic Impact Analysis (TIA) and project comments

KCDOT Traffic Engineering – Contact Info (206) 477-3652

Project Description: The site is located at approximately 6300 Preston-Fall City Road SE, on the west side of Preston-Fall City Road SE. The proposal is to permit the additional Mining (M) zoned acreage so it is available once the current permitted mining area (allowed under grading permit L73G1592) is exhausted. As mentioned previously, the quarry is currently permitted; however, it has not been operational for approximately 12 years.

An EIS was prepared with an addendum in 1987 that identified between 50-60 truckloads (100-120 trips) per day from the quarry as the traffic impact. It is anticipated that approximately 400,000 tons per year would be removed based on this number of trips. In order to be conservative and hit the threshold of 30 AM and PM peak hour trips, 650,000 tons per year was analyzed. An updated traffic impact analysis (TIA) was completed in August of 2015 by Gibson Traffic Consultants to examine the current and future traffic conditions of the surrounding area and identify any potential impacts of the quarry operating again. The horizon year used for the project is 2021.

The quarry is not proposing to increase the 50-60 truckloads per day as identified in the EIS addendum; the proposed re-opening and site expansion will only increase the length of time that the quarry can be operational. Access to and from the site will continue to be from Preston Fall City Road SE via SE Carmichael Road.

King County Department of Transportation (KCDOT), Engineering Services Section, Traffic Engineering Unit has reviewed the TIA prepared by Gibson Traffic Consultants, the King County assessor maps, King County iMap, Google and Bing maps and the additional information provided and we have the following comments:

1. Clarify when the quarry is expected to begin operations.
2. From a KCDOT Traffic Engineering standpoint, the TIA provides all necessary information regarding trip generation, trip distribution, traffic volumes, and level of service.
3. Per the TIA, the project will generate 198 daily truck trips. The project will generate 30 AM and PM peak hour trips. Hours of operation will be from 7:30 AM to 4:00 PM and trucks will haul approximately 260 days per year. From a level of service (LOS) standpoint, the intersection of Preston Fall City Road SE and SE Carmichael Road will operate at LOS B in both the AM and PM peak hour period.
4. Per the TIA, there are no King County intersections that meet the K.C.C. 14.80, "Intersection Standards" thresholds of 30-peak hour and 20% of the peak hour trips and operating at a level of service worse than "E". Therefore, the project will not result in any significant adverse traffic impacts and there will be no off-site mitigation required for this project.

5. KCDOT Traffic Engineering concurs with the TIA that right and left turn lane warrants are not met at the intersection of Preston Fall City Road SE and SE Carmichael Road per the Washington State Department of Transportation (WSDOT) Design Manual guidelines.
6. KCDOT Traffic Engineering concurs with the TIA that there is adequate stopping sight distance (SSD) and entering sight distance (ESD) to the south for the existing site access intersection of Preston Fall City Road SE and SE Carmichael Road per the 2007 King County Road Design and Construction Standards (KCRDCS).
7. The posted speed limit for Preston Fall City Road SE is 45 mph. This implies a design speed of 55 mph. Per the KCRDCS, the required SSD is 495 feet and the required ESD is 610 feet based on a 55 mph design speed. The sight distance analysis on page 6 of the TIA states that for vehicles approaching to and from the north there is greater than 500 feet of ESD and SSD. For vehicles approaching to and from the south there is greater than 700 feet of ESD and SSD.

Exact measurements need to be made to determine the actual ESD to the north along Preston Fall City Road SE. If the 610 foot ESD minimum per the KCRDCS is not met, the applicant needs to propose how the standard can be met. Examples of possible solutions might be clearing and grading within the right-of-way, re-locating the site access, using only the southern portion of the SE Carmichael Road intersection with Preston Fall City Road SE (SE Carmichael Road intersects Preston Fall City Road SE north and south of an existing utility pole) or conducting a speed study to ascertain if the 85th percentile speed is less than the design speed of 55 mph. Other solutions can be proposed by the applicant.

8. KCDOT Traffic Engineering, Traffic Operations staff has installed 2 W11-6 (Truck Crossing Symbol) warning signs north and south of SE Carmichael Road and Preston Fall City Road SE intersection.
9. KCDOT Traffic Engineering recommends that a certified flagger be used for directing traffic in and out of the Raging River Quarry at the intersection of SE Carmichael Road and Preston Fall City Road SE. This is a viable solution to the issue raised in comment #7 above.

GRDE 15-0160

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GTC

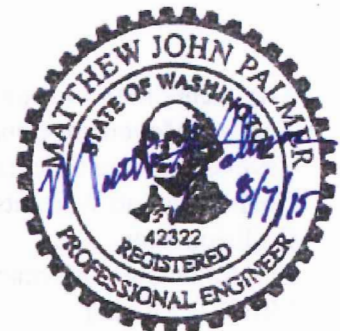
Gibson Traffic Consultants
2802 Wetmore Avenue
Suite 220
Everett, WA 98201
425.339.8266

Raging River Quarry Traffic Impact Analysis

Jurisdiction: King County

August 2015

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GTC #15-137

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1. INTRODUCTION

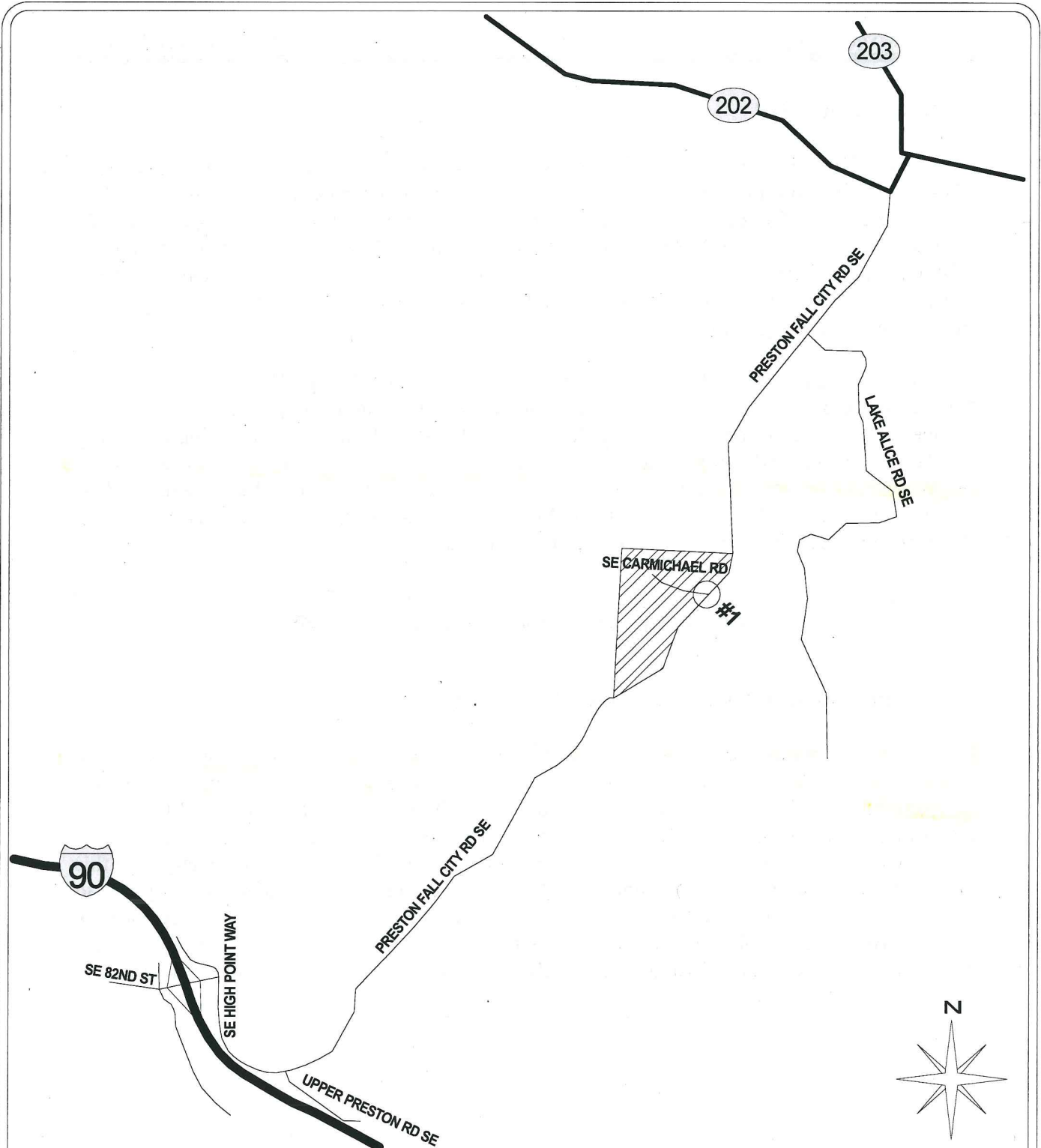
Gibson Traffic Consultants, Inc. (GTC) has been retained to complete a Traffic Impact Analysis (TIA) for the proposed Raging River Quarry mineral extraction site per King County Level One TIA requirements. The quarry is currently permitted; however, it has not been operational for approximately 12 years. An EIS was prepared with an addendum in 1987 that identified between 50-60 truckloads per day from the quarry as the transportation impact. This addendum/TIA is intended to examine the current traffic conditions of the area and identify the potential impacts of the quarry operating again.

