

# Traffic Impact Analysis

Woodland Community Library  
828 Goerig Street  
Woodland, Washington 98674

Prepared for:  
Fort Vancouver Regional Library District  
1007 E Mill Plain Boulevard  
Vancouver, Washington 98663

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PBS Project 71252.000



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## **1 EXECUTIVE SUMMARY**

### **1.1 Purpose and Scope**

Fort Vancouver Regional Library District (FVRLD, the applicant) has submitted a site plan for the Woodland Community Library project. The site, which covers 1.71 acres, is located at 828 Goerig Street in Woodland, Washington. The applicant proposes to construct a single building with 10,000 square feet of gross floor area. The proposed building and additional site improvements are located on one parcel at the southeast corner of the Goerig Street, Lakeshore Drive, and Buckeye Street intersection. The site is near the congested interchange of I-5 and Lewis River Road/SR 503.

The anticipated build-out year of the project is 2025. This report analyzes the traffic impacts generated by the proposed library as required by the City of Woodland (City) and Washington State Department of Transportation (WSDOT) following consultation with City and WSDOT staff.

### **1.2 Findings**

Traffic volumes in the study area are expected to increase with or without the project. A 1 percent annual compounded growth rate was applied in both the short-term (2025) and long-term (2045) analysis for all studied intersections.

The project proposes two access points: a one-way lane that services the book drop from Goerig Street that directs vehicles to the parking lot and the parking lot access from Lakeshore Drive. There are no proposed turn pockets or turning restrictions regarding the access points.

The proposed Woodland Community Library development is estimated to generate 540 trips on a typical weekday, including 11 trips during the AM peak hour and 71 trips during the PM peak hour.

For traffic impact fee (TIF) calculations, a PM peak hour volume of 60 vehicle trips should be used based on the replacement of the existing library.

The Goerig Street, Lakeshore Drive, and Buckeye Street intersection currently operates at levels of service (LOS) E for the Buckeye Street approach with 46 seconds of delay in the PM peak hour. All other studied intersections currently operate at LOS of D or better in the AM and PM peak hours.

In 2025, with and without the project, the Goerig Street, Lakeshore Drive, and Buckeye Street intersection operates at levels of service LOS F in the AM and PM peak hours for the Buckeye Street approach. All other studied intersections operate at LOS of D or better in the AM and PM peak hours.

Mitigation at the Goerig Street/Lakeshore Drive/Buckeye Street intersection was addressed in an intersection control evaluation report dated December 19, 2018. A traffic signal with left-turn lanes on Goerig Street and a right-turn lane on Lakeshore Drive, will have a LOS B for 2045 with or without the project.

In 2045 PM peak, the I-5 northbound (NB) off-ramp/Atlantic Street/Lewis River Road intersection and the CC Street/Lewis River Road intersection both operate at LOS E with or without the project. It is assumed that the project to modify the I-5/SR 503, will improve the operation of these intersections to LOS D or better.

No right- or left-turn lanes are needed at site driveways.

Several intersections have and are projected to have queues exceeding the storage capacity of the lanes. The library project will add very little additional queues to these intersections. The I-5/SR 503 interchange project should address these long queues.

The 2013 to 2017 collision history at the study intersections was reviewed and the collision rate calculated. For all intersections the collision rate was below the critical rate. No further analysis of an intersections was prepared.

At the project's completion, public sidewalks will extend along both site frontages (Goerig Street and Lakeshore Drive) which will serve the pedestrian traffic between the project site and the surrounding neighborhoods and commercial activities. Bicycle activity to and from the site is anticipated to be moderate. There are no existing bike lanes along Goerig Street and Buckeye Street/Lakeshore Drive or within the project vicinity.

No physical features should significantly limit sight distance at the driveway exiting the site onto Lakeshore Drive.

