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Technical Memo

TO:	Angadjot Sandhu Mountview Group LLC
FROM:	Ryan Shea, PTP, Senior Transportation Planner
DATE:	April 24, 2023
PROJECT :	Easton Truck Stop
SUBJECT:	Traffic Impact Analysis Addendum

Introduction:

Mountview Group LLC, plans to construct the *Easton Truck Stop* on West Sparks Road near the I-90 Exit 70 interchange (Lake Easton Road). The project site was previously approved for the construction of the Easton Love's Travel Stop. The proposed *Easton Truck Stop* will be similar in size or smaller than the previously approved project which consisted of a truck stop facility with passenger vehicle and truck fueling, a convenience market and food service, a tire shed for trucks, and overnight truck parking.

A Traffic Impact Analysis (TIA) was submitted and approved for the Easton Love's Travel Stop in 2019. The TIA, which provided an analysis of the existing conditions (2019) and 2020 horizon with and without the project, concluded that no operational deficiencies were expected. Since the proposed *Easton Truck Stop* project is projected to open in 2025, Kittitas County has requested an update to the horizon year analysis.

The 2025 analysis documented in this memo has been prepared based on the data and methods used in the previously approved Love's Travel Stop Traffic Impact Analysis (2019). The TIA is included as **Appendix A.**

Figure 1 illustrates the site vicinity and the transportation network serving the project

Figure 1. Site Vicinity

Future Traffic Volumes

Traffic volume forecasts were prepared for PM peak hour conditions for the 2025 opening year. The future traffic volume forecast includes non-specific background traffic growth and estimated traffic generated by the proposed project.

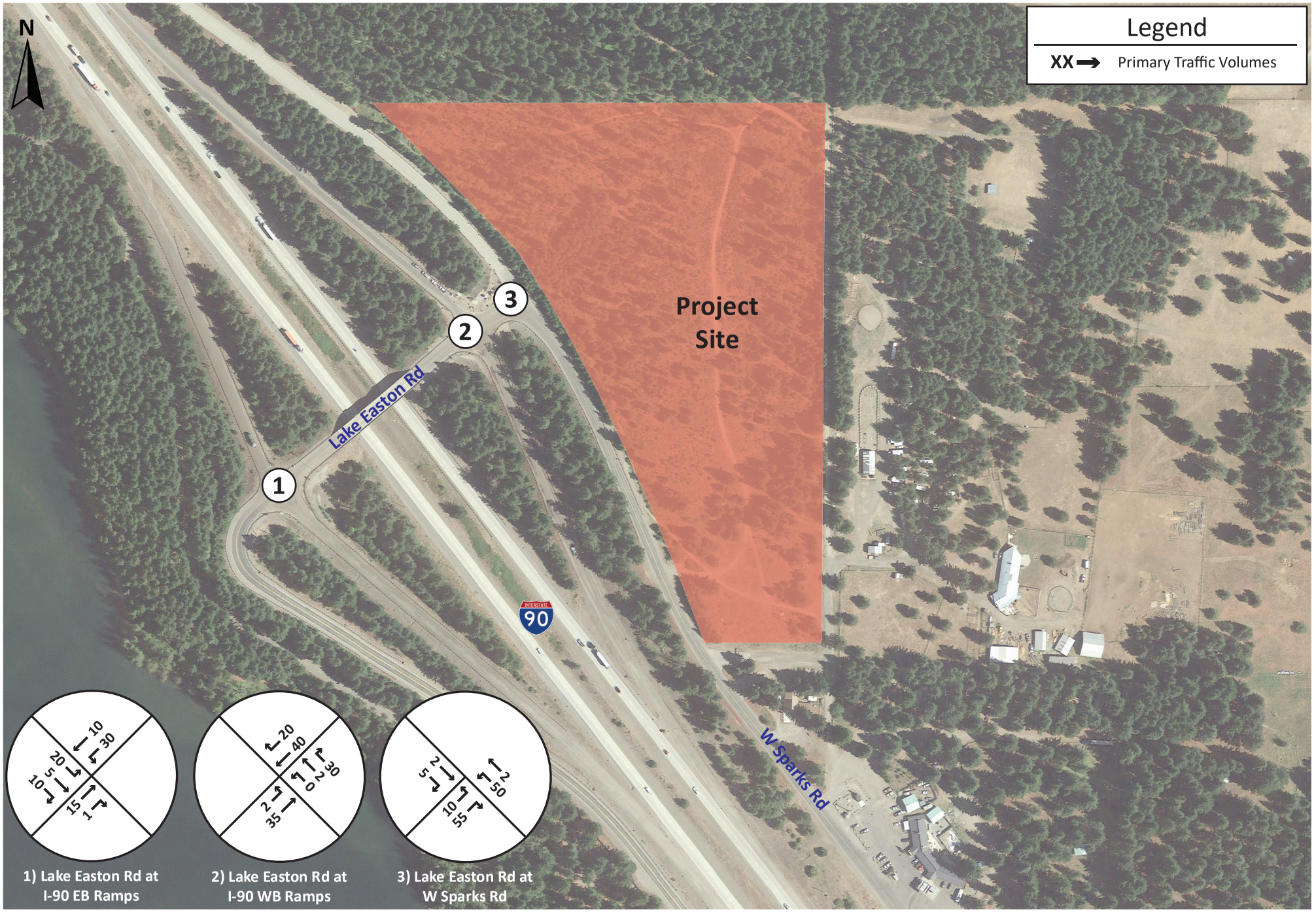
The previous TIA used a 2.0 percent annual growth rate (non-compounded) to calculate the 2020 horizon year. For this updated analysis recent historic counts were reviewed on Sparks Road to determine an appropriate growth rate. Kittitas County provided daily traffic volume counts from September of 2020 and June of 2022. These counts show an annual growth rate of 0.75% on Sparks Road within that timeframe. To provide a conservative analysis, and to be consistent with the previous TIA, a 2.0 percent annual growth rate has been used. This growth rate has been applied to the 2019 turning movement counts collected for the previous TIA. The projected 2025 traffic volumes without the *Easton Truck Stop* are shown on **Figure 2.** The projected 2025 traffic volumes with the project are shown on **Figure 3.**

Traffic Operations Analysis

Traffic analyses were conducted to identify any deficiencies within the study area for the PM peak hour in the 2025 project opening year.

Level of Service

The acknowledged source for determining overall capacity for arterial segments and independent intersections is the current edition of the *Highway Capacity Manual* (HCM) published by the



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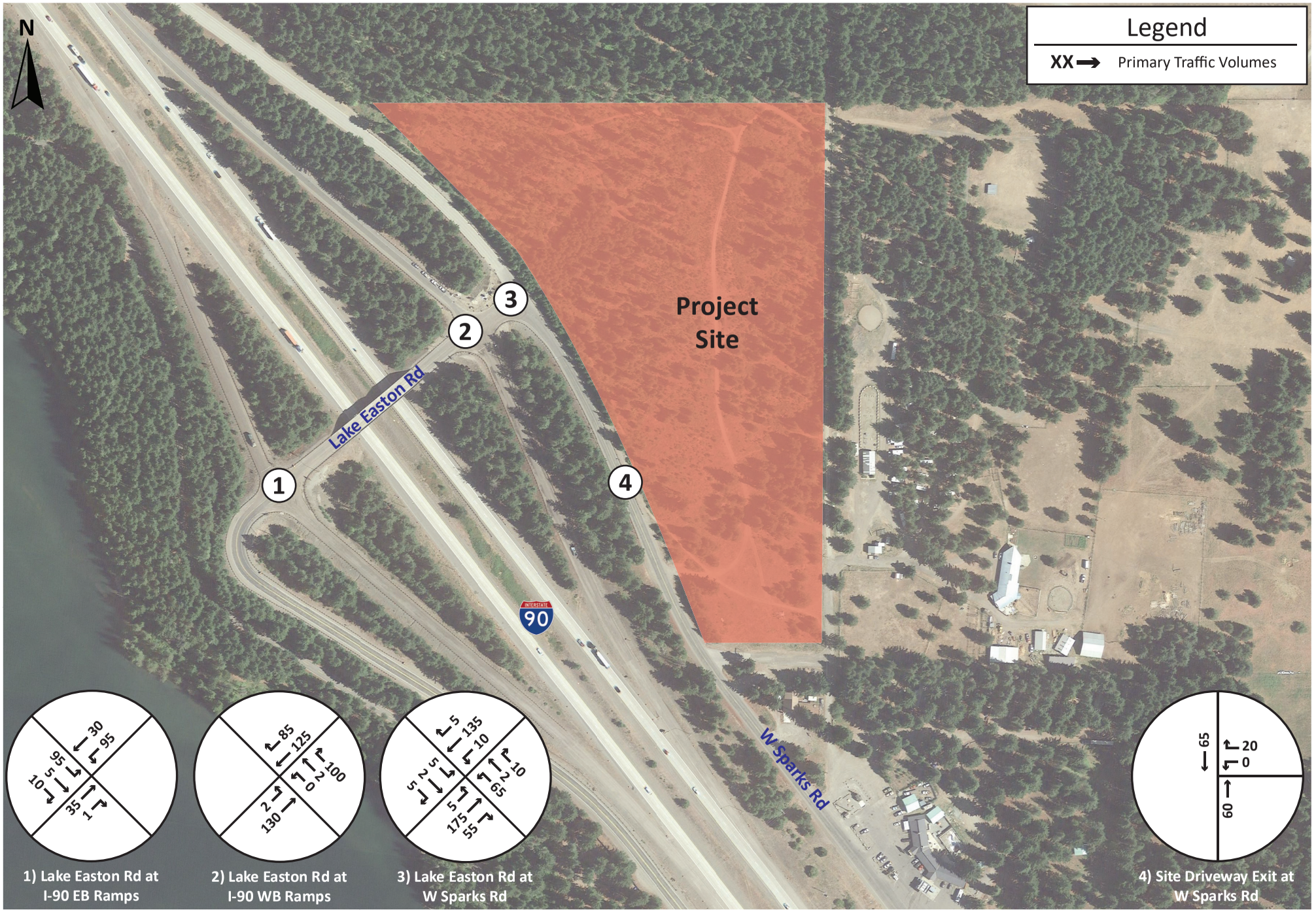
Easton Truck Stop
Traffic Impact Analysis

Figure 2
Projected 2025 PM Peak Hour
Traffic Volumes without Project



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Easton Truck Stop
Traffic Impact Analysis

Figure 3
Projected 2025 PM Peak Hour
Traffic Volumes with Project

Transportation Research Board (TRB). Capacity analyses were completed for the projected 2025 traffic volume scenarios.

Intersection analysis was performed using the Synchro/SimTraffic software package. This software implements the methods of the 6th Edition HCM. Capacity analysis results are described in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a street or highway during a specific time interval. LOS ranges from A (very little delay) to F (long delays and congestion). The software does not provide level of service results for the unusual geometric control conditions present at W Sparks Road/Lake Easton Road. For this location the level of service results were reported from the SimTraffic simulations. For the SimTraffic results the average of five traffic operational simulations was used.

Kittitas County's *Comprehensive Plan* identifies a LOS C standard for rural areas. Transportation improvements would generally be necessary where LOS C operations are exceeded.

Intersection Operations

For intersections under minor street stop-control, the LOS of the most difficult movement (typically the minor street left-turn) represents the intersection Level of Service for purposes of assessing potential impacts. For traffic signals, the intersection average delay is used to assess potential impacts. The following table shows the Level of Service criteria for stop-controlled intersections and signalized intersections.

Table 1. Level of Service Criteria for Intersections

Level of Service	Stop-Controlled Intersection Average Control Delay (seconds/vehicle)
A	≤ 10
B	> 10-15
C	> 15-25
D	> 25-35
E	> 35-50
F	> 50

Intersection Analysis

The analysis was conducted for the following scenarios:

- Projected 2025 background traffic volumes without the *Easton Truck Stop* project
- Projected 2025 traffic volumes with the *Easton Truck Stop* project

I-90 Eastbound Ramps/Lake Easton Road

This intersection operates under stop sign-control for the eastbound off-ramp, with each approach providing a single travel lane.

For the 2025 horizon year without the *Easton Truck Stop* project, the intersection is projected to operate at LOS A with 9.0 seconds of average delay. With the addition of project traffic, the intersection is projected to operate at LOS B in 2025, with 11.9 seconds of average delay.

I-90 Westbound Ramps/Lake Easton Road

This intersection operates under stop sign-control for the eastbound off-ramp, with each approach providing a single travel lane.

For the 2025 horizon without the *Easton Truck Stop* project, the intersection is projected to operate at LOS A with 8.7 seconds of average delay. With the addition of project traffic, the intersection is projected to operate at LOS B, with 10.0 seconds of average delay.