The site is located along the west side of Preston Fall City Road SE, at the terminus of Carmichael Road, in King County. The Raging River Quarry is not proposing to increase the number of loads identified in the EIS addendum. With 50-60 loaded trucks leaving the quarry per day it is anticipated that approximately 400,000 tons of material could be removed annually with this number of trucks. Although this annual tonnage is not anticipated to be exceeded; in order to hit the threshold for analysis of 30 AM and PM peak-hour trips, GTC calculated to reach that many trips 650,000 tons/year would need to be reached.

This report summarizes GTC's traffic analysis of this overly conservative annual tonnage and findings that include: collision data, sight distance, channelization warrants, and level of service.

2. PROPOSED SITE DEVELOPMENT & ACCESS

The proposed Raging River Quarry mineral extraction site expansion will not increase the amount of material removed from the site, instead it will just increase the length of time the pit is operational. The site will continue to be located along the west side of Preston Fall City Road SE, at the terminus of Carmichael Road. A site vicinity map is included in Figure 1. The existing access will continue to be utilized. The future year of 2021 has been used for the analysis in this report, which represents a 6-year horizon period for the site. As the traffic is likely not to increase over previously approved levels and the analysis in this report represent a conservatively high number of trips; as long as the tonnage does not exceed 650,000 tons/year the pit should be allowed to operate from a traffic perspective until the site is fully extracted and reclaimed.



GIBSON TRAFFIC CONSULTANTS

**TRAFFIC IMPACT STUDY
GTC #15-137**

**RAGING RIVER QUARRY
MAX 650,000 TONS/YEAR**

KING COUNTY

LEGEND



DEVELOPMENT SITE



STUDY INTERSECTION

**FIGURE 1
SITE VICINITY MAP**

3. METHODOLOGY & ANALYSIS SCOPING

The only intersection which would be impacted with 30 or more peak-hour trips and 20% of the site traffic is the access point to Preston Fall City Road SE. This is with the conservatively high extraction level of 650,000 tons/year. Without this theoretical increase in annual tonnage no intersections would need to be analyzed under the existing permitted conditions.

The level of service at the study intersections has been determined using the methodology described in the 2010 *Highway Capacity Manual* (HCM). The analysis has been performed utilizing the *Synchro 8*. Trip generation calculations for the quarry are based on information provided by the client and prior GTC experience pertaining to similar earthmoving activities. Warrants for left-turn and right-turn channelization improvements for the intersection of Preston Fall City Road SE at Carmichael Road/Site Access are based on nomographs provided in WSDOT's *Design Manual*.

Traffic congestion on roadways is generally measured in terms of level of service. In accordance with the 2010 *Highway Capacity Manual* (HCM), roadway facilities and intersections are rated between LOS A and F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service at signalized intersections, all-way stop-controlled intersections and roundabouts is based on the average stopped delay for all entering vehicles based on the HCM and WSDOT methodologies. The level of service at two-way stop-controlled intersections is based on the stopped delay for the approach or movement(s) with the highest delay. Geometric characteristics and conflicting traffic movements are taken into consideration when determining the level of service of an intersection. A summary of the level of service criteria has been included in Table 1.

Table 1: Level of Service Criteria for Intersections

Level of ¹ Service	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	Signalized Intersections
A	Little/No Delay	≤10	≤10
B	Short Delays	>10 and ≤15	>10 and ≤20
C	Average Delays	>15 and ≤25	>20 and ≤35
D	Long Delays	>25 and ≤35	>35 and ≤55
E	Very Long Delays	>35 and ≤50	>55 and ≤80
F	Extreme Delays ²	>50	>80

Matthew Palmer, responsible for the traffic analysis and report, is a licensed professional engineer (Civil) in the State of Washington and a current member of the Washington State section of ITE.

4. EXISTING CONDITIONS

4.1 Transit Service

Metro Transit provides public transit service within unincorporated King County. There are currently no transit stops in the site vicinity along Preston Fall City Road.

4.2 Collision Analysis

Collision data was requested from WSDOT from January 2001 to the current available data in 2015 for the section of Preston Fall City Road SE from MP 2.700 to 2.940 (inclusive of Carmichael Road/Site Access). There were a total of 11 collisions over this 15 year time period. This results in a low collision frequency of less than 1 collision per year. None of the collisions involved gravel trucks or pedestrians and non-resulted in fatalities. There were 3 opposite direction collisions, 3 ditch related, 2 rear-end, 1 sign, 1 domestic animal, and 1 not stated.

¹ Source: *Highway Capacity Manual* 2010.

LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).

LOS B: Generally stable traffic flow conditions.

LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.

LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).

LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.

LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

² When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

5. FUTURE CONDITIONS

5.1 Trip Generation

Trip generation calculations for the Raging River Quarry is based on the information provided by the client and prior GTC experience pertaining to similar earthmoving activities. As stated by the client, the amount of material extracted will be likely not exceed the existing permitted 400,000 tons/year; however, to reach King County traffic thresholds for analysis a conservatively high 650,000 tons/year were reached to examine the possible impacts. Each truck and trailer combination can carry approximately 30 tons of material and single tuck can carry approximately 15 tons.

Based on the estimates from other trucking operations it is anticipated that 70% of the trips will be truck and trailer and 30% single trucks. It is also anticipated that the operation would have up to 260 workdays a year; therefore, to move 650,000 tons would require an estimated **198 truck trips in & out per day (99 loads per day)**. The hours of operation for loading trucks are from 7:30 AM to 4:00 PM. It is anticipated that the in/out percentages will reflect that of gravel mines and other heavy truck operations with 15% of the ADT occurring during the AM peak-hour and as a "worst case" 15% during the PM peak-hour.

The Raging River Quarry with the conservative extraction of 650,000 tons/year is anticipated to generate **198 average daily trips (ADT)** with **30 AM peak-hour truck trips (18 inbound/12 outbound)** and **30 PM peak-hour truck trips (12 inbound/18 outbound)**. A trip generation summary has been included in Table 2. The trip generation calculations have been included in the attachments.

The trip generation of the site is summarized in Table 2.

Table 2: Trip Generation Summary

Land Use	Units	Average Daily Trips	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Mineral Extraction	650,000 tons/year	198	18	12	30	12	18	30

5.2 Trip Distribution

Trip distribution for the Raging River Quarry is based the location of other mineral extraction sites and the anticipated market for materials and haul routes to/from these markets. It is estimated that 20% of the site traffic would travel to and from the north on Preston Fall City Road and 80% to and from the south to get to I-90. Detailed trip distributions are shown in Figure 2 and Figure 3 for the AM and PM peak-hours, respectively.

5.3 2021 Future Conditions with Development Level of Service

Existing turning movement counts at the study intersection were conducted by the independent count firm of Idax Data on July 1st, 2015. Data at the study intersection was collected from 6:30 to 8:30 AM and from 2:30 to 4:30 PM to encompass the typical operating hours of the quarry with truck traffic. The existing counts were projected to 2021 baseline volumes by applying a 2% annually compounding growth rate to the intersection.