### **1.3 Recommendations**

The traffic impact analysis (TIA) supports the following recommendations:

- The library project should contribute a proportionate share to a project that installs a traffic signal with left-turn lanes on Goerig Street and a right-turn lane on Lakeshore Drive.
- Assure all sidewalks, curb ramps, and the driveways constructed with the project are ADA compliant.
- With improvements to the Goerig Street/Lakeshore Drive/Buckeye Street intersection, the bike lanes should be included on both Goerig Street and Lakeshore Drive.
- Design the proposed driveway access points consistent with AASHTO sight distance guidelines. The Lakeshore Drive driveway for the project should be aligned with the park and ride driveway on the north side of Lakeshore.
- Do not install objects within the sight distance triangles that would block drivers' view when exiting the site at either of the access points.

## 2 INTRODUCTION

The purpose of this study is to determine the impacts of traffic generated by the Woodland Community Library project. The project site, shown on the vicinity map (Figure 1), is directly southeast of the Goerig Street, Lakeshore Drive, and Buckeye Street intersection. This study will determine whether mitigation is required to keep the roadways operating safely and at capacity levels acceptable under the current level of service standards. Particularly, the Goerig Street, Lakeshore Drive, and Buckeye Street intersection will be evaluated for the need of additional traffic control. This report documents the findings and conclusions of a traffic impact analysis (TIA) conducted for the proposed site plan (Figure 2) application for property located in the City of Woodland, Washington (City).

### 2.1 Scope of Work

This study documents existing and proposed conditions, traffic data, safety analysis, and intersection operations in accordance with City requirements.

The scope of this TIA was refined in phone conversations and email correspondence with City staff. The following intersections were identified for analysis:

- Goerig Street, Lakeshore Drive, and Buckeye Street (Intersection 1)
- Goerig Street, Lewis River Road, and existing driveways (Intersection 2)
- Lewis River Road, Pacific Avenue, and I-5 southbound (SB) on-ramp (Intersection 3)
- Atlantic Avenue, I-5 northbound (NB) off-ramp, and Lewis River Road (Intersection 4)
- E CC Street and Lewis River Road (Intersection 5)

In addition, trip assignments and limited discussion are provided at the following intersections:

- Lakeshore Drive and the park and ride driveway (Intersection 6)
- The site driveway on Lakeshore Drive, assumed across from the existing parking and ride driveway.

This TIA is prepared for submission to the City. The following traffic-related issues addressed in this report are consistent with discussions with City staff:

- Existing traffic conditions, including background growth and in-process trips
- Trip generation, distribution, and assignment to driveways and intersections.
- Level of service (LOS) for the intersections for opening year 2025 and for a 20-year forecast (2045).
- Collision history evaluation of the intersections.
- Sight distance triangle evaluation of proposed driveways.
- Right-turn lane evaluation at site entrances per Washington State Department of Transportation (WSDOT) *Design Manual*.
- Queuing analysis at the intersections.
- Pedestrian and bicycle access evaluation.

### 2.2 Existing Conditions

The existing infrastructure and operational traffic conditions in the study area were documented. Roadway conditions were studied to confirm that the roadway is currently operating in a safe and efficient manner. The study area and the impacted intersections are shown on Figure 1.

### 2.3 Existing Infrastructure

Characteristics of the private properties and public rights-of-way surrounding the project site were compiled to inform this analysis. The surrounding facilities may experience traffic impacts due to the project development, so it is important to inventory their existing conditions.

#### 2.3.1 Land Uses

Land uses surrounding the site are documented to help identify the site location and provide context for any discussion of conditions that might impact adjacent properties. The land uses surrounding the site are shown in Table 1.

**Table 1. Land Uses Around the Site**

Northwest of Site		Northeast of Site	
<b>Zoning</b>	C-3	<b>Zoning</b>	C-2
<b>Description</b>	Neighborhood Commercial	<b>Description</b>	Highway Commercial
<b>Existing Use</b>	Multi-Unit Residence	<b>Existing Use</b>	Park & Ride

West of Site		East of Site	
<b>Zoning</b>	C-3	<b>Zoning</b>	C-2
<b>Description</b>	Neighborhood Commercial	<b>Description</b>	Highway Commercial
<b>Existing Use</b>	Private Residence	<b>Existing Use</b>	Undeveloped Land

Southwest of Site		Southeast of Site	
<b>Zoning</b>	C-3	<b>Zoning</b>	C-2
<b>Description</b>	Neighborhood Commercial	<b>Description</b>	Highway Commercial
<b>Existing Use</b>	Private Residence	<b>Existing Use</b>	Undeveloped Land

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The site is zoned Highway Commercial (C-2) and is currently used for commercial activities, specifically, a funeral home.