W Sparks Road/Lake Easton Road

This intersection is located approximately 100 feet northeast intersection of Lake Easton Road with the I-90 WB ramps. To best accommodate this tight spacing, the northeast-bound Lake Easton Road approach to this intersection is uncontrolled. Both approaches of W Sparks Road operate under stop-sign control. Each approach provides a single travel lane. With the project this intersection will add a fourth (southwest-bound) approach serving as the north driveway to the site. This fourth approach will also be stop-sign controlled.

Due to the uncommon intersection control, the SimTraffic simulation tool within the Synchro software package was used to calculate the average delay for the stop-controlled movements. For the 2025 horizon without the *Easton Truck Stop* project, the intersection is projected to operate at LOS A with 7.3 seconds of average delay for the southeast-bound approach. With the addition of project traffic and a fourth approach leg, the intersection is projected to operate at LOS A, with 7.9 seconds of average delay for the southeast-bound approach.

Site Driveways

The project is proposed with two access driveways on West Sparks Road. The south driveway will provide passenger vehicle access to the fuel pumps and convenience store. The north driveway will provide access for trucks to the truck parking, fueling and service areas. Both driveway intersections are projected to operate at LOS A for the worst movement.

Right Turn Lane Warrants

Right turn lane warrants were reviewed for each site driveway based on forecasted 2025 PM peak hour traffic volumes, using the right turn lane warrant from the WSDOT design manual (exhibit 1310-11). AS with the original TIA, both driveways are projected to serve less than 20 right-turn vehicles in the peak hour, which is below the minimum amount to meet warrants for a right-turn pocket or taper.

LOS Analysis Summary

The operational analysis results of the study intersections for the PM peak hour are provided in **Table 4**. The LOS analysis worksheets are included in **Appendix B**.

Table 2. PM Peak Hour Intersection Level of Service

Intersection	Control Type	LOS Standard	Projected 2025			
			Without Project		With Project	
			LOS (delay)	Reported Approach	LOS (delay)	Reported Approach
I-90 EB Ramps/Lake Easton Rd	TWSC[1]	C	A (9.0)	EB Off-ramp	B (11.9)	EB Off-ramp
I-90 WB Ramps/Lake Easton Rd	TWSC[1]	C	A (8.7)	WB off-ramp	B (10.0)	WB off-ramp
W Sparks Rd/Lake Easton Rd/North Site Driveway[2]	TWSC[1]	C	A (7.3)	SEB Sparks Road	A (7.9)	SEB Sparks Road
W Sparks Rd/South Site Driveway	TWSC[1]	C	N/A	N/A	A (9.8)	Site Driveway

1. Two-Way Stop-Control
2. Analysis results based on SimTraffic simulations

Summary And Conclusion

Mountview Group LLC, plans to construct the *Easton Truck Stop* on West Sparks Road near the I-90 Exit 70 interchange (Lake Easton Road). The project site was previously approved for the construction of the Easton Love's Travel Stop. The proposed *Easton Truck Stop* will be similar in size or smaller than the previously approved project which consisted of a truck stop facility with passenger vehicle and truck fueling, a convenience market and food service, a tire shed for trucks, and overnight truck parking.

Based on the analysis described in this memo, all the study area intersections are projected to operate at or better than the Kittitas County LOS C standard.

SCJ Alliance

Prepared by Ryan Shea, PTP, Senior Transportation Planner

ERIC S. JOHNSTON
STATE OF WASHINGTON
48180
REGISTERED
PROFESSIONAL ENGINEER

04/24/23

Approved by Eric Johnston, PE, Principal

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Appendix A

2019 Traffic Impact Analysis Report

Traffic Impact Analysis

Love's Travel Stop

Easton Washington
August 2019

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Traffic Impact Analysis

Project Information

Project:	**Love's Travel Stop, Easton**
Prepared for:	**Love's Travel Stops** Patryk Kowalcyzk 10601 North Pennsylvania Oklahoma City, OK 73120

Reviewing Agency

Jurisdiction:	City of Easton

Project Representative

Prepared by:	**SCJ Alliance** 8730 Tallon Lane NE, Suite 200 Lacey, WA 98516 360.352.1465 www.scjalliance.com
Contact:	Brandon Johnson, PE, Civil Engineering Manager Brad Shea, PE, Senior Project Manager George Smith, Senior Transportation Planner
Project Reference:	SC&J# 1398.18 Path: N:\Projects\1398 Love's Travel Center\1398.18 Easton, WA Love's\Traffic\TIA\Report\2019-0826 Easton Love's Travel Stop.docx

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by George Smith, Senior Transportation Planner

8-27-19

Approved by Brad Shea, PE, Senior Project Manager

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1 INTRODUCTION

1.1 Project Overview

Love's Travel Stops & Country Stores plans to construct the Easton *Love's Travel Stop* on West Sparks Road near the I-90 exit 70 interchange in Kittitas County near the community of Easton. The project will consist of a new truck stop facility that will provide passenger vehicle and truck fueling, convenience market and food service, a tire shed for trucks and overnight truck parking.

Figure 1 illustrates the site vicinity and the transportation network serving the project area.

Figure 1. Site Vicinity Map

1.2 Study Context

This report has been prepared to provide the traffic analysis and project information for the City of Easton in reviewing the development proposal. The report describes the existing and forecasted operation of the I-90 exit 70 ramp terminals, Lake Easton Road intersection with W Sparks Road and the projected operation of the site accesses on W Sparks Road. Operational analysis has been prepared for existing 2019 PM peak hour conditions and forecasted 2020 PM peak hour conditions with and without completion of the development.

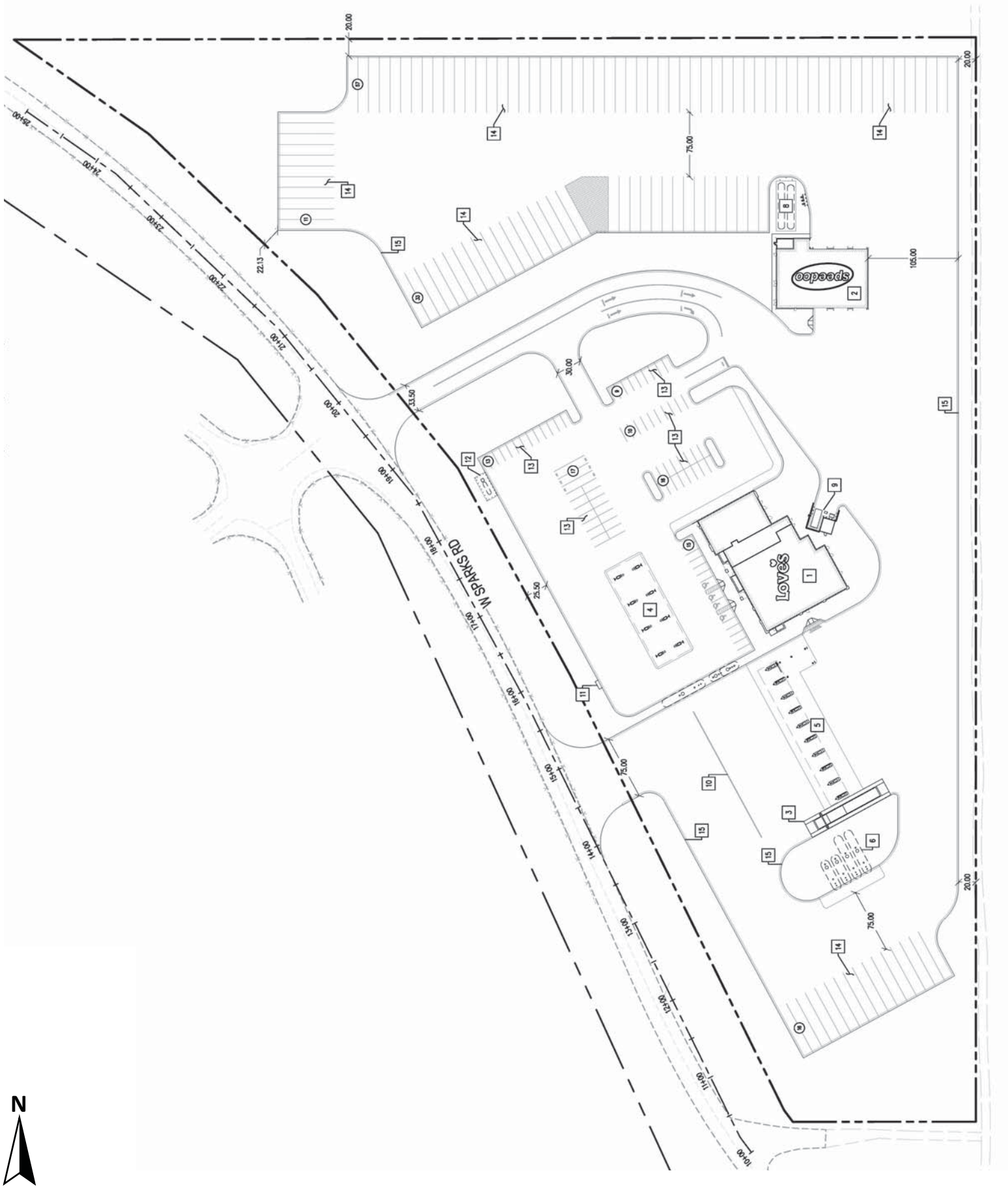
2 PROJECT DESCRIPTION

2.1 Development Proposal

The proposed truck stop project will consist of an approximately 14,500-square foot country store building containing a convenience market with walk-up food service and a drive-through fast-food restaurant. There will be a diesel fueling island with 9 fueling positions and a gasoline island with 16 fueling positions. The project will have a three-bay tire shop for tire replacement and light service for trucks. 117 truck parking stalls for overnight parking, 80 passenger vehicle stalls and 3 RV parking stalls will be provided.

Access to the project will be provided by two driveways on West Sparks Road. The north driveway will complete a new fourth leg at the existing Lake Easton Road/West Sparks Road tee intersection. The South driveway is proposed to be located on West Sparks Road approximately 500 feet south of Lake Easton Road. All traffic is expected to enter via the north driveway. All passenger vehicles are also expected to exit via the north driveway. Trucks exiting the site from the fueling area and south parking area will exit via the south driveway. Trucks leaving from the north parking area will exit via the north driveway. Trucks leaving the fueling area that park in the north parking area will be able to circulate through the site to enter the north parking area.

The preliminary site plan is provided on **Figure 2**.



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Easton Love's Travel Stop
Traffic Impact Analysis

Figure 2
Preliminary Site Plan

3 EXISTING CONDITIONS

3.1 Area Land Uses

The *Love's Travel Stop* will be located off of West Sparks Road near the I-90 exit 70 interchange. The site is currently undeveloped. Adjacent businesses include a Shell gas station and residential properties.

3.2 Roadway Inventory

3.2.1 Interstate-90 (I-90)

Interstate 90 is an east-west freeway that runs from Seattle Washington to Boston Massachusetts. In the project vicinity the roadway has two lanes in each direction with paved shoulders. The posted speed limit is 70 mph.

3.2.2 West Sparks Road

West Sparks Road is classified by Kittitas County as a local roadway through the project vicinity, with a posted speed limit of 35 mph. Within the study area West Sparks Road is a two-lane roadway with no sidewalks and narrow shoulders.

3.2.3 Lake Easton Road/Railroad Street

Lake Easton Road/Railroad Street is classified by Kittitas County as a collector in the project vicinity. It is a two-lane roadway with a posted speed of 35 mph. Within the project vicinity there are no sidewalks provided. Lake Easton Road provides access to I-90 for the properties on Sparks Road as well as the community of Easton.