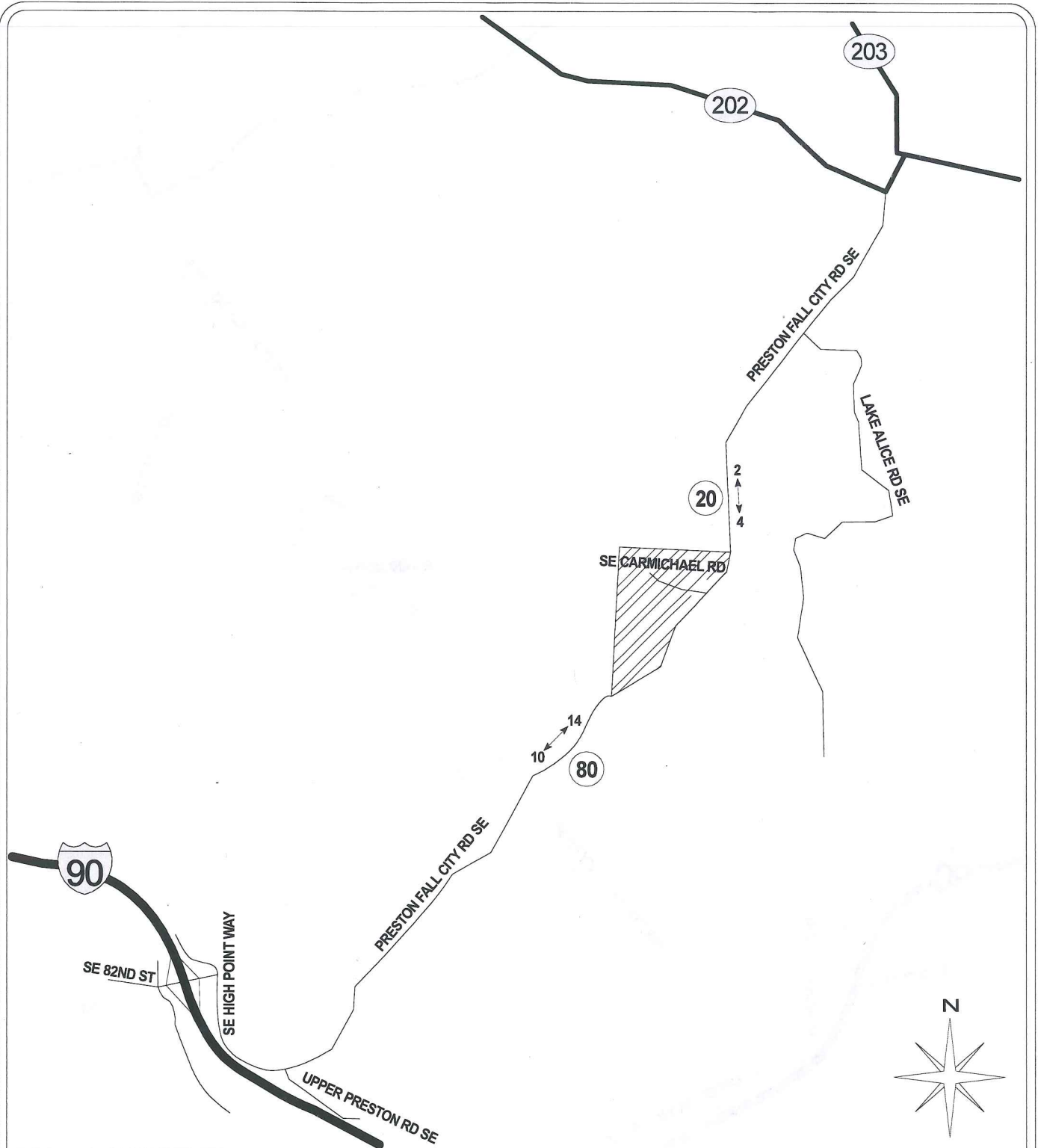
The 2021 future conditions with development turning movement volumes were calculated by adding conservatively high truck trips to the 2021 baseline conditions turning movement volumes. The AM and PM peak-hour turning movement volumes for the existing, baseline and future are shown in Figure 4. The study intersection of Preston Fall City Road SE at Carmichael Road/Site Access will operate at level of service B with 12.9 seconds of delay during the AM peak-hour and level of service B with 13.2 seconds of delay during the PM peak-hour.

5.4 Channelization Improvement Needs

All of the traffic generated by the Raging River Quarry will utilize the intersection of Preston Fall City Road SE at Carmichael Road/Site Access to access the surrounding road network. The 2021 future with development turning movement volumes, as shown in Figure 4, were used to assess if additional channelization is required. Based on WSDOT's channelization standards, Exhibit 1310-7a (Left-turn) and Exhibit 1310-11 (Right-turn) of the *Design Manual*, the southbound left-turn lane and northbound right-turn lane are not warranted based on the future build-out volumes at the intersection. It should also be noted that the intersection of Preston Fall City Road SE at Carmichael Road/Site Access has been analyzed without left or right-turn channelization and the level of service analysis shows that the intersection is anticipated to operate at LOS B during both the AM and PM peak-hours.

5.5 Sight Distance Analysis

GTC conducted field measurements of sight distances at the intersection of Preston Fall City Road SE at Carmichael Road. The posted speed limit in the site vicinity is 45 mph. Based on a 55 mph design speed, posted speed limit plus 10 mph, the required stopping sight distance is 495 feet and the required entering sight distance is 610 feet. For vehicles approaching from the north there is greater than 500 feet of stopping and entering sight distance. For vehicles approaching to and from the south there is greater than 700 feet of available stopping and entering sight distance. Although the safe stopping sight distance is met, GTC would recommend a truck entering sign (W11-10 from the MUTCD) be installed for southbound vehicles.