#### 2.3.2 Existing Roadways

The site has frontage on the existing urban major collector Goerig Street and urban major collector Lakeshore Drive. Data was gathered on these roadways in the study area for an operations analysis of the existing roadway system. The pertinent information regarding the study area roadways is tabulated in Table 2.

**Table 2. Existing Roadway Information**

Roadway Name	Classification	Speed Limit	Lane Configuration		
			Travel Lanes	Sidewalks	Bike Lanes
Goerig Street	Urban Major Collector	25 mph	2	Yes	No
Lakeshore Drive/Buckeye Street	Urban Major Collector	25 mph	2	Partial	No

### 2.3.3 Major Intersections and Traffic Control

Operations and safety at the study area roadways' intersections are evaluated in this TIA. Table 3 presents the existing geometrics and traffic control at the study intersections. The analysis assumes Goerig Street-Lewis River Road corridor is east-west and the cross streets are north-south.

**Table 3. Intersection, Driveway, and Traffic Controls**

Intersection	Goerig St/Lakeshore Dr/Buckeye St (1)			
Leg	NB	SB	WB	EB
Control	Stop.	Stop	Unc.	Unc.
Number of Lanes	1	1	1	1

Intersection	Goerig St/N Driveway/S Driveway (2)		
Leg	SB	N Driveway	S Driveway
Control	Stop	Stop	Stop
Number of Lanes	1	1	1

Intersection	Lewis River Rd/Pacific Ave/Goerig St (3)			
Leg	NB	SB	WB	EB
Control	Signal	Signal	Signal	Signal
Number of Lanes	0	2	3	3

Intersection	Atlantic Ave/I-5 NB/Lewis River Rd (4)			
Leg	NB	SB	WB	EB
Control	Signal	Signal	Signal	Signal
Number of Lanes	2	2	2	3

Intersection	E CC St/Lewis River Rd (5)		
Leg	NB	WB	EB
Control	Signal	Signal	Signal
Number of Lanes	2	3	2

Intersection	Lakeshore Dr/Park and Ride Driveway/Site driveway (6)		
Leg	SB (Driveway)	WB	EB
Control	Stop	Unc.	Unc.
Number of Lanes	1	1	1

Signal = Signalized Intersection  
 Stop = Stop controlled leg of intersection  
 Unc. = Uncontrolled leg approaching intersection—does not stop or yield

The project area is defined as the vicinity of the site encompassed by the studied intersections. Intersection operations can be controlled by signing, roundabouts, or signals. Table 3 refers to the types of traffic control and the number of approach lanes for each leg of each intersection. The existing lane configurations and traffic controls for all intersections are shown in Figure 3.



In the level of service analysis in Synchro software, the Lewis River Road-Goerig Street corridor was assumed to be east-west and the cross streets are north-south.

## **2.4 Traffic Volumes**

Existing traffic volume data are the basis for analyzing the capacity and safety of the roadway. Background traffic growth was estimated for the build-out year of 2025 and for the forecast year of 2045.

### **2.4.1 Existing Traffic**

On May 23, 2018, traffic data was collected at the studied intersections and site access driveways. PBS retained All Traffic Data Services, Inc., to gather the count data at the following intersections for the weekday morning peak hour (7:00 to 9:30 am) and weekday evening peak hour (3:00 to 6:00 pm).

1. Goerig Street/Lakeshore Drive/Buckeye Street
2. Goerig Street/N Driveway/S Driveway
3. Lewis River Road/Pacific Avenue/Goerig Street
4. Atlantic Avenue/I-5 NB/Lewis River Road
5. E CC Street/Lewis River Road
6. Lakeshore Drive/Park and Ride Driveway/Site driveway

The existing peak hour volumes for the studied intersections are shown in Figure 4. Copies of the count data utilized are provided in Appendix A.

### **2.4.2 Background Traffic**

To account for general growth in traffic volumes over time, the counts gathered were increased by the 1 percent background growth factor for 7 years to estimate 2025 buildout conditions and 27 years for the 2045 forecast year.