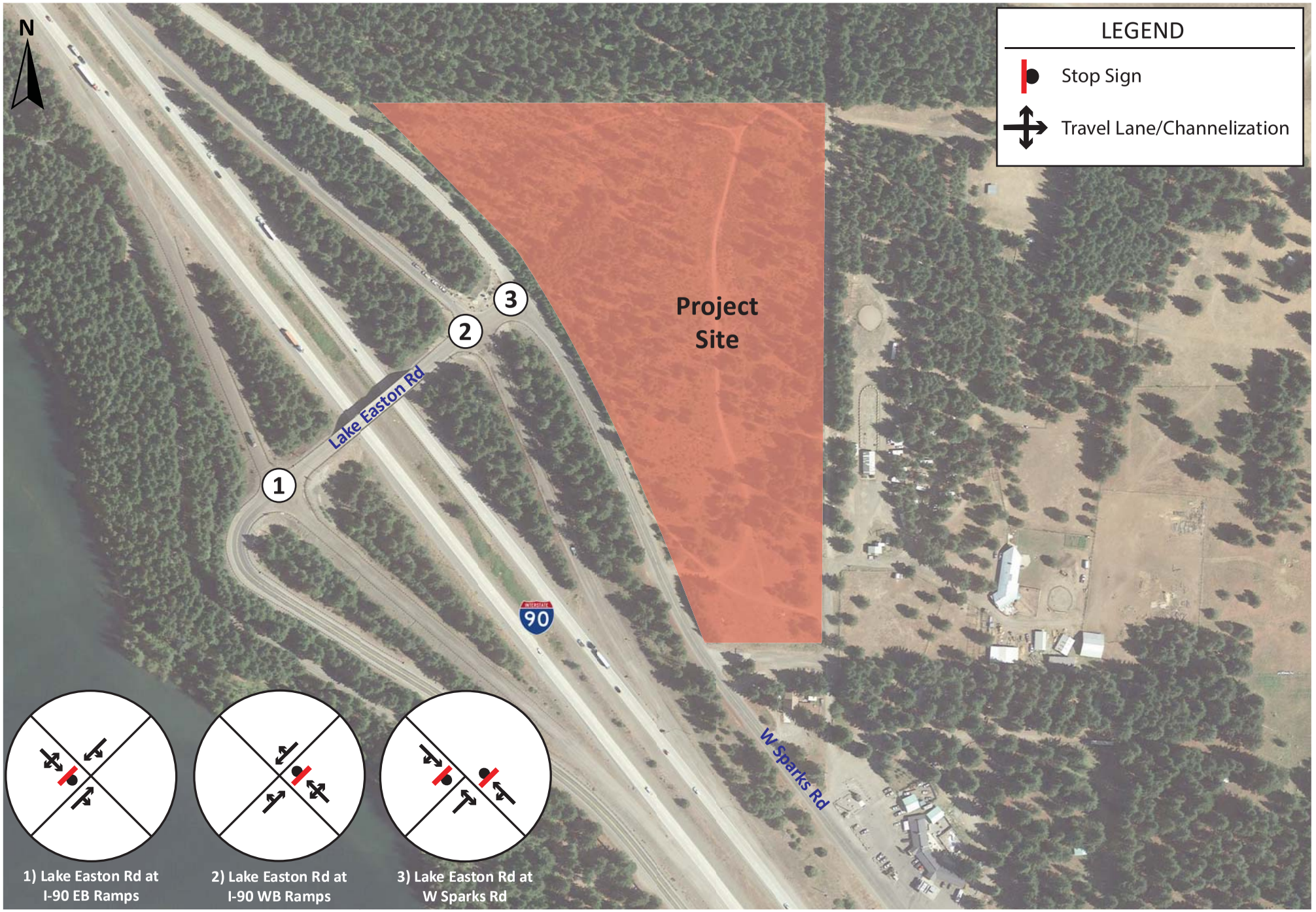
A summary of the intersection channelization and control type for each of the study intersections is provided in **Figure 3.**

3.3 Traffic Volume Data

Traffic Count Consultants (TC2), a transportation data collection service, provided PM peak period turning movement counts at three intersections. The counts were conducted on March 21, 2019 between 3:00 pm and 6:00 pm for the evening peak period. The following locations were counted:

- West Sparks Road/Lake Easton Road
- I-90 Westbound Ramps/Lake Easton Road
- I-90 Eastbound Ramps/Lake Easton Road

A common peak hour for all the study intersections was identified as 3:00-4:00 pm. For movements between the study intersections volume adjustments were applied to balance the throughput. **Figure 4** shows the existing 2019 PM peak hour traffic volumes for the study intersections. The turning movement count diagrams are provided in **Appendix A**.



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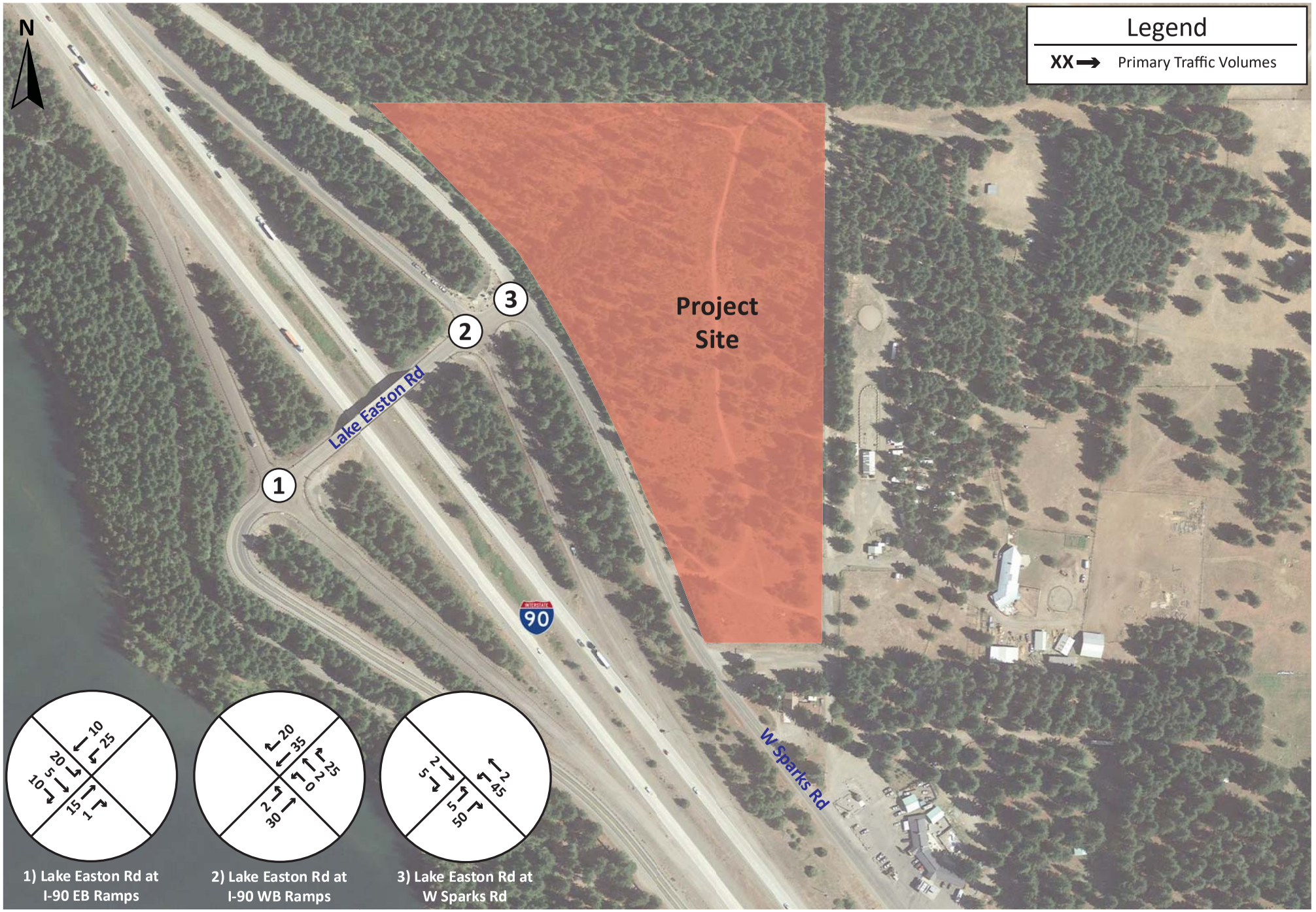
Easton Love's Travel Stop
Traffic Impact Analysis

Figure 3
Existing Lane Channelization and Intersection Control



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Easton Love's Travel Stop
Traffic Impact Analysis

Figure 4
Existing 2019 PM Peak Hour
Traffic Volumes

3.4 Crash History

The Washington Department of Transportation provides crash data for study area roadways. The data was collected over the five-year span between January 1, 2014 and December 31, 2018 and reviewed for the study area intersections. The total crashes by severity are provided in **Table 1**.

Table 1. Existing Crash Severity By Study Intersection

Intersection	Fatal	Serious Injury	Minor Injury	Possible Injury	Property Damage Only	Unknown	Total
I-90 EB Ramps/Lake Easton Road	0	0	0	0	1	0	1
I-90 WB Ramps/Lake Easton Road	0	0	0	0	1	0	1
W Sparks Road/Lake Easton Road	0	0	0	0	3	0	3
Total Crashes	**0**	**0**	**0**	**0**	**5**	**0**	**5**

Crashes involving property damage only (no apparent injury) make up 100 percent of the crashes. Each of the five reported crashes involved just one vehicle striking a guardrail. There were no fatal or serious injury crashes reported during the five years of crash data reviewed.

4 PROJECT TRAFFIC CHARACTERISTICS

The project-related characteristics having the most effect on area traffic conditions are peak hour trip generation and the directional distribution of traffic volumes on the surrounding roadway network.

4.1 Site-Generated Traffic Volumes

Vehicle trip generation was estimated using the trip generation rates contained in the 10th edition of the Trip Generation Manual by the *Institute of Transportation Engineers (ITE)*. The land-use category "Truck Stop" (land-use code 950), "Fast Casual Restaurant" (land-use code 930), "Fast Food Restaurant" (land-use code 934 and "Tire Store" (land-use code 848) were used.

Truck Trips

The trip generation rates include all types of vehicles, and don't differentiate between truck and passenger vehicle traffic. To estimate the amount of total site-generated traffic that would be trucks we referenced the City of Fontana's Truck Trip Generation Study, dated August 2003. Based on our experience with similar facilities, we used a truck trip generation rate of 8.22 trips per truck fueling position to estimate truck traffic for the site. The truck trips would be a subset of the total trip generation calculated for the project using the ITE trip generation rates**.**

Non-Primary Traffic

A project such as a truck stop tends to attract a large amount of traffic from people already driving on roadways in the vicinity. These trips do not represent new traffic on the local roadways (referred to as primary trips) but represent "non-primary" trips according to the following definitions:

> Pass-by trips are trips made as an intermediate stop from an origin to a primary destination (i.e., stopping to shop on the way home from work) by vehicles passing directly adjacent to the project driveway.
>
> Diverted Trips are similar to pass-by trips, except diverted trips require a diversion from their original route onto another roadway to reach the site. These trips are not technically new trips but are new to the roadways in the immediate vicinity.

Pass-by and diverted trip percentages were taken from the 3rd edition of the Trip Generation Handbook by ITE. Information on Fast Casual Restaurant and Fast Food Restaurant was available in the handbook. Information is not provided for the Truck Stop land-use, but ITE provides averages of primary, pass-by and diverted trips for a gasoline/service station with convenience market, which is the most applicable land use category for this project.

Primary trips represent approximately 20 percent of total driveway traffic, and non-primary trips represent the remaining 80 percent. To provide a conservative analysis, and to better reflect traffic patterns to and from this site, the non-primary trip percentages were assumed to be mostly diverted trips from I-90. For this study, we assumed 8 percent pass-by, 72 percent diverted and 20 percent primary trips. These percentages were only applied to the passenger vehicle traffic. For trucks it is assumed that 100 percent of the trips will be diverted from I-90.

A summary of the project trip generation estimate is provided in **Table 2**. The complete project trip generation calculations are included in **Appendix B**.

Table 2. PM Peak Hour Project Trip Generation

Vehicle Type	Total Driveway Trips	Diverted Trips	Pass-by Trips	Primary Trips		
				Enter	Exit	Total
Passenger Vehicles	278	199	22	30	27	57
Trucks	80	80	0	0	0	0
Total Project Traffic	**358**	**279**	**22**	**30**	**27**	**57**

4.2 Site Traffic Distribution and Assignment

For this study, the directional distribution of traffic to and from the proposed project was estimated based on the existing turning movement counts and a review of the surrounding developed areas. For this analysis each trip type was assigned differently. Following is a brief explanation of each assignment.