GIBSON TRAFFIC CONSULTANTS

**TRAFFIC IMPACT STUDY
GTC #15-137**

**RAGING RIVER QUARRY
MAX 650,000 TONS/YEAR**

KING COUNTY

LEGEND

AM \longleftrightarrow PEAK

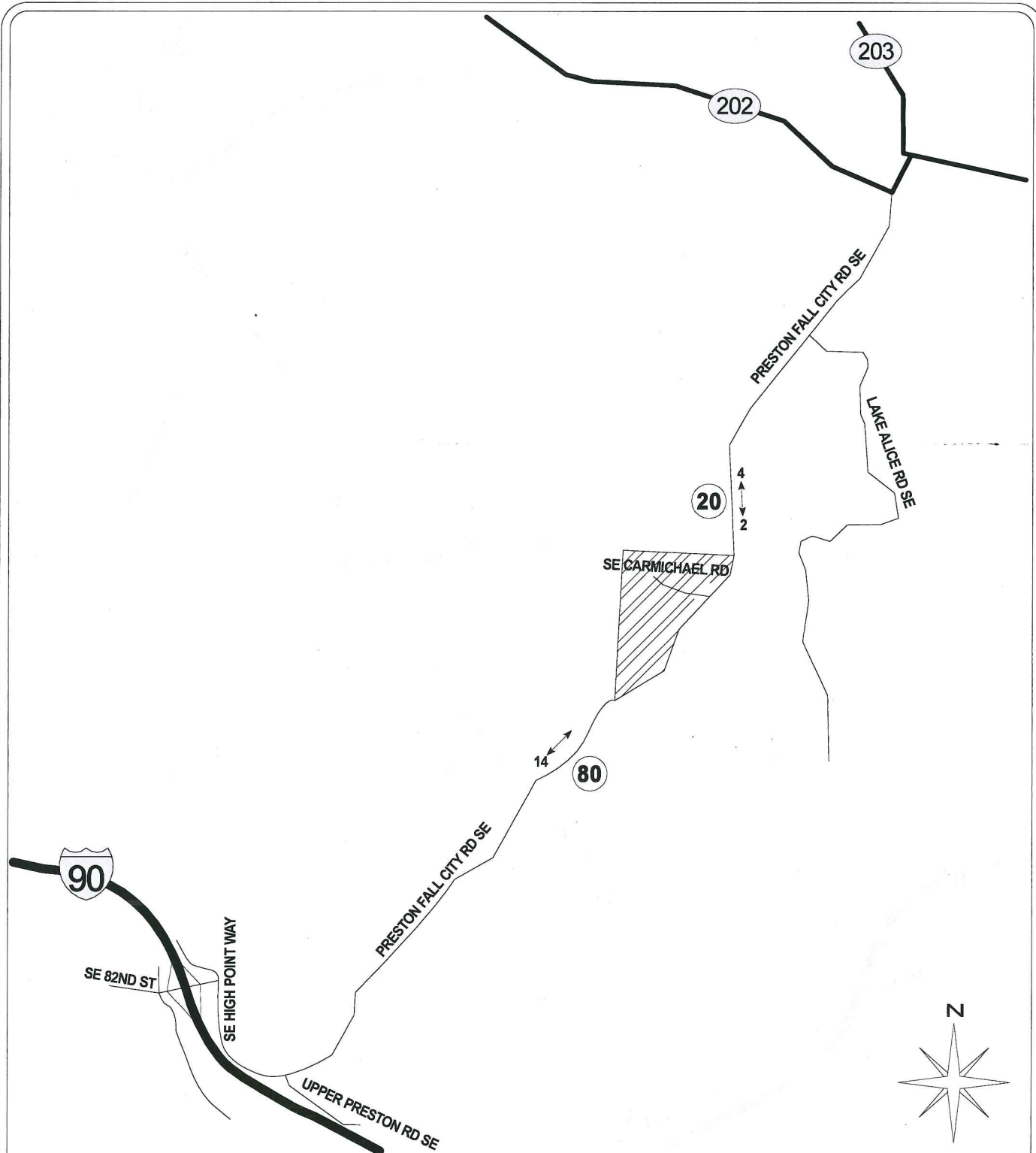


NEW DAILY TRAFFIC
NEW AM PEAK HOUR TRIPS

TRIP DISTRIBUTION %

FIGURE 2

**QUARRY TRIP
DISTRIBUTION
AM PEAK-HOUR**



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #15-137

RAGING RIVER QUARRY
MAX 650,000 TONS/YEAR

LEGEND
 PM ← → PEAK
 NEW DAILY TRAFFIC
 NEW SCHOOL PM PEAK HOUR TRIPS
 (XX) TRIP DISTRIBUTION %

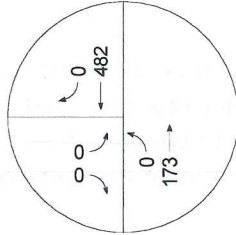
KING COUNTY

FIGURE 3
QUARRY TRIP
DISTRIBUTION
PM PEAK-HOUR

AM TURNING MOVEMENTS

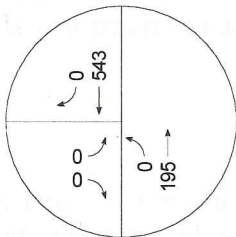
EXISTING TURNING MOVEMENTS

#1 PRESTON FALL CITY ROAD
@ SE CARMICHAEL RD



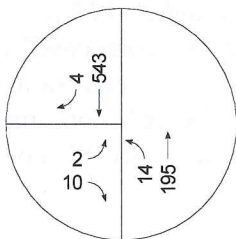
BASELINE TURNING MOVEMENTS

#1 PRESTON FALL CITY ROAD
@ SE CARMICHAEL RD



FUTURE TURNING MOVEMENTS

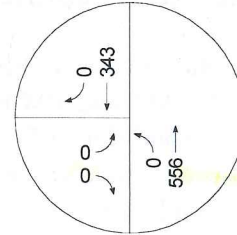
#1 PRESTON FALL CITY ROAD
@ SE CARMICHAEL RD



PM TURNING MOVEMENTS

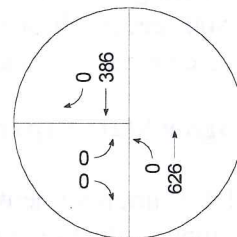
EXISTING TURNING MOVEMENTS

#1 PRESTON FALL CITY ROAD
@ SE CARMICHAEL RD



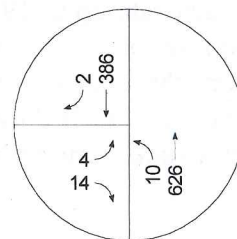
BASELINE TURNING MOVEMENTS

#1 PRESTON FALL CITY ROAD
@ SE CARMICHAEL RD



FUTURE TURNING MOVEMENTS

#1 PRESTON FALL CITY ROAD
@ SE CARMICHAEL RD



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #15-137

RAGING RIVER QUARRY
MAX 650,000 TONS/YEAR

LEGEND

XX → PEAK HOUR
TURNING MOVEMENT VOLUMES

FIGURE 4

AM/PM TURNING
MOVEMENT VOLUMES

KING COUNTY

6. TRAFFIC MITIGATION

6.1 On-Site/Access Improvements

The site access intersections to Preston Fall City Road SE are anticipated to operate at acceptable LOS B during the AM and PM peak-hour without separate channelization for left or right-turn movements. The conditions of Carmichael Road is currently asphalt covered in dirt/gravel, **it is recommended that the roadway be repaved with asphalt** to help eliminate the transport of gravel onto the off-site roadways.

6.2 Off-Site Mitigation/Improvements

The level of service analysis shows that all of the study intersection will continue to operate at an acceptable level of service with the Raging River Quarry. Therefore, off-site intersection improvements should not be required and the Raging River Quarry would be concurrent.

GTC is recommending a truck entering roadway sign (W11-10 from the MUTCD) be installed approximately 500 feet north of the access point to warn southbound drivers that slow moving vehicles could be entering the roadway.

6.3 Washington State Department of Transportation

The latest WSDOT improvement project list available indicates no improvement projects are under planning/fund collection in the site vicinity. Therefore, the development should not be required to pay any HAL/mitigation fees for impacts to WSDOT roadways and intersections.

7. CONCLUSION

The Raging River Quarry development is proposing to expand the existing quarry site to extend the operational life of the quarry. For analysis purposes with an increase in tonnage per year the quarry could to generate up to 198 average daily trips with 30 AM and 30 PM peak-hour trips. The intersection level of service analysis shows that at these projected "worst case" volumes the truck traffic from the quarry will not significantly impact the study intersection and it will operate at acceptable LOS B during the AM and PM peak-hours. The collision analysis shows that there is not a significant collision history along Preston Fall City Road SE corridor in the site vicinity.

Trip Generation Calculations

Raging River Quarry
GTC #15-137

1-YEAR TRIP GENERATION

650,000 tons total in 1 year

650,000 tons/year

tons/truck	30 T & T	70%
tons/truck	15 Single	30%
tons/truck	0 SU	0%
Hours per Day	9	
Days/Week	5	
Weeks/Year	52	
Days/Year	260	

In a Year
650,000 tons
25,490 truck trips

In + Out
per day
198

Total 198

	Total	In	Out
Daily	198	99	99
15% of Daily is AM peak-hour	30	18	12
15% of Daily is PM peak-hour	30	12	18

AM	In	Out
80%	14	10
20%	4	2
PM	In	Out
80%	10	14
20%	2	4

Turning Movement Counts and Calculations

North-South Road: Preston Falls City Road
 East-West Road: Gravel Pit Access
 Counted on: Wednesday, July 1, 2015

PASSENGER VEHICLES							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	31	94	0	0	0	0	125
6:45	29	123	0	0	0	0	152
7:00	21	104	0	0	0	0	125
7:15	35	120	0	0	0	0	155
7:30	43	121	0	0	0	0	164
7:45	40	114	0	0	0	0	154
8:00	35	104	0	0	0	0	139
8:15	39	114	0	0	0	0	153

14:30	62	67	0	0	0	0	129
14:45	79	74	1	0	0	0	154
15:00	106	71	0	0	0	0	177
15:15	97	70	0	0	0	0	167
15:30	144	60	0	0	0	0	204
15:45	118	97	0	0	0	0	215
16:00	131	78	0	0	0	0	209
16:15	145	87	0	0	0	0	232

BUSESSES							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	0	0	0	0	0	0	0
6:45	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0

14:30	0	1	0	0	0	0	1
14:45	0	1	0	0	0	0	1
15:00	1	0	0	0	0	0	1
15:15	0	0	0	0	0	0	0
15:30	2	0	0	0	0	0	2
15:45	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0

TOTAL VEHICLES							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	35	101	0	0	0	0	136
6:45	31	124	0	0	0	0	155
7:00	23	108	0	0	0	0	131
7:15	37	125	0	0	0	0	162
7:30	49	127	0	0	0	0	176
7:45	48	118	0	0	0	0	166
8:00	39	112	0	0	0	0	151
8:15	43	116	0	0	0	0	159