### **2.4.3 In-Process Traffic**

In-process projects are approved developments whose trips are vested but that have not yet been fully occupied. These trips are added to the studied intersections and are shown in Figures 6–9. The in-process projects relevant to the study area are:

- YMCA (southwest of the site at the Park Road and Lakeshore Drive intersection)
- Columbia River Carbonates (northwest of the site at the Caples Road and N Pekin Road intersection)
- Dutch Bros Coffee Shop (north of the site at the Beechwood Street and Pacific Avenue intersection)
- RV Sales and Repair Shop (north of the site just south of the E Scott Avenue and Atlantic Avenue intersection)

All projects are expected to be completed by 2025. Trips generated by the in-process projects were distributed through the project area based on regional land development patterns, existing traffic volumes, and engineering judgment. Trip generation calculations are included in Appendix B.

### 3 PROPOSED CONDITIONS

The proposed development will add traffic to the roadway system. Project location, size, and time of completion are all important elements that need to be considered to determine the impacts of this development on traffic safety and capacity. It is also important to examine how the project will operate with the existing transportation system, estimate how much new traffic it will generate, and predict where traffic generated by the site will be distributed. In addition to these elements, this section also addresses any funded infrastructure changes planned by agencies or other developers. All these elements are important in assessing the traffic impacts of this project.

#### 3.1 Project Description

This proposal will redevelop a majority of the 1.71-acre site to construct a new Woodland Community Library and parking lot. Currently, the Woodland Chamber of Commerce operates a Tourist Information Center (Info Center) on WSDOT right-of-way on the northeast corner of the Goerig/Lakeshore/Buckeye intersection, adjacent to the park and ride transit facility. With this project, the goal is to relocate the Info Center to the library site as a separate facility. The development is scheduled for completion in 2025. This report analyzes the traffic impacts generated by the completed development as required by the City and following consultation with City staff.

The preliminary lot configuration and site development pattern are shown on Figure 2.

The proposed development will consist of a 10,000 square foot building occupied by the Woodland Community Library and the Woodland Tourist Information Center.

#### 3.2 Access

Properly configured access points are essential to allow for the safe and orderly movement of traffic in and out of a site. Site access is important to the success of the proposed library. The community, in general, will value convenient access into the library parking lot.

The project site has two existing access points. The existing driveway to the site on Lakeshore Drive is currently configured to allow full access, no driveway restrictions. The existing driveway to the site on Goerig Street is also currently configured to allow full access. There are no existing turn lanes for right- or left-turns at the site driveway.

A site plan provided by the client shows two proposed access points; a one-way lane that services the book drop from Goerig Street that directs vehicles to the parking lot and the parking lot access from Lakeshore Drive. There are no proposed turn pockets or turning restrictions regarding the access points. See Figure 2 for more details

#### 3.3 Trip Generation and Distribution

##### 3.3.1 Trip Generation

The Institute of Transportation Engineers' (ITE) *Trip Generation Manual* (see References) was used to develop the trip generation estimates for the Woodland Community Library. Based off the proposed site plan, Library (land use code 590) was used to determine the trip generation for the library. In addition to the library, the Info Center is assumed to be relocated to the library site as a separate facility. The size of the replacement visitor center is assumed to be the same and the trips only impact the Lakeshore Drive site drive. No new trips will be added to the off-site intersections. A discussion with Info Center staff and verified with the turning movement volumes for the driveway to provide the number of peak trips the info center generates as there is

no land use for information center in the ITE *Trip Generation Manual*. The total new trips generated by the project are summarized in Table 4.

**Table 4. ITE Trip Generation Summary**

<b>Land Uses</b>	590		
<b>Independent Value</b>	10,000 Square Feet		
	<b>In</b>	<b>Out</b>	<b>Total</b>
<b>Average Weekday</b>	269	270	540
<b>AM Peak Hour</b>	8	3	11
<b>PM Peak Hours</b>	34	37	71

No pass-by rates were applied when calculating new trips developed by the site. No reduction was made for the existing funeral home on the site because it was not in operation when the traffic counts were taken.