Truck Trips

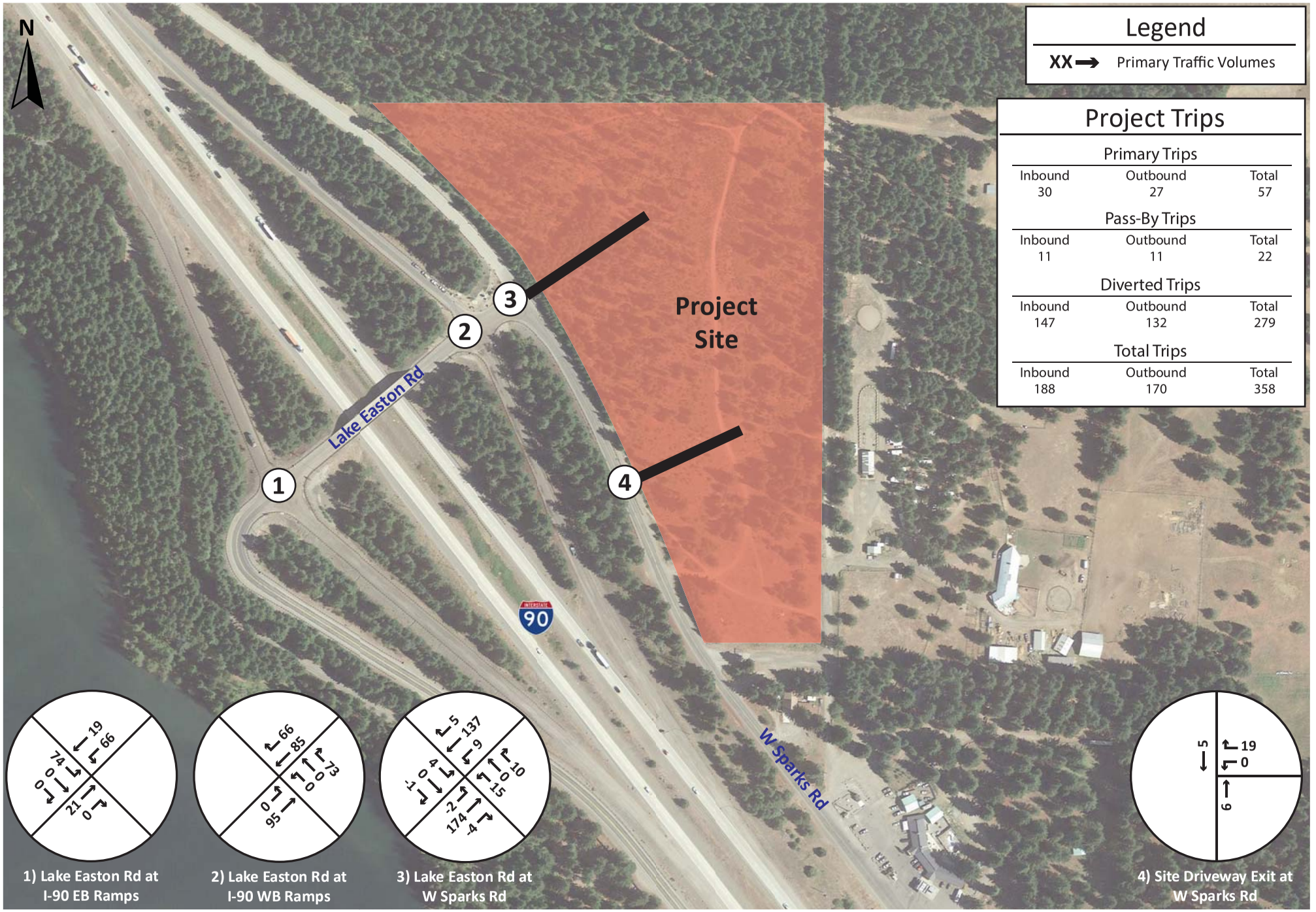
100 percent of the truck trips are assumed to be diverted from Interstate 90, with 50 percent drawn from each direction. None of the truck trips are considered pass-by or primary trips.

Passenger Vehicle Trips:

The passenger vehicle trips are comprised of diverted trips, pass-by trips and primary trips.

- The diverted trips were assumed to be drawn from I-90, with 50 percent drawn from each direction;
- The pass-by trips were assigned to West Sparks Road based on an estimate of current traffic volumes along the project frontage;
- The primary trips were assumed to travel between the site and other household and commercial populations in Easton, mostly located south of the project and west of I-90.

The site traffic distribution and assignment showing the sum of passenger vehicle and truck trips is provided on **Figure 5.** Separate figures that show the diverted trip distribution and assignment and Pass-by distribution and assignment are included in **Appendix B**.



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Easton Love's Travel Stop
Traffic Impact Analysis

Figure 5
PM Peak Hour Total
Site Generated Traffic Volumes

5 FUTURE TRAFFIC CONDITIONS

5.1 Roadway Network Improvements

The transportation element of Kittitas County's current comprehensive plan, published in 2008, does not identify any capacity improvements in the study area

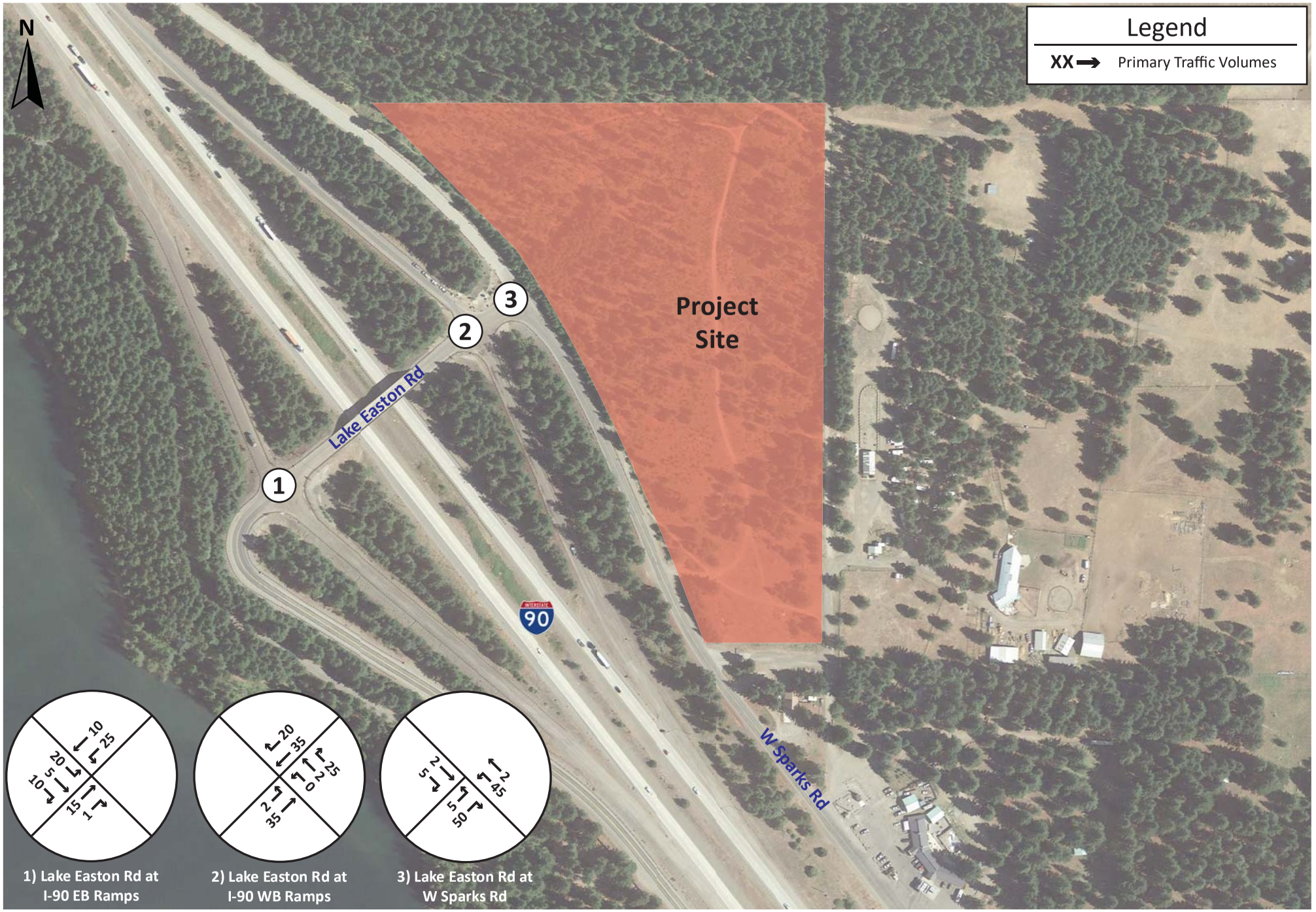
5.2 Future Traffic Volumes

Traffic volume forecasts were prepared for PM peak hour conditions for the 2020 opening year. The future traffic volume forecast includes non-specific background traffic growth and estimated traffic generated by the proposed Love's Travel Stop.

For the non-specific background growth, we used 2.0 percent annual growth rate (non-compounded) in our calculations. This growth rate was based on the historic growth pattern on I-90 based on Annualized Average Daily Traffic (AADT) volumes available in WSDOT's *Annual Traffic Report*. Several editions of this publication were used to review the growth over several years.

The projected 2020 traffic volumes without the *Love's Travel Stop* are shown on **Figure 6.** The projected 2020 traffic volumes with the project are shown on **Figure 7.**

The traffic volume calculations for the study intersections are included in **Appendix B**.



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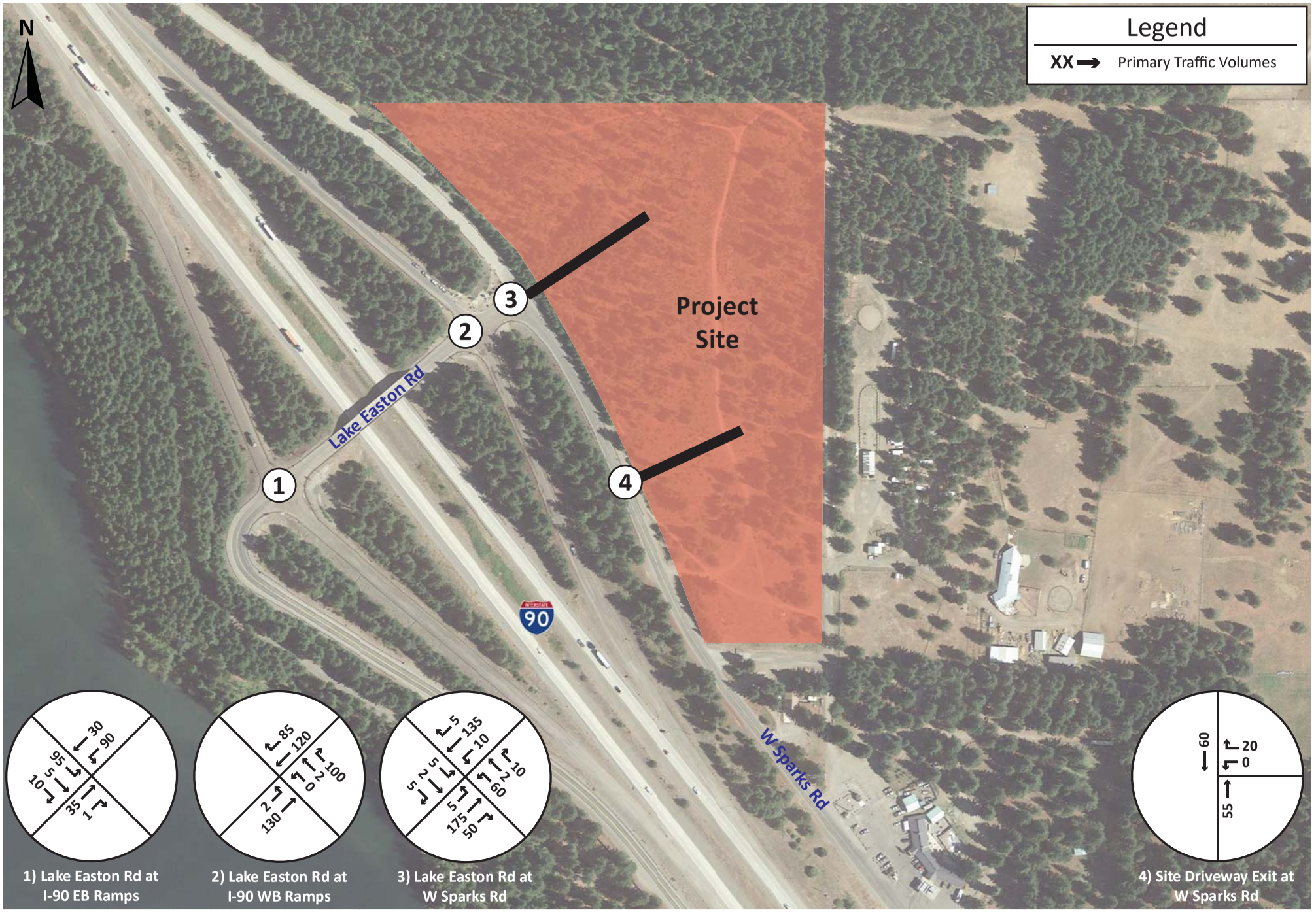
Easton Love's Travel Stop
Traffic Impact Analysis

Figure 6
Projected 2020 PM Peak Hour
Traffic Volumes without Project



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Easton Love's Travel Stop
Traffic Impact Analysis

Figure 7
Projected 2020 PM Peak Hour
Traffic Volumes with Project

6 TRAFFIC OPERATIONS ANALYSIS

Traffic analyses were conducted to identify any deficiencies within the study area for the PM peak hour in the 2019 base year and the 2020 project opening year.

6.1 Level of Service

The acknowledged source for determining overall capacity for arterial segments and independent intersections is the current edition of the *Highway Capacity Manual* (HCM) published by the Transportation Research Board (TRB). Capacity analyses were completed for the base year and projected 2020 traffic volume scenarios.

Intersection analysis was performed using the Synchro/SimTraffic software package. This software implements the methods of the 6th Edition HCM. Capacity analysis results are described in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a street or highway during a specific time interval. LOS ranges from A (very little delay) to F (long delays and congestion). The software does not provide level of service results for the unusual geometric control conditions present at W Sparks Road/Lake Easton Road. For this location the level of service results were reported from the SimTraffic simulations. For the SimTraffic results the average of five traffic operational simulations was used.