14:30	66	75	0	0	0	0	141
14:45	83	80	1	0	0	0	164
15:00	110	76	0	0	0	0	186
15:15	101	76	0	0	0	0	177
15:30	148	69	0	0	0	0	217
15:45	125	103	0	0	0	0	228
16:00	134	80	0	0	0	0	214
16:15	149	91	0	0	0	0	240

SINGLE DUMP TRUCK							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	0	2	0	0	0	0	2
6:45	1	1	0	0	0	0	2
7:00	1	0	0	0	0	0	1
7:15	1	1	0	0	0	0	2
7:30	2	0	0	0	0	0	2
7:45	1	0	0	0	0	0	1
8:00	1	0	0	0	0	0	1
8:15	0	2	0	0	0	0	2

14:30	1	1	0	0	0	0	2
14:45	1	1	0	0	0	0	2
15:00	1	0	0	0	0	0	1
15:15	1	0	0	0	0	0	1
15:30	1	1	0	0	0	0	2
15:45	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0

SMALL TRUCK (NOT DUMPER)							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	1	0	0	0	0	0	1
6:45	0	0	0	0	0	0	0
7:00	0	1	0	0	0	0	1
7:15	1	1	0	0	0	0	2
7:30	1	1	0	0	0	0	2
7:45	0	0	0	0	0	0	0
8:00	1	3	0	0	0	0	4
8:15	3	0	0	0	0	0	3

14:30	0	1	0	0	0	0	1
14:45	1	2	0	0	0	0	3
15:00	1	2	0	0	0	0	3
15:15	0	5	0	0	0	0	5
15:30	1	1	0	0	0	0	2
15:45	4	3	0	0	0	0	7
16:00	1	1	0	0	0	0	2
16:15	1	2	0	0	0	0	3

PEAK-HOUR TOTALS							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
7:15	37	125	0	0	0	0	162
7:30	49	127	0	0	0	0	176
7:45	48	118	0	0	0	0	166
8:00	39	112	0	0	0	0	151
TOTAL	173	482	0	0	0	0	655

15:30	148	69	0	0	0	0	217
15:45	125	103	0	0	0	0	228
16:00	134	80	0	0	0	0	214
16:15	149	91	0	0	0	0	240
TOTAL	556	343	0	0	0	0	899

TRAILER DUMP TRUCK							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	2	2	0	0	0	0	4
6:45	0	0	0	0	0	0	0
7:00	0	1	0	0	0	0	1
7:15	0	0	0	0	0	0	0
7:30	1	4	0	0	0	0	5
7:45	5	3	0	0	0	0	8
8:00	1	1	0	0	0	0	2
8:15	1	0	0	0	0	0	1

14:30	0	3	0	0	0	0	3
14:45	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0
15:15	3	0	0	0	0	0	3
15:30	0	3	0	0	0	0	3
15:45	1	2	0	0	0	0	3
16:00	1	0	0	0	0	0	1
16:15	1	1	0	0	0	0	2

TRAILER TRUCK (NOT DUMPER)							
START	NB THRU	SB THRU	NB LEFT	SB RIGHT	EB LEFT	EB RIGHT	TOTAL
6:30	1	3	0	0	0	0	4
6:45	1	0	0	0	0	0	1
7:00	1	2	0	0	0	0	3
7:15	0	3	0	0	0	0	3
7:30	2	1	0	0	0	0	3
7:45	2	1	0	0	0	0	3
8:00	1	4	0	0	0	0	5
8:15	0	0	0	0	0	0	0

14:30	3	2	0	0	0	0	5
14:45	2	2	0	0	0	0	4
15:00	1	3	0	0	0	0	4
15:15	0	1	0	0	0	0	1
15:30	0	4	0	0	0	0	4
15:45	2	1	0	0	0	0	3
16:00	1	1	0	0	0	0	2
16:15	2	1	0	0	0	0	3