For traffic impact fee (TIF) calculations, a reduction in the PM peak hour trips is recommended based on replacement of the existing Woodland Community Library on Park Street. The size of the existing library is estimated at 1,500 square feet and a PM trip generation of 11 trips. Thus, the TIF should be estimated based on  $71 - 11 = 60$  PM peak hour trips.

### 3.3.2 Trip Distribution

A trip distribution pattern was estimated based on regional land development patterns, existing traffic volumes, and engineering judgment. Site-generated trips were estimated to distribute as follows:

- 30 percent to or from the northeast on Lewis River Road (SR-503)
- 15 percent to or from the east on E CC Street
- 5 percent to or from the south on I-5
- 5 percent to or from the north on I-5
- 5 percent to or from the north on Atlantic Avenue
- 15 percent to or from the north on Pacific Avenue
- 5 percent to or from the southeast on Lakeshore Drive
- 15 percent to or from the southwest on Goerig Street
- 5 percent to or from the northwest on Buckeye Street

The project trips and their distribution within the study area are shown on Figure 5.

## 3.4 Proposed Infrastructure

### 3.4.1 Roadway Frontage

It is anticipated that frontage improvements will occur with project. The client envisions the library as both a regional facility and a local destination that will provide an attractive entrance to the City of Woodland’s downtown. Decorative streetscaping, enhanced pedestrian and bicycle facilities, or a roundabout are all possibilities for enhancing the property.

Currently there is existing sidewalk along Goerig Street and no sidewalk along Lakeshore Drive. Sidewalk will be required along Lakeshore Drive south to the extents of the project. Where new sidewalk is conditioned with the project, the sidewalk and driveways shall be constructed to meet current ADA standards.

### **3.4.2 Planned Capital Projects**

Per the City of Woodland's Transportation Plan and Six-year Transportation Plan, the I-5/SR 503 interchange is partially funded that may include the improvements from Lakeshore-Buckeye to Millard Street. Once completed, this project is projected to improve congestion and safety near the I-5/SR 503 interchange, as well as improve bicycle and pedestrian connectivity within the project study area.

## **4 INTERSECTION OPERATIONS ANALYSIS**

### **4.1 Description**

Traffic operations are assessed in terms of LOS. LOS is a concept that was developed by transportation engineers to quantify the level of operation of intersections and roadways (Highway Capacity Manual, Reference 1). LOS measures are classified in grades "A" through "F" indicating a range of operation. LOS "A" signifies the best level of operation, while "F" represents the worst. At LOS "F," a signalized intersection is considered to have failed. For signalized intersections LOS is primarily measured in terms of average delay for the entire intersection. Volume to capacity ratio (v/c) is used as an additional measure for quantifying the capacity utilization/design adequacy of the intersection.

LOS at signalized intersections is defined in terms of average control delay for all entering vehicles. LOS A represents minor delay (less than 10 seconds), and LOS F represents long delay (over 80 seconds). LOS at unsignalized intersections and commercial driveways is defined in terms of control delay; however, the methodology only presents LOS for the minor movements of the intersection. LOS A represents minor delay (less than 10 seconds), while LOS F represents long delay (over 50 seconds). The criteria are based on the theory of gap acceptance for side street stop-controlled approaches.

### **4.2 Operation Standards**

The study area of Woodland is within Cowlitz County which has exercised the ability to opt-out of full Growth Management Act planning. Thus, no concurrency regulations apply to the studied intersections. The City of Woodland has not adopted level of service standards; for this analysis, WSDOT level of service standards will be applied. WSDOT considers LOS "D" at signalized intersections and LOS "E" at unsignalized intersections the minimum acceptable operations.

### **4.3 Analysis Methodology**

Traffic impacts were estimated to determine the extent of change in traffic conditions caused by the development of this project. The following assumptions were used to make this determination:

- Existing conditions were analyzed without adjustments or modifications to the volumes.
- The proposed development will be completed and fully occupied in 2025.
- Existing background traffic will grow by a 1 percent annual compound rate for all studied intersections.
- Background traffic volumes on the surrounding street system have been determined prior to adding the traffic volumes of the proposed project. This was done to establish a baseline for measurement of the project impacts at the time of its development. Background traffic volume estimates were prepared for the 2025 build-out year and 2045 forecast year.
- Trip generation estimates for the project were prepared for the weekday AM and PM peak hour and assigned to the surrounding street system.
- Cumulative traffic impacts of the proposed project were determined by superimposing the project-generated traffic onto the background weekday AM and PM peak traffic.