Kittitas County's *Comprehensive Plan* identifies a LOS C standard for rural areas. Transportation improvements would generally be necessary where LOS C operations is exceeded.

6.1.1 Intersection Operations

For intersections under minor street stop-control, the LOS of the most difficult movement (typically the minor street left-turn) represents the intersection Level of Service for purposes of assessing potential impacts. For traffic signals, the intersection average delay is used to assess potential impacts. The following table shows the Level of Service criteria for stop-controlled intersections and signalized intersections.

Table 3. Level of Service Criteria for Intersections

Level of Service	Stop-Controlled Intersection Average Control Delay (seconds/vehicle)
A	≤ 10
B	> 10-15
C	> 15-25
D	> 25-35
E	> 35-50
F	> 50

6.2 Intersection Analysis

The analysis was conducted for the following scenarios:

- Existing 2019 traffic volumes
- Projected 2020 background traffic volumes without the *Love's Travel Stop* project

- Projected 2020 traffic volumes with the *Love's Travel Stop* project

Truck volumes were collected in the turning movement counts and used in the 2019 existing and 2020 background traffic analysis. With completion of the project, the truck percentages were adjusted to account for the truck traffic volumes anticipated at the *Love's Travel Stop*. This adjusted percentage was used in the 2020 analysis with Love's in place.

The traffic analysis worksheets are provided in **Appendix C**.

6.2.1 I-90 Eastbound Ramps/Lake Easton Road

This intersection operates under stop sign-control for the eastbound off-ramp, with each approach providing a single travel lane.

In the 2019 PM peak hour, the intersection operates at LOS A with 9.0 seconds of average delay per vehicle for the worst movement. For the 2020 horizon year without the Love's project, the intersection is projected to remain at LOS A with 9.0 seconds of average delay. With the addition of project traffic, the intersection is projected to operate at LOS B in 2020, with 11.7 seconds of average delay.

6.2.2 I-90 Westbound Ramps/Lake Easton Road

This intersection operates under stop sign-control for the eastbound off-ramp, with each approach providing a single travel lane.

In the 2019 PM peak hour, the intersection operates at LOS A with 8.6 seconds of average delay for the worst movement. For the 2020 horizon without the Love's project, the intersection is projected to remain at LOS A with 8.7 seconds of average delay. With the addition of project traffic, the intersection is projected to operate at LOS B, with 10.0 seconds of average delay.

6.2.3 W Sparks Road/Lake Easton Road

This intersection is located approximately 100 feet northeast intersection of Lake Easton Road with the I-90 WB ramps. To best accommodate this tight spacing, the northeast-bound Lake Easton Road approach to this intersection is uncontrolled. Both approaches of W Sparks Road operate under stop-sign control. Each approach provides a single travel lane. With the project this intersection will add a fourth (southwest-bound) approach serving as the north driveway to the site. This fourth approach will also be stop-sign controlled.

Due to the uncommon intersection control, the SimTraffic simulation tool within the Synchro software package was used to calculate the average delay for the stop-controlled movements. In the 2019 PM peak hour, the intersection operates at LOS A with 8.7 seconds of average delay for the worst movement. For the 2020 horizon without the Love's project, the intersection is projected to remain at LOS A with 8.7 seconds of average delay. With the addition of project traffic and a fourth approach leg, the intersection is projected to operate at LOS A, with 6.9 seconds of average delay. While the worst movement is reporting as less delay, the overall average delay experienced at the intersection increases with the project, going from 2.2 seconds today to 2.9 seconds with the project.

6.2.4 Site Driveways

The project is proposed with two access driveways on West Sparks Road. The south driveway will provide passenger vehicle access to the fuel pumps and convenience store. The north driveway will provide access for trucks to the truck parking, fueling and service areas.

6.2.4.1 Right Turn Lane Warrants

Right turn lane warrants were reviewed for each site driveway based on forecasted 2020 PM peak hour traffic volumes, using the right turn lane warrant from the WSDOT design manual (exhibit 1310-11). The warrant is included in **Appendix D**. Both driveways are projected to serve less than 20 right-turn vehicles in the peak hour, which is below the minimum amount to meet warrants for a right-turn pocket or taper.

We have prepared analysis of the site driveway intersections with stop control for the minor approaches. Both driveways will be tee intersections. With these geometric conditions the site driveway intersections are each projected to operate at LOS A for the forecasted 2020 opening year.

6.2.5 LOS Analysis Summary

The operational analysis results of the study intersections for the PM peak hour are provided in **Table 4**. The LOS analysis worksheets are included in **Appendix C**.

Table 4. PM Peak Hour Intersection Level of Service

Intersection	Control Type	LOS Standard	Base Year 2019		Projected 2020			
					Without Project		With Project	
			LOS (delay)	Reported Approach	LOS (delay)	Reported Approach	LOS (delay)	Reported Approach
I-90 EB Ramps/Lake Easton Rd	TWSC[1]	C	A (9.0)	EB Off-ramp	A (9.0)	EB Off-ramp	B (11.7)	EB Off-ramp
I-90 WB Ramps/Lake Easton Rd	TWSC[1]	C	A (8.6)	WB off-ramp	A (8.7)	WB off-ramp	B (10.0)	WB off-ramp
W Sparks Rd/Lake Easton Rd/North Site Driveway[2]	TWSC[1]	C	A (8.7)	SB Sparks Road	A (8.7)	EB Sparks Road	A (6.9)	Site Driveway
W Sparks Rd/South Site Driveway	TWSC[1]	C	N/A	N/A	N/A	N/A	A (9.8)	Site Driveway

1. Two-Way Stop-Control
2. Analysis results based on SimTraffic simulations

7 SUMMARY AND CONCLUSION

Love's Travel Stops & Country Stores plans to construct the Easton *Love's Travel Stop* on West Sparks Road near the I-90 Exit 70 interchange (Lake Easton Road). The project will consist of a new truck stop facility that will provide passenger vehicle and truck fueling, a convenience market and food service, a tire shed for trucks, and overnight truck parking. There will be a diesel fueling island with 9 fueling positions and a gasoline island with 16 fueling positions. The tire shed will have three-bays for tire replacement and light service for trucks. There will be 117 truck parking stalls for overnight parking, 80 passenger vehicle stalls and 3 RV parking stalls.

At full occupancy and operation, the project is estimated to generate approximately 360 trip ends during the PM peak hour at the site's driveways. Most of these trips (78 percent) will be drawn from traffic already traveling on I-90. This report has been prepared to provide the traffic analysis and project information for Kittitas County and WSDOT to use in the environmental review of the project.

Based on the analysis described in this report, all the study area intersections are projected to operate at or better than the Kittitas County LOS C standard.

APPENDIX A
TRAFFIC VOLUME COUNTS

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Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

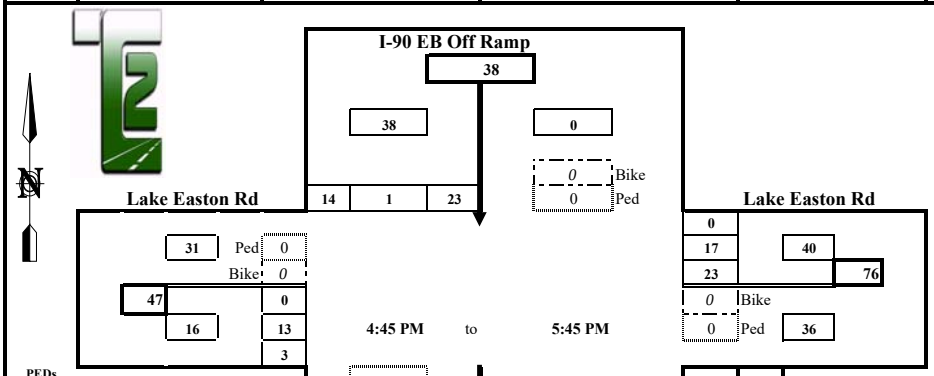
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-90 EB Ramps & Lake Easton Rd **Date of Count:** Thurs 3/21/2019

Location: Easton, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-90 EB Off Ramp				From South on (NB) I-90 EB On Ramp				From East on (WB) Lake Easton Rd				From West on (EB) Lake Easton Rd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
3:15 P	0	8	1	2	0	0	0	0	0	7	1	0	1	0	2	0	21
3:30 P	0	6	0	1	0	0	0	0	1	6	2	0	0	0	2	1	18
3:45 P	1	3	2	2	0	0	0	0	0	3	4	0	0	0	6	1	21
4:00 P	0	3	1	6	0	0	0	0	0	7	2	0	0	0	4	0	23
4:15 P	0	7	0	1	0	0	0	0	0	7	1	0	0	0	1	1	18
4:30 P	0	6	1	5	0	0	0	0	0	5	3	0	0	0	1	0	21
4:45 P	0	6	1	1	0	0	0	0	0	3	2	0	0	0	2	1	16
5:00 P	0	3	0	6	0	0	0	0	1	5	5	0	0	0	4	0	23
5:15 P	0	13	0	4	0	0	0	0	1	4	6	0	0	0	3	1	31
5:30 P	1	4	1	1	0	0	0	0	0	9	1	0	0	0	2	1	19
5:45 P	0	3	0	3	0	0	0	0	0	5	5	0	0	0	4	1	21
6:00 P	0	9	0	3	0	0	0	0	0	4	1	0	0	0	1	0	18
Total Survey	2	71	7	35	0	0	0	0	3	65	33	0	1	0	32	7	250
Peak Hour: 4:45 PM to 5:45 PM																	
Total	1	23	1	14	0	0	0	0	2	23	17	0	0	0	13	3	94
Approach	38				0				40				16				94
%HV	2.6%				n/a				5.0%				n/a				3.2%
PHF	0.56				n/a				1.00				0.80				0.76



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

124 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.80	n/a
Check	WB	1.00	5.0%
In:	94 NB	n/a	n/a
Out:	94 SB	0.56	2.6%
	T Int.	0.76	3.2%

Conditions:

Special Notes

SCJ19044M_01p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

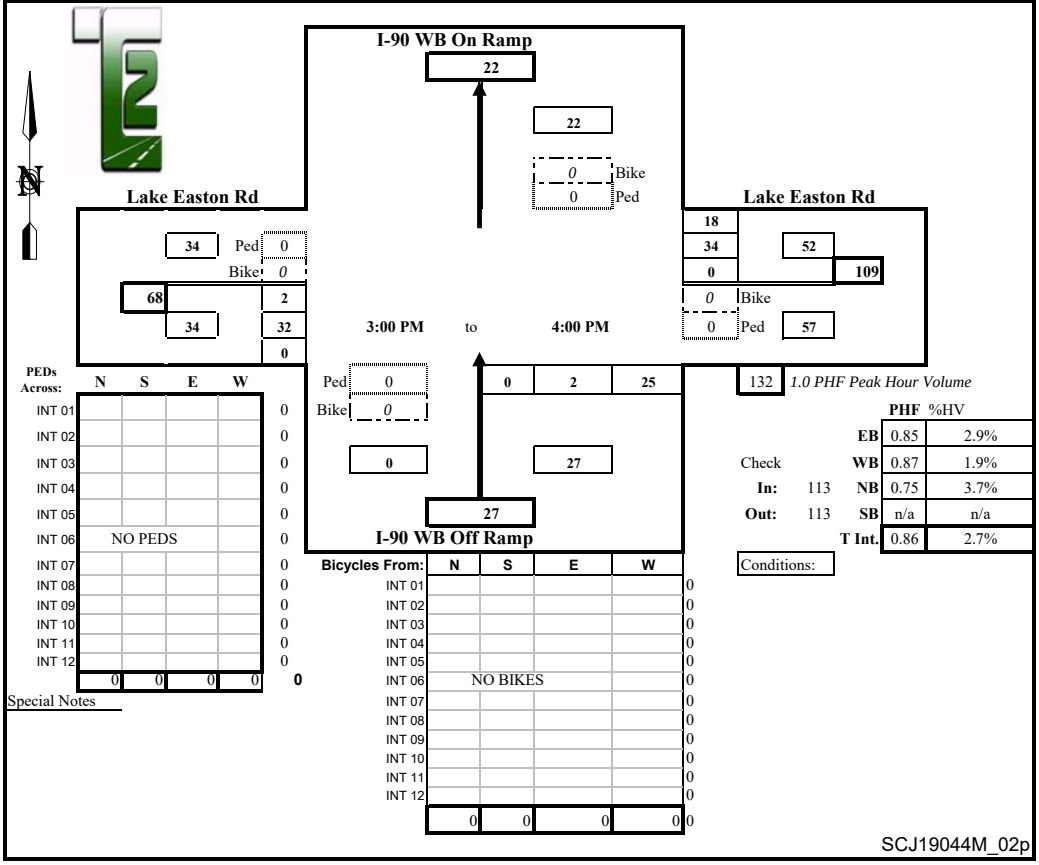
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-90 WB Ramps & Lake Easton Rd **Date of Count:** Thurs 3/21/2019