HEAVY
7
12
12
12

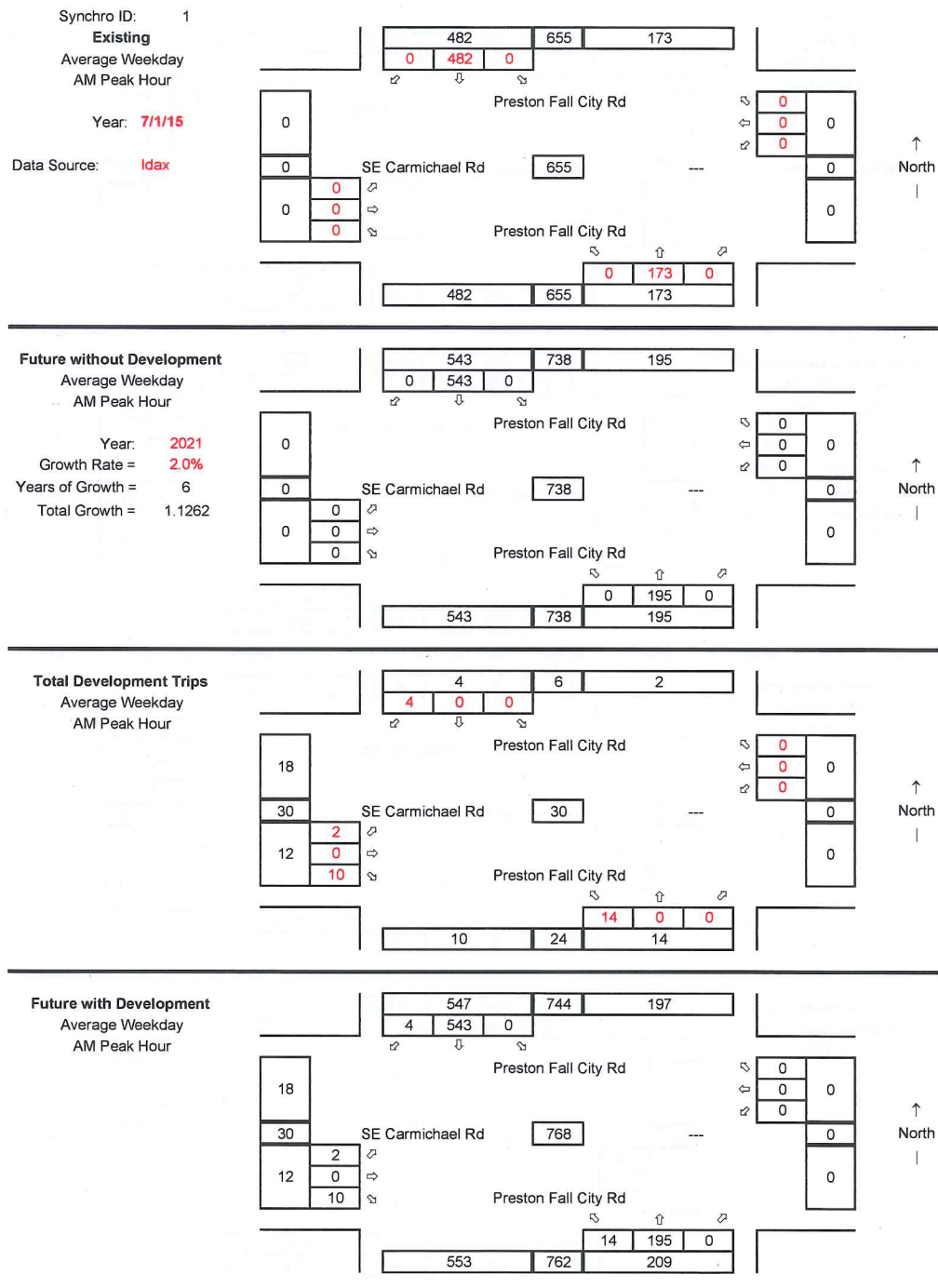
43 6.6% of Total

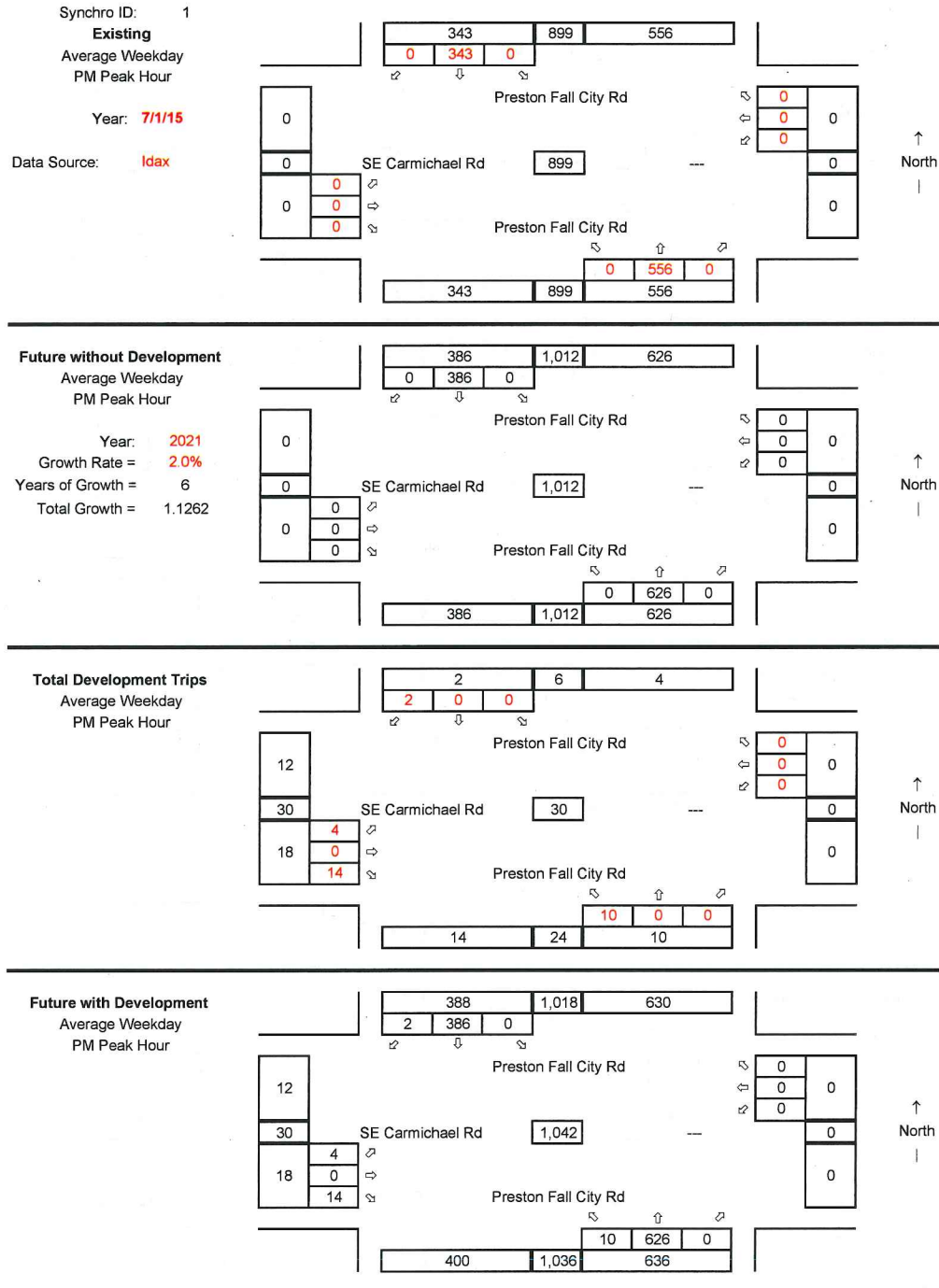
Peak-Hour Factor
0.93

13
13
5
8

39 4.3% of Total

Peak-Hour Factor
0.94





Level of Service Calculations

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	2	10	14	195	543	4
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	94	94	94	94	94	94
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	2	11	15	207	578	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	817	580	582	0	-	0
Stage 1	580	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	343	510	982	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	337	510	982	-	-	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	784	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	12.9		0.6		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	982	-	470	-	-
HCM Lane V/C Ratio	0.015	-	0.027	-	-
HCM Control Delay (s)	8.7	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	4	14	10	626	386	2
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	94	94	94	94	94	94
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	4	15	11	666	411	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1099	412	413	0	-	0
Stage 1	412	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Critical Hdwy	6.44	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	233	636	1135	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	230	636	1135	-	-	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	489	-	-	-	-	-

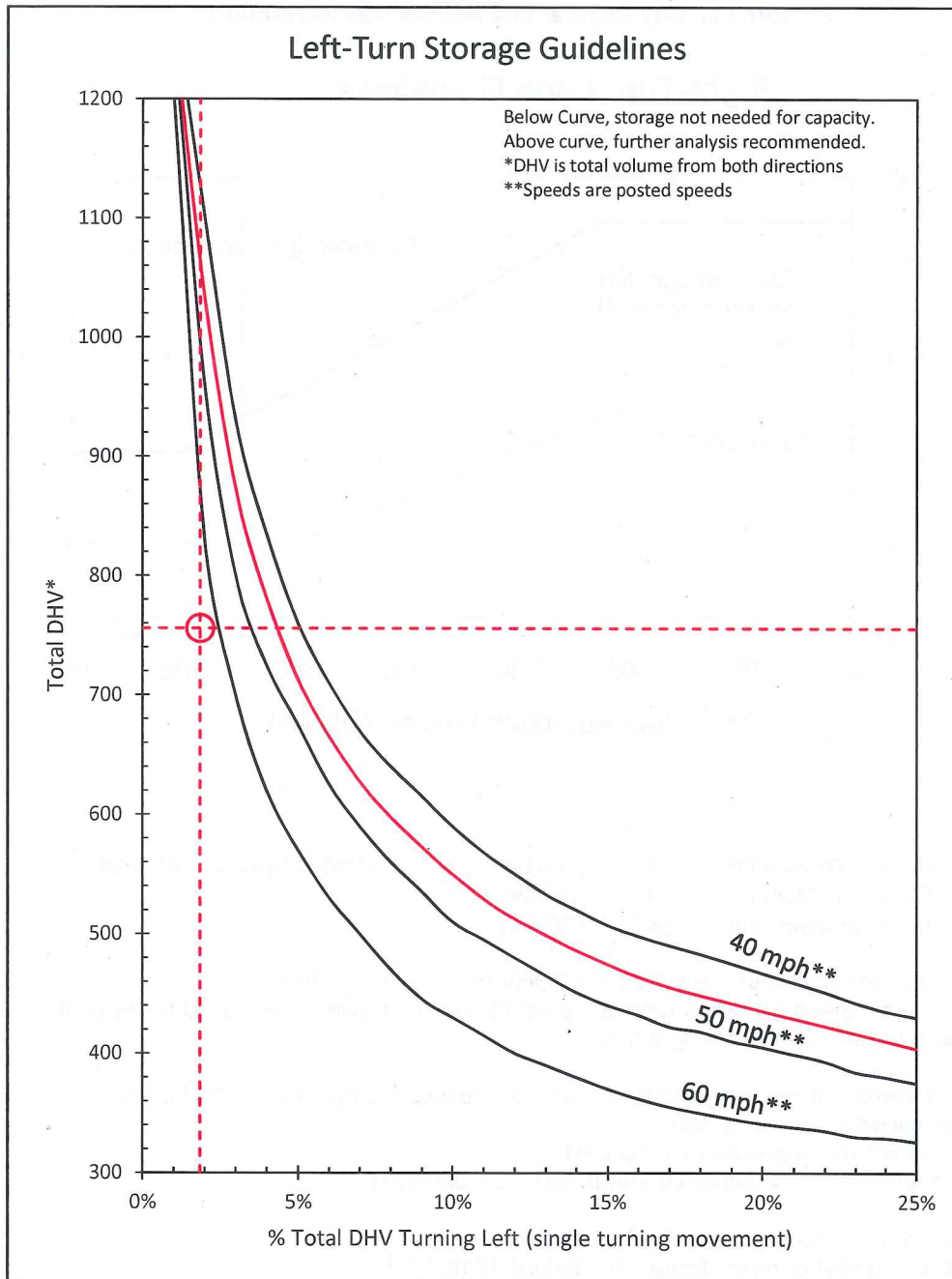
Approach	EB		NB		SB
HCM Control Delay, s	13.2		0.1		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1135	-	457	-	-
HCM Lane V/C Ratio	0.009	-	0.042	-	-
HCM Control Delay (s)	8.2	0	13.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Channelization Warrants

GIBSON TRAFFIC CONSULTANTS

Preston Fall City Road at Site Access (AM Peak-hour)