Location: Easton, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-90 WB On Ramp				From South on (NB) I-90 WB Off Ramp				From East on (WB) Lake Easton Rd				From West on (EB) Lake Easton Rd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
3:15 P	0	0	0	0	0	0	0	9	0	0	9	3	1	0	9	0	30
3:30 P	0	0	0	0	0	0	0	8	1	0	7	8	0	1	9	0	33
3:45 P	0	0	0	0	0	0	2	3	0	0	7	5	0	0	7	0	24
4:00 P	0	0	0	0	1	0	0	5	0	0	11	2	0	1	7	0	26
4:15 P	0	0	0	0	0	0	1	4	0	0	6	3	0	0	8	0	22
4:30 P	0	0	0	0	0	0	0	6	0	0	9	3	0	0	7	0	25
4:45 P	0	0	0	0	1	0	0	8	0	0	5	3	0	1	8	0	25
5:00 P	0	0	0	0	0	0	0	6	1	0	11	3	0	0	7	0	27
5:15 P	0	0	0	0	0	0	0	4	1	0	9	2	0	0	15	0	30
5:30 P	0	0	0	0	0	0	0	6	0	0	11	4	0	1	4	0	26
5:45 P	0	0	0	0	0	0	0	1	0	0	9	1	0	0	8	0	19
6:00 P	0	0	0	0	0	0	0	7	0	0	6	0	0	0	9	0	22
Total Survey	0	0	0	0	2	0	3	67	3	0	100	37	1	4	98	0	309
Peak Hour: 3:00 PM to 4:00 PM																	
Total	0	0	0	0	1	0	2	25	1	0	34	18	1	2	32	0	113
Approach	0				27				52				34				113
%HV	n/a				3.7%				1.9%				2.9%				2.7%
PHF	n/a				0.75				0.87				0.85				0.86



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

	PHF	%HV
EB	0.85	2.9%
WB	0.87	1.9%
NB	0.75	3.7%
SB	n/a	n/a
T Int.	0.86	2.7%

Check In: 113 Out: 113

Conditions:

Special Notes

SCJ19044M_02p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

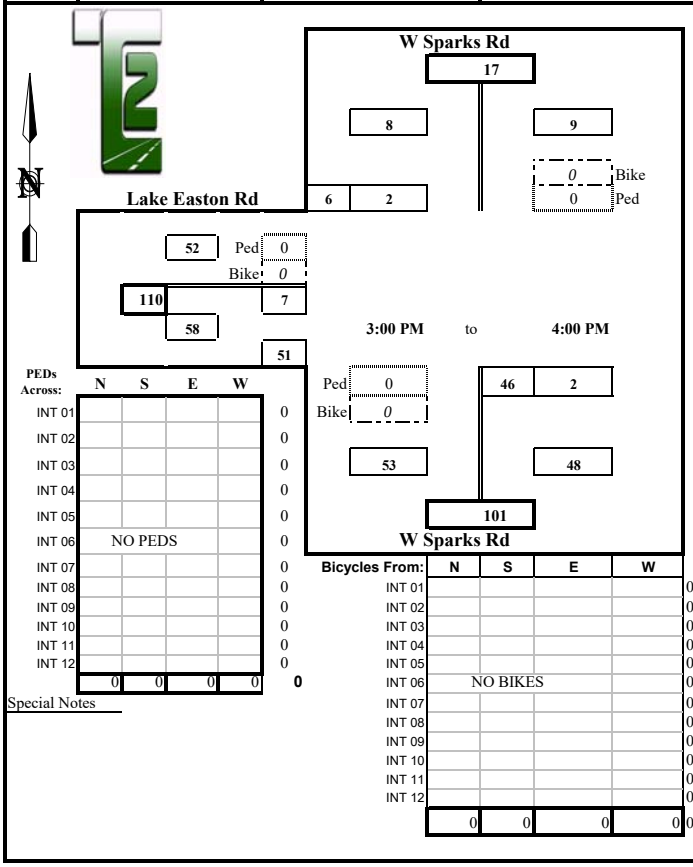
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: W Sparks Rd & Lake Easton Rd **Date of Count:** Thurs 3/21/2019

Location: Easton, Washington **Checked By:** Jess

Time Interval	From North on (SB) W Sparks Rd				From South on (NB) W Sparks Rd				From East on (WB) 0				From West on (EB) Lake Easton Rd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
3:15 P	0	0	0	0	0	13	0	0	0	0	0	0	1	3	0	16	32
3:30 P	1	0	1	3	1	11	0	0	0	0	0	0	0	2	0	15	32
3:45 P	0	0	0	0	0	12	1	0	0	0	0	0	0	1	0	9	23
4:00 P	0	0	1	3	0	10	1	0	0	0	0	0	1	1	0	11	27
4:15 P	0	0	0	2	0	7	0	0	0	0	0	0	0	0	0	12	21
4:30 P	0	0	0	1	0	11	1	0	0	0	0	0	0	4	0	9	26
4:45 P	0	0	1	1	0	7	0	0	0	0	0	0	1	2	0	14	25
5:00 P	0	0	0	2	1	12	0	0	0	0	0	0	0	2	0	11	27
5:15 P	0	0	0	0	1	11	1	0	0	0	0	0	0	2	0	18	32
5:30 P	0	0	2	0	1	15	1	0	0	0	0	0	0	3	0	6	27
5:45 P	0	0	1	2	0	8	0	0	0	0	0	0	0	2	0	7	20
6:00 P	0	0	0	2	0	7	0	0	0	0	0	0	1	2	0	14	25
Total Survey	1	0	6	16	4	124	5	0	0	0	0	0	4	24	0	142	317
Peak Hour: 3:00 PM to 4:00 PM																	
Total	1	0	2	6	1	46	2	0	0	0	0	0	2	7	0	51	114
Approach	8				48				0				58				114
%HV	12.5%				2.1%				n/a				3.4%				3.5%
PHF	0.50				0.92				n/a				0.76				0.89



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Special Notes

128 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.76	3.4%
Check	WB	n/a	n/a
In: 114	NB	0.92	2.1%
Out: 114	SB	0.50	12.5%
	T Int.	0.89	3.5%

Conditions:

SCJ19044M_03p

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APPENDIX B

TRAFFIC VOLUME CALCULATION WORKSHEETS

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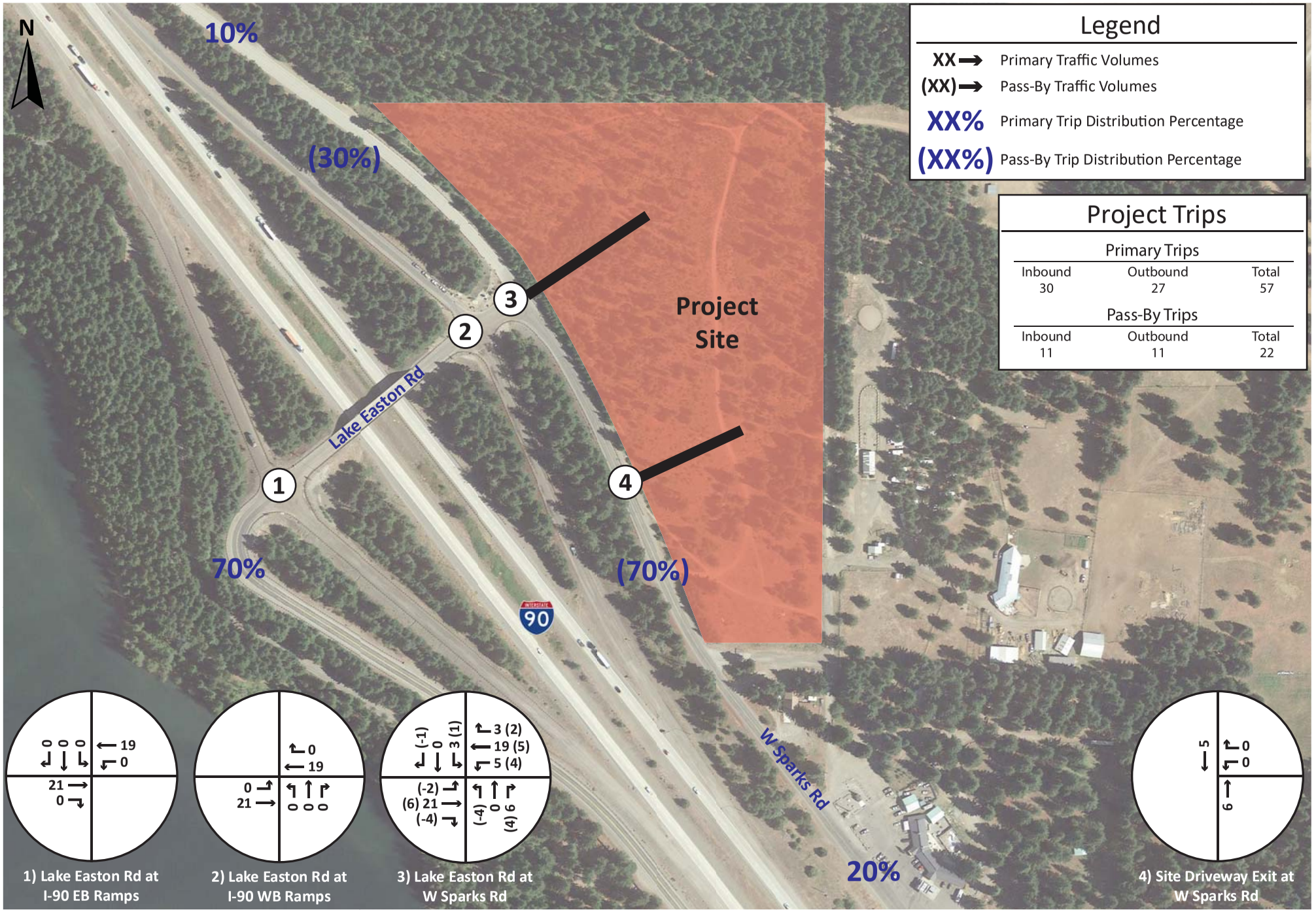
SCJ ALLIANCE
CONSULTING SERVICES

Easton Love's Travel Stop

Trip Generation

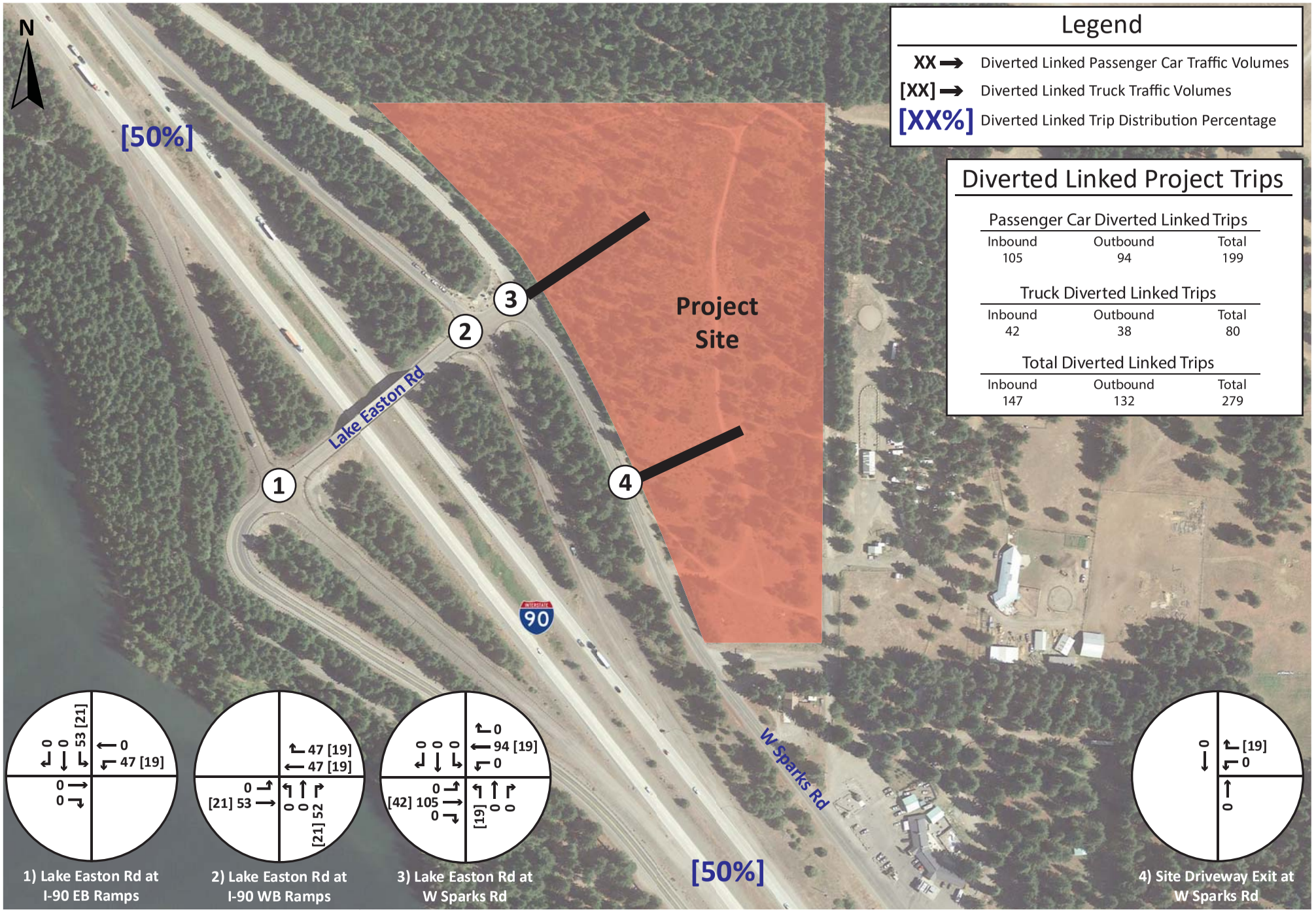
PM Peak Hour Trip Generation																					
Site Plan Description	LUC	ITE Description	Variable	Value	Trip Rate	Distribution		Total Trips			Internal Capture		Non-Primary		Diverted Link		Pass-By Trips		Primary Trips		
						In	Out	In	Out	Total	%	Total	%	Total	%	Total	%	Total	In	Out	Total
Fueling/Convenience Market - Total	*950*	*Truck Stop*	*1,000-sf gfa*	*9.500*	*22.73*	*53%*	*47%*	*114*	*102*	*216*											
Love's Travel Stop - Trucks	950	Truck Stop	Pumps	9.000	8.22	53%	47%	39	35	74	0%	0	100%	74	100%	74	0%	0	0	0	0
Love's Travel Stop - Passenger Cars	950	Truck Stop	1,000-sf gfa			53%	47%	75	67	142	0%	0	88%	125	80%	114	8%	11	10	7	17
Three Bay Tire Shop - Total	*848*	*Tire Store*	*Service Bay*	*3.0*	*3.42*	*42%*	*58%*	*4*	*6*	*10*											
Three Bay Tire Shop - Trucks	848	Tire Store	Service Bay		60%	42%	58%	3	3	6	0%	0	100%	6	100%	6	0%	0	0	0	0
Three Bay Tire Shop - Passenger Cars	848	Tire Store	Service Bay		40%	42%	58%	1	3	4	0%	0	0%	0	0%	0	0%	0	1	3	4
Counter Service Restaurant	930	Fast Casual Restaurant	1,000-sf gfa	1.648	14.13	55%	45%	13	10	23	0%	0	69%	16	60%	14	9%	2	4	3	7
Fast Food Restaurant with Drive-Through Window	934	Fast Food Restaurant with Drive	1,000-sf gfa	3.332	32.67	52%	48%	57	52	109	0%	0	73%	80	65%	71	8%	9	15	14	29
Truck Stop Total						**52.5%**	**47.5%**	**188**	**170**	**358**	**0%**	**0**		**301**		**279**		**22**	**30**	**27**	**57**



SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

Easton Love's Travel Stop
Traffic Impact Analysis

Figure A
PM Peak Hour Primary and Pass-By Site Generated Traffic Volumes



SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

Easton Love's Travel Stop
Traffic Impact Analysis

Figure B
PM Peak Hour Diverted
Site Generated Traffic Volumes

SCJ ALLIANCE
CONSULTING SERVICES

Easton Love's Travel Stop

PM Peak Hour Volumes

Growth Rate: 2.00%

Intersection	Movement		Existing 2019 Volumes	Count Balancing	**Balanced 2019 Volumes**	Background 2020 Growth	**Baseline 2020 Volumes**	Primary Car Trips	Pass-By Car Trips	Diverted Car Trips	Diverted Truck Trips	**Site Generated Volumes**	**Projected 2020 Volumes**
		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
	EB	T	14	0	**14**	0	**14**	21	0	0	0	**21**	**35**
		R	1	0	**1**	0	**1**	0	0	0	0	**0**	**1**
1		L	23	2	**25**	1	**26**	0	0	47	19	**66**	**92**
Lake Easton Road	WB	T	9	0	**9**	0	**9**	19	0	0	0	**19**	**28**
I-90 EB Ramps		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
TMC Date: 03/21/2019	NB	T	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
3:00 - 4:00		L	20	0	**20**	0	**20**	0	0	53	21	**74**	**94**
PHF: 0.90	SB	T	4	0	**4**	0	**4**	0	0	0	0	**0**	**4**
		R	11	0	**11**	0	**11**	0	0	0	0	**0**	**11**
			82									**180**	**266**
		L	2	0	**2**	0	**2**	0	0	0	0	**0**	**2**
	EB	T	32	0	**32**	1	**33**	21	0	53	21	**95**	**128**
		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
2		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
Lake Easton Road	WB	T	34	0	**34**	1	**35**	19	0	47	19	**85**	**120**
I-90 WB Ramps		R	18	0	**18**	0	**18**	0	0	47	19	**66**	**84**
		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
TMC Date: 03/21/2019	NB	T	2	0	**2**	0	**2**	0	0	0	0	**0**	**2**
		R	25	1	**26**	1	**27**	0	0	52	21	**73**	**100**
3:00 - 4:00		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
PHF: 0.86	SB	T	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
			113									**319**	**435**
		L	7	0	**7**	0	**7**	0	-2	0	0	**-2**	**5**
	EB	T	0	0	**0**	0	**0**	21	6	105	42	**174**	**174**
		R	51	0	**51**	1	**52**	0	-4	0	0	**-4**	**48**
3		L	0	0	**0**	0	**0**	5	4	0	0	**9**	**9**
Lake Easton Road	WB	T	0	0	**0**	0	**0**	19	5	94	19	**137**	**137**
W Spark Road		R	0	0	**0**	0	**0**	3	2	0	0	**5**	**5**
		L	46	0	**46**	1	**47**	0	-4	0	19	**15**	**62**
TMC Date: 03/21/2019	NB	T	2	0	**2**	0	**2**	0	0	0	0	**0**	**2**
		R	0	0	**0**	0	**0**	6	4	0	0	**10**	**10**
3:00 - 4:00		L	0	0	**0**	0	**0**	3	1	0	0	**4**	**4**
PHF: 0.89	SB	T	2	0	**2**	0	**2**	0	0	0	0	**0**	**2**
		R	6	0	**6**	0	**6**	0	-1	0	0	**-1**	**5**
			114				**116**					**347**	**463**
		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
	EB	T	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
4		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
Site Driveway	WB	T	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
W Spark Road		R	0	0	**0**	0	**0**	0	0	0	19	**19**	**19**
		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
	NB	T	48	0	**48**	1	**49**	6	0	0	0	**6**	**55**
		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
		L	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
	SB	T	53	0	**53**	1	**54**	5	0	0	0	**5**	**59**
		R	0	0	**0**	0	**0**	0	0	0	0	**0**	**0**
			101				**103**					**30**	**133**

APPENDIX C
CAPACITY ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	5.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	20	5	10	0	0	0	0	15	1	25	10	0
Future Vol, veh/h	20	5	10	0	0	0	0	15	1	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	22355	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	0	0	0	7	7	7	3	3	3
Mvmt Flow	22	6	11	0	0	0	0	17	1	28	11	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	85	85	11	-	0	0	18	0	0
Stage 1	67	67	-	-	-	-	-	-	-
Stage 2	18	18	-	-	-	-	-	-	-
Critical Hdwy	6.43	6.53	6.23	-	-	-	4.13	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.43	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	-	-	-	2.227	-	-
Pot Cap-1 Maneuver	914	803	1067	0	-	-	1592	-	0
Stage 1	953	837	-	0	-	-	-	-	0
Stage 2	1002	878	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	898	0	1067	-	-	-	1592	-	-
Mov Cap-2 Maneuver	898	0	-	-	-	-	-	-	-
Stage 1	953	0	-	-	-	-	-	-	-
Stage 2	984	0	-	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9	0	5.2
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	SELn1	SWL	SWT
Capacity (veh/h)	-	-	948	1592	-
HCM Lane V/C Ratio	-	-	0.041	0.017	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	2	25	2	30	0	0	35	20
Future Vol, veh/h	0	0	0	1	2	25	2	30	0	0	35	20
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, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	4	4	4	3	3	3	2	2	2
Mvmt Flow	0	0	0	1	2	29	2	35	0	0	41	23

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	92	103	35	64	0	-	-	-	0
Stage 1	39	39	-	-	-	-	-	-	-
Stage 2	53	64	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.13	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.227	-	-	-	-	-
Pot Cap-1 Maneuver	903	783	1032	1532	-	0	0	-	-
Stage 1	978	859	-	-	-	0	0	-	-
Stage 2	964	838	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	902	0	1032	1532	-	-	-	-	-
Mov Cap-2 Maneuver	902	0	-	-	-	-	-	-	-
Stage 1	977	0	-	-	-	-	-	-	-
Stage 2	964	0	-	-	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	8.6	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	NWLn1	SWT	SWR
Capacity (veh/h)	1532	-	1026	-	-
HCM Lane V/C Ratio	0.002	-	0.032	-	-
HCM Control Delay (s)	7.4	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

1: Lake Easton Road & I-90 EB Ramps Performance by movement

Movement	SEL	SET	SER	NET	NER	SWL	SWT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Total Del/Veh (s)	4.5	5.8	2.5	0.0	0.0	1.8	0.3	2.2

2: Lake Easton Road & I-90 WB Ramps Performance by movement

Movement	NWL	NWT	NWR	NEL	NET	SWT	SWR	All
Denied Del/Veh (s)		0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)		6.2	2.5	2.7	0.7	0.6	0.5	1.1

3: Lake Easton Road & W Sparks Road Performance by movement

Movement	SET	SER	NWL	NWT	NEL	NER	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	8.7	2.5	4.3	4.8	0.1	0.1	2.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	4.3

Intersection	
Int Delay, s/veh	5.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	20	5	10	0	0	0	0	15	1	25	10	0
Future Vol, veh/h	20	5	10	0	0	0	0	15	1	25	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	22355	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	0	0	0	7	7	7	3	3	3
Mvmt Flow	22	6	11	0	0	0	0	17	1	28	11	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	85	85	11	-	0	0	18	0	0
Stage 1	67	67	-	-	-	-	-	-	-
Stage 2	18	18	-	-	-	-	-	-	-
Critical Hdwy	6.43	6.53	6.23	-	-	-	4.13	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.43	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	-	-	-	2.227	-	-
Pot Cap-1 Maneuver	914	803	1067	0	-	-	1592	-	0
Stage 1	953	837	-	0	-	-	-	-	0
Stage 2	1002	878	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	898	0	1067	-	-	-	1592	-	-
Mov Cap-2 Maneuver	898	0	-	-	-	-	-	-	-
Stage 1	953	0	-	-	-	-	-	-	-
Stage 2	984	0	-	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9	0	5.2
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	SELn1	SWL	SWT
Capacity (veh/h)	-	-	948	1592	-
HCM Lane V/C Ratio	-	-	0.041	0.017	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	2	25	2	35	0	0	35	20
Future Vol, veh/h	0	0	0	1	2	25	2	35	0	0	35	20
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, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	4	4	4	3	3	3	2	2	2
Mvmt Flow	0	0	0	1	2	29	2	41	0	0	41	23

Major/Minor	Minor1		Major1			Major2			
Conflicting Flow All	98	109	41	64	0	-	-	-	0
Stage 1	45	45	-	-	-	-	-	-	-
Stage 2	53	64	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.13	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.227	-	-	-	-	-
Pot Cap-1 Maneuver	896	777	1024	1532	-	0	0	-	-
Stage 1	972	853	-	-	-	0	0	-	-
Stage 2	964	838	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	895	0	1024	1532	-	-	-	-	-
Mov Cap-2 Maneuver	895	0	-	-	-	-	-	-	-
Stage 1	971	0	-	-	-	-	-	-	-
Stage 2	964	0	-	-	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	8.7	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	NWLn1	SWT	SWR
Capacity (veh/h)	1532	-	1018	-	-
HCM Lane V/C Ratio	0.002	-	0.032	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

1: Lake Easton Road & I-90 EB Ramps Performance by movement

Movement	SEL	SET	SER	NET	NER	SWL	SWT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Total Del/Veh (s)	4.5	5.8	2.5	0.0	0.0	1.8	0.3	2.2

2: Lake Easton Road & I-90 WB Ramps Performance by movement

Movement	NWL	NWT	NWR	NEL	NET	SWT	SWR	All
Denied Del/Veh (s)		0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)		6.2	2.5	2.7	0.7	0.6	0.5	1.1

3: Lake Easton Road & W Sparks Road Performance by movement

Movement	SET	SER	NWL	NWT	NEL	NER	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	8.7	2.5	4.3	4.8	0.1	0.1	2.2