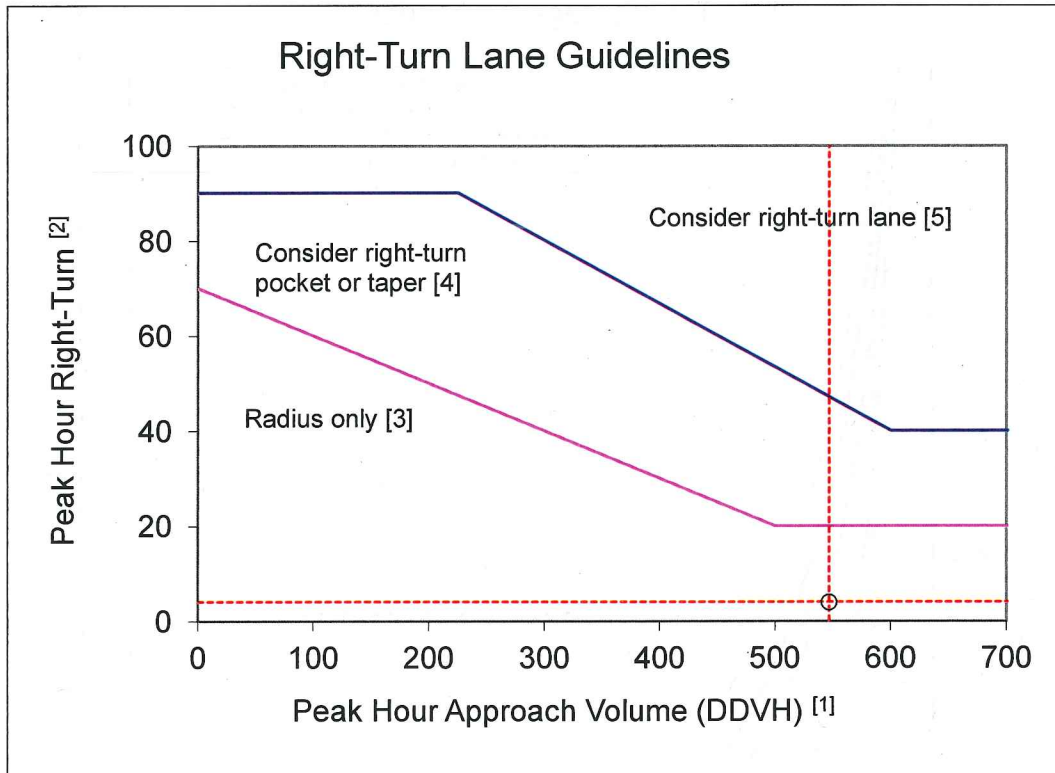
Total DHV: 756
Left Turns: 14
% Left: 1.9%

Posted Speed: 45 mph

Based on WSDOT July 2013 Design Manual: Exhibit 1310-7a, Page 1310-14.

GIBSON TRAFFIC CONSULTANTS

Preston Fall City Road at Site Access (AM Peak-hour)



Right Turn Volume: 4 [DDHV]
Adjusted Right Turn Volume: 4 [DDHV]
Pk Hr Curb Ln Approach Vol: 547 [DDHV]

Posted Speed: 45 mph

[1] For two-lane highways, use the peak hour DDHV (through + right turn).
For multilane, high speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right turn).

[2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:

- The posted speed is 45 mph or less
- The right-turn volume is greater than 40 VPH
- The peak hour approach volume (DDHV) is less than 300 VPH.

[3] For right-turn corner design, see Exhibit 1310-6.

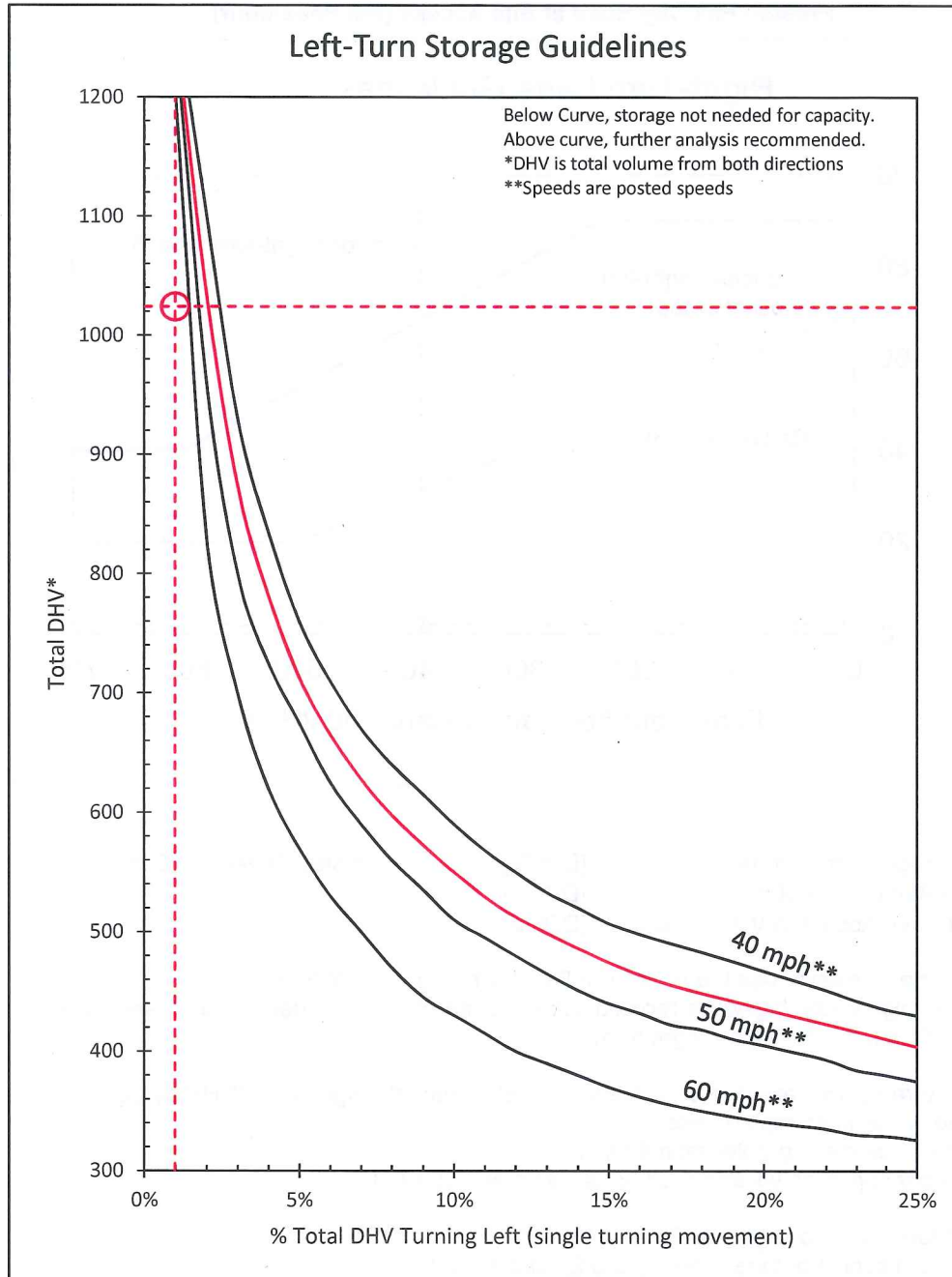
[4] For right-turn pocket or taper design, see Exhibit 1310-12.

[5] For right-turn lane design, see Exhibit 1310-13.

Based on WSDOT July 2013 Design Manual: Exhibit 1310-11, Page 1310-27.

GIBSON TRAFFIC CONSULTANTS

Preston Fall City Road at Site Access (PM Peak-hour)



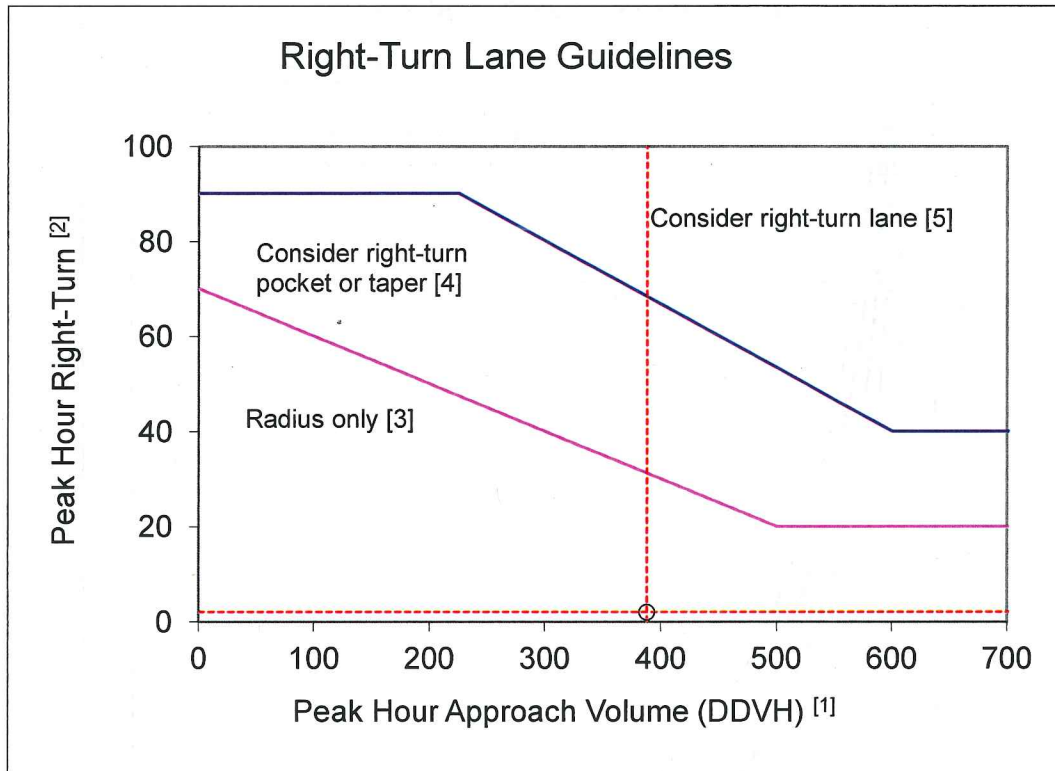
Total DHV: 1,024
Left Turns: 10
% Left: 1.0%

Posted Speed: 45 mph

Based on WSDOT July 2013 Design Manual: Exhibit 1310-7a, Page 1310-14.

GIBSON TRAFFIC CONSULTANTS

Preston Fall City Road at Site Access (PM Peak-hour)



Right Turn Volume: 2 [DDHV]
Adjusted Right Turn Volume: 2 [DDHV]
Pk Hr Curb Ln Approach Vol: 388 [DDHV]

Posted Speed: 45 mph

[1] For two-lane highways, use the peak hour DDHV (through + right turn).
For multilane, high speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right turn).

[2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:

- The posted speed is 45 mph or less
- The right-turn volume is greater than 40 VPH
- The peak hour approach volume (DDHV) is less than 300 VPH.

[3] For right-turn corner design, see Exhibit 1310-6.

[4] For right-turn pocket or taper design, see Exhibit 1310-12.

[5] For right-turn lane design, see Exhibit 1310-13.

Based on WSDOT July 2013 Design Manual: Exhibit 1310-11, Page 1310-27.

Collision Data



Washington State
Department of Transportation
Lynn Peterson
Secretary of Transportation

Transportation Data and GIS Office
7345 Linderson Way Sw, Fl 1
Tumwater, WA 98501

360-570-2464 / Fax 360-570-2449
TTY: 1-800-833-6388
www.wsdot.wa.gov

July 2, 2015

Matthew Palmer
Gibson Traffic Consultants
2802 Wetmore Ave #220
Everett WA 98201

Dear Mr. Palmer:

In accordance with the Public Records Act, RCW 42.56, this letter acknowledges receipt of your request for records dated June 29, 2015 (Request Number PDR-15-1871).

We have prepared a history of officer reported crashes that occurred *at or within 1/10 mile of* the following intersection in King County for the period of 1/1/2001 – available 2015 (*2015 data is partial and preliminary*).

- Preston Fall City Rd (Co Rd #98906, mp 2.700 – 2.940) @ Carmichael Rd (Private Rd)

Federal law 23 United States Code Section 409 governs use of the data you requested. Under this law, data maintained for purposes of evaluating potential highway safety enhancements:

“ . . . shall not be subject to discovery or admitted into evidence in a federal or state court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.” [Emphasis added.]

The Washington State Department of Transportation (WSDOT) is releasing this data to you with the understanding that you will not use this data contrary to the restrictions in Section 409, which means you will not use this data in discovery or as evidence at trial in any action for damages against the WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data. If you should attempt to use this data in an action for damages against WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data, these entities expressly reserve the right, under Section 409, to object to the use of the data, including any opinions drawn from the data.

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With this package, your request for records is complete and closed.

If you have any further questions you may contact me at 360-570-2464.

Sincerely,



Julie Brown

Transportation Planning Technician 3

Transportation Data and GIS Office

OFFICER REPORTED CRASHES THAT OCCURRED *at OR within 1/10 mile of* THE FOLLOWING INTERSECTION IN KING COUNTY

PRESTON FALL CITY RD (CO RD #98906, MP 2.700 - 2.940) @ CARMICHAEL RD (PRIVATE RD)

1/1/2001 - available 2015 (2015 data is partial and preliminary)

UNDER 23 UNITED STATES CODE – SECTION 409, THIS DATA CANNOT BE USED IN DISCOVERY OR AS EVIDENCE

AT TRIAL IN ANY ACTION FOR DAMAGES AGAINST THE WSDOT, OR ANY JURISDICTIONS INVOLVED IN THE DATA

JURISDICTION	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILE POST	A / B	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I N J	# F A T	# V E H	# P E D	# P E D
County Road	98906							2.700		2548977	10/13/2006	15:31	No Injury	0	0	2	0	0
County Road	98906							2.705		E263227	8/11/2013	16:16	Possible Injury	1	0	2	0	0
County Road	98906							2.718		1244775	1/6/2005	9:00	Possible Injury	2	0	2	0	0
County Road	98906							2.801		1397169	4/27/2003	21:56	No Injury	0	0	1	0	0
County Road	98906							2.820		1397518	5/6/2003	6:08	No Injury	0	0	1	0	0
County Road	98906							2.849		1145125	2/4/2003	0:35	Unknown	0	0	1	0	0
County Road	98906							2.910		2550819	12/30/2007	19:06	No Injury	0	0	2	0	0
County Road	98906							2.911		E426705	5/14/2015	23:27	No Injury	0	0	2	0	0
County Road	98906							2.915		1562030	5/5/2005	12:15	No Injury	0	0	1	0	0
County Road	98906							2.934		3497776	1/29/2013	12:50	No Injury	0	0	1	0	0
County Road	98906							2.940		1856857	3/29/2005	16:45	No Injury	0	0	1	0	0

VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	ROADWAY SURFACE CONDITIONS
Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Driveway Related but Not at Driveway	Dry
Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Driveway Related but Not at Driveway	Dry
Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Not at Intersection and Not Related	Ice
Pickup, Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Dry
Pickup, Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Wet
Pickup, Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Dry
Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Not at Intersection and Not Related	Wet
Not Stated	Pickup, Panel Truck or Vanette under 10,000 lb	Not at Intersection and Not Related	Dry
Pickup, Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Dry
Passenger Car		Not at Intersection and Not Related	Wet
Pickup, Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Snow/Slush

LIGHTING CONDITIONS	FIRST COLLISION TYPE / OBJECT STRUCK	VEH 1 ACTION	VEH 2 ACTION
Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing
Daylight	From opposite direction - both moving - head-on	Going Straight Ahead	Going Straight Ahead
Dark-Street Lights On	Domestic animal (horse, cow, sheep, etc)	Going Straight Ahead	
Dawn	Metal Sign Post	Going Straight Ahead	
Dark-Street Lights On	Not Stated	Going Straight Ahead	
Dark-No Street Lights	From opposite direction - all others	Making U-Turn	Going Straight Ahead
Dark-No Street Lights	From opposite direction - both going straight - sideswipe	Going Straight Ahead	Going Straight Ahead
Daylight	Roadway Ditch	Going Straight Ahead	
Daylight	Roadway Ditch	Going Straight Ahead	
Daylight	Roadway Ditch	Going Straight Ahead	