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	4.3

Intersection	
Int Delay, s/veh	7.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	95	5	10	0	0	0	0	35	1	90	30	0
Future Vol, veh/h	95	5	10	0	0	0	0	35	1	90	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	22355	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	20	3	3	0	0	0	7	7	7	17	3	3
Mvmt Flow	106	6	11	0	0	0	0	39	1	100	33	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	273	273	33	-	0	0	40	0	0
Stage 1	233	233	-	-	-	-	-	-	-
Stage 2	40	40	-	-	-	-	-	-	-
Critical Hdwy	6.6	6.53	6.23	-	-	-	4.27	-	-
Critical Hdwy Stg 1	5.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.6	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4.027	3.327	-	-	-	2.353	-	-
Pot Cap-1 Maneuver	680	632	1038	0	-	-	1478	-	0
Stage 1	765	710	-	0	-	-	-	-	0
Stage 2	938	860	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	633	0	1038	-	-	-	1478	-	-
Mov Cap-2 Maneuver	633	0	-	-	-	-	-	-	-
Stage 1	765	0	-	-	-	-	-	-	-
Stage 2	873	0	-	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	11.7	0	5.7
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	SELn1	SWL	SWT
Capacity (veh/h)	-	-	657	1478	-
HCM Lane V/C Ratio	-	-	0.186	0.068	-
HCM Control Delay (s)	-	-	11.7	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-

Intersection	
Int Delay, s/veh	2.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	2	100	2	130	0	0	120	85
Future Vol, veh/h	0	0	0	1	2	100	2	130	0	0	120	85
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, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	4	4	22	3	17	3	2	10	10
Mvmt Flow	0	0	0	1	2	116	2	151	0	0	140	99

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	345	394	151	239	0	-	-	-	0
Stage 1	155	155	-	-	-	-	-	-	-
Stage 2	190	239	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.42	4.13	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.498	2.227	-	-	-	-	-
Pot Cap-1 Maneuver	648	539	845	1322	-	0	0	-	-
Stage 1	868	766	-	-	-	0	0	-	-
Stage 2	838	704	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	647	0	845	1322	-	-	-	-	-
Mov Cap-2 Maneuver	647	0	-	-	-	-	-	-	-
Stage 1	866	0	-	-	-	-	-	-	-
Stage 2	838	0	-	-	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	10	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET	NWLn1	SWT	SWR
Capacity (veh/h)	1322	-	842	-	-
HCM Lane V/C Ratio	0.002	-	0.142	-	-
HCM Control Delay (s)	7.7	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

1: Lake Easton Road & I-90 EB Ramps Performance by movement

Movement	SEL	SET	SER	NET	NER	SWL	SWT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Total Del/Veh (s)	6.0	6.1	2.8	0.1	0.0	2.1	0.8	3.4

2: Lake Easton Road & I-90 WB Ramps Performance by movement

Movement	NWT	NWR	NEL	NET	SWT	SWR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	8.1	3.6	1.6	1.1	2.0	1.2	2.0

3: Lake Easton Road/Site Driveway & W Sparks Road Performance by movement

Movement	SEL	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1
Total Del/Veh (s)	5.6	2.8	5.8	1.9	3.2	0.1	0.2	0.1	6.8	6.9	2.8	2.9

4: W Sparks Road & Site Driveway Performance by movement

Movement	WBR	NBT	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.1
Total Del/Veh (s)	2.8	0.0	1.5	0.2	0.6

Total Network Performance

Denied Del/Veh (s)	0.1
Total Del/Veh (s)	6.4

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	20	55	1	1	60
Future Vol, veh/h	1	20	55	1	1	60
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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	2	100	100	2
Mvmt Flow	1	22	60	1	1	65

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	128	61	0	0	61	0
Stage 1	61	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	7.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	679	786	-	-	1093	-
Stage 1	762	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	678	786	-	-	1093	-
Mov Cap-2 Maneuver	678	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	755	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	780	1093	-
HCM Lane V/C Ratio	-	-	0.029	0.001	-
HCM Control Delay (s)	-	-	9.8	8.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX D
RIGHT TURN LANE WARRANTS

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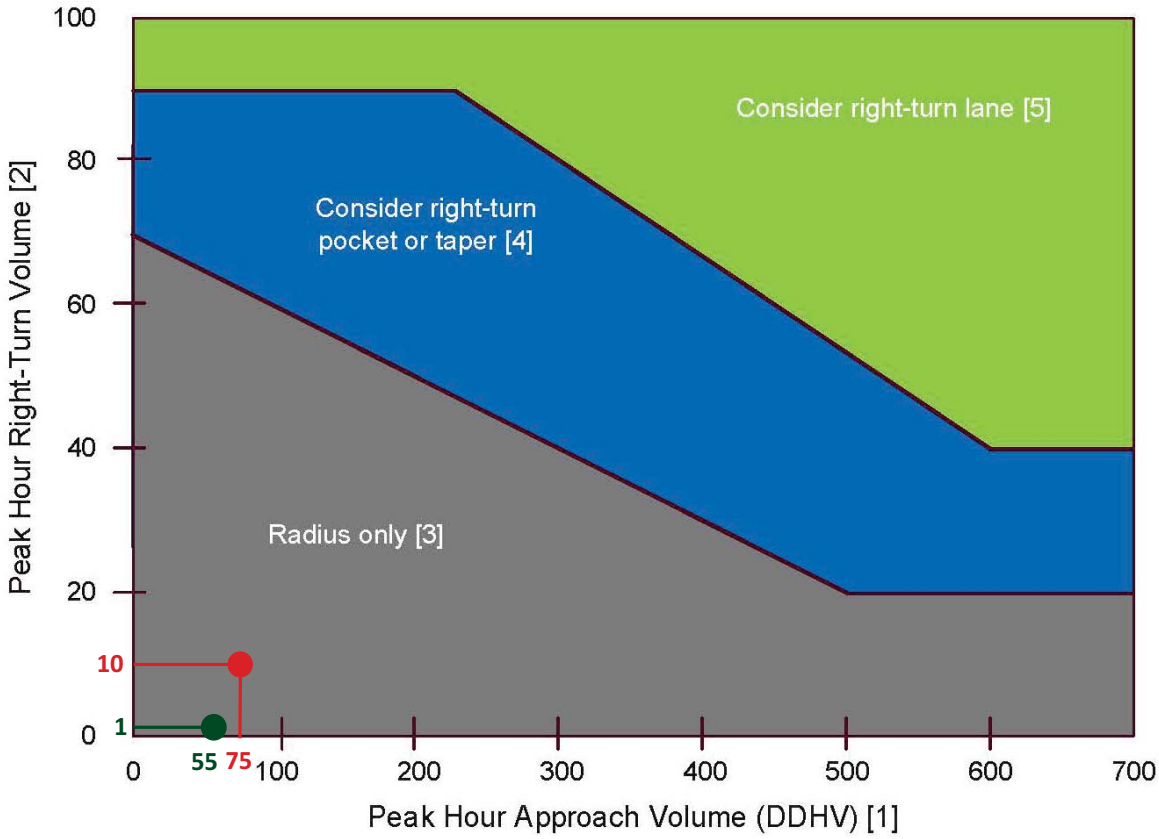
Exhibit 1310-11 Right-Turn Lane Guidelines



Notes:

[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 below
- 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.

LEGEND

W Sparks Road/North Driveway

W Sparks Road/South Driveway

SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

Right Turn Warrant Analysis - W Sparks Road
Site Driveways Projected 2020 PM Peak Hour

Appendix B

Operational Analysis Worksheets

Intersection	
Int Delay, s/veh	5.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	20	5	10	0	0	0	0	15	1	30	10	0
Future Vol, veh/h	20	5	10	0	0	0	0	15	1	30	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	0	0	0	7	7	7	3	3	3
Mvmt Flow	22	6	11	0	0	0	0	17	1	33	11	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	95	95	11	-	0	0	18	0	0
Stage 1	77	77	-	-	-	-	-	-	-
Stage 2	18	18	-	-	-	-	-	-	-
Critical Hdwy	6.43	6.53	6.23	-	-	-	4.13	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.43	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	-	-	-	2.227	-	-
Pot Cap-1 Maneuver	902	793	1067	0	-	-	1592	-	0
Stage 1	943	829	-	0	-	-	-	-	0
Stage 2	1002	878	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	883	0	1067	-	-	-	1592	-	-
Mov Cap-2 Maneuver	883	0	-	-	-	-	-	-	-
Stage 1	943	0	-	-	-	-	-	-	-
Stage 2	981	0	-	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9	0	5.5
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	SELn1	SWL	SWT
Capacity (veh/h)	-	-	937	1592	-
HCM Lane V/C Ratio	-	-	0.042	0.021	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	2	30	2	35	0	0	40	20
Future Vol, veh/h	0	0	0	1	2	30	2	35	0	0	40	20
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, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	4	4	4	3	3	3	2	2	2
Mvmt Flow	0	0	0	1	2	35	2	41	0	0	47	23

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	104	115	41	70	0	-	-	-	0
Stage 1	45	45	-	-	-	-	-	-	-
Stage 2	59	70	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.13	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.227	-	-	-	-	-
Pot Cap-1 Maneuver	889	771	1024	1524	-	0	0	-	-
Stage 1	972	853	-	-	-	0	0	-	-
Stage 2	959	833	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	888	0	1024	1524	-	-	-	-	-
Mov Cap-2 Maneuver	888	0	-	-	-	-	-	-	-
Stage 1	971	0	-	-	-	-	-	-	-
Stage 2	959	0	-	-	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	8.7	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	NWLn1	SWT	SWR
Capacity (veh/h)	1524	-	1019	-	-
HCM Lane V/C Ratio	0.002	-	0.038	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

3: Lake Easton Road & W Sparks Road Performance by movement

Movement	SET	SER	NWL	NWT	NEL	NER	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	7.3	2.2	4.2	7.0	0.2	0.1	2.0

Intersection	
Int Delay, s/veh	7.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	95	5	10	0	0	0	0	35	1	95	30	0
Future Vol, veh/h	95	5	10	0	0	0	0	35	1	95	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	20	3	3	0	0	0	7	7	7	17	3	3
Mvmt Flow	106	6	11	0	0	0	0	39	1	106	33	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	285	285	33	-	0	0	40	0	0
Stage 1	245	245	-	-	-	-	-	-	-
Stage 2	40	40	-	-	-	-	-	-	-
Critical Hdwy	6.6	6.53	6.23	-	-	-	4.27	-	-
Critical Hdwy Stg 1	5.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.6	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4.027	3.327	-	-	-	2.353	-	-
Pot Cap-1 Maneuver	669	623	1038	0	-	-	1478	-	0
Stage 1	755	702	-	0	-	-	-	-	0
Stage 2	938	860	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	620	0	1038	-	-	-	1478	-	-
Mov Cap-2 Maneuver	620	0	-	-	-	-	-	-	-
Stage 1	755	0	-	-	-	-	-	-	-
Stage 2	870	0	-	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	11.9	0	5.8
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	SELn1	SWL	SWT
Capacity (veh/h)	-	-	645	1478	-
HCM Lane V/C Ratio	-	-	0.189	0.071	-
HCM Control Delay (s)	-	-	11.9	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-

Intersection	
Int Delay, s/veh	2.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	2	100	2	130	0	0	125	85
Future Vol, veh/h	0	0	0	1	2	100	2	130	0	0	125	85
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, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	4	4	22	3	17	3	2	10	10
Mvmt Flow	0	0	0	1	2	116	2	151	0	0	145	99

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	350	399	151	244	0	-	-	-	0
Stage 1	155	155	-	-	-	-	-	-	-
Stage 2	195	244	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.42	4.13	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.498	2.227	-	-	-	-	-
Pot Cap-1 Maneuver	643	536	845	1316	-	0	0	-	-
Stage 1	868	766	-	-	-	0	0	-	-
Stage 2	833	700	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	642	0	845	1316	-	-	-	-	-
Mov Cap-2 Maneuver	642	0	-	-	-	-	-	-	-
Stage 1	866	0	-	-	-	-	-	-	-
Stage 2	833	0	-	-	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	10	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET	NWLn1	SWT	SWR
Capacity (veh/h)	1316	-	842	-	-
HCM Lane V/C Ratio	0.002	-	0.142	-	-
HCM Control Delay (s)	7.7	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

3: Lake Easton Road/Site Driveway & W Sparks Road Performance by movement

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
Total Del/Veh (s)	5.2	7.9	2.6	5.6	3.2	4.0	0.6	0.4	0.2	7.3	6.8	3.4

3: Lake Easton Road/Site Driveway & W Sparks Road Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	3.2

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	20	60	1	1	65
Future Vol, veh/h	1	20	60	1	1	65
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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	2	100	100	2
Mvmt Flow	1	22	65	1	1	71

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	139	66	0	0	66	0
Stage 1	66	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	7.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	669	780	-	-	1088	-
Stage 1	757	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	668	780	-	-	1088	-
Mov Cap-2 Maneuver	668	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	774	1088	-
HCM Lane V/C Ratio	-	-	0.029	0.001	-
HCM Control Delay (s)	-	-	9.8	8.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-