- The LOS for all intersections was calculated with Trafficware’s Synchro, Version 9, software based on Highway Capacity Manual’s (HCM) 2000 methodologies due to close spacing of signalized intersections. SimTraffic was used to calculate the queue lengths.
- A peak hour factor of 0.92 was used for all intersections based on the traffic count data and engineering judgement. A heavy vehicle percentage of 5 percent for the AM peak hour and 3 percent for the PM peak hour was used based on the existing traffic counts and engineering judgement.

The traffic volumes for the 2025 and 2045, both without and with the project, are tabulated in Figures 6–9, respectively. LOS calculation reports, which include the detailed v/c ratios and LOS results for each intersection lane group, are provided in Appendix C. The key analysis findings are listed in the following tables.

#### 4.4 Level of Service Analyses

The LOS was calculated for existing and future condition with and without the proposed library. The library is assumed to be complete in 2025. The 2045 horizon year was used for possible mitigation.

##### 4.4.1 2018 Existing Conditions

**Table 5. Estimated 2018 AM Existing Levels of Service for Study Area Intersections**

INTERSECTION	2018 Existing Level of Service		
	AM Peak Hour		
	LOS	Delay (sec)	V/C
Goerig St/Lakeshore Dr/Buckeye St	D	32.5	0.36
Goerig St/N Driveway/S Driveway	B	13	0.20
Lewis River Rd/Pacific Ave/ Goerig St	B	12.6	0.57
Atlantic Ave/I-5 NB/Lewis River Rd	C	27.8	0.55
E CC St/Lewis River Rd	C	31.4	0.50
Lakeshore/Park & Ride Driveway	A	8.8	0.01

As shown in Table 5, the studied intersections currently operate at an acceptable level of service.

**Table 6. Estimated 2018 PM Existing Levels of Service for Study Area Intersections**

INTERSECTION	2018 Existing Level of Service		
	PM Peak Hour		
	LOS	Delay (sec)	V/C
Goerig St/Lakeshore Dr/Buckeye St	E	46.2	0.38
Goerig St/N Driveway/S Driveway	B	11.9	0.16
Lewis River Rd/Pacific Ave/ Goerig St	C	25.9	0.68
Atlantic Ave/I-5 NB/Lewis River Rd	D	39	0.67
E CC St/Lewis River Rd	D	35.3	0.76
Lakeshore/Park & Ride Driveway	A	9.7	0.04

As shown in Table 6, the studied intersections currently operate at an acceptable level of service.

**4.4.2 2025 Year of Opening Conditions**

**Table 7. Estimated 2025 AM Levels of Service for Study Area Intersections**

INTERSECTION	2025 Level of Service					
	Without Project			With Project		
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
Goerig St/Lakeshore Dr/Buckeye St	F	79.8	0.68	F	83.9	0.70
Goerig St/N Driveway/S Driveway	B	14.4	0.24	B	14.5	0.25
Lewis River Rd/Pacific Ave/ Goerig St	B	14.4	0.64	B	14.5	0.65
Atlantic Ave/I-5 NB/Lewis River Rd	C	32.6	0.63	C	32.6	0.63
E CC St/Lewis River Rd	D	37.4	0.53	D	37.6	0.53
Lakeshore/Park & Ride Driveway	A	8.8	0.01	A	8.8	0.01

The Goerig Street/Lakeshore Drive/Buckeye Street intersection will reach LOS F in 2025 AM peak hour with or without the library project.

**Table 8. Estimated 2025 PM Levels of Service for Study Area Intersections**

INTERSECTION	2025 Level of Service					
	Without Project			With Project		
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
Goerig St/Lakeshore Dr/Buckeye St	F	169.3	0.88	F	290.4	1.16
Goerig St/N Driveway/S Driveway	B	12.7	0.18	B	13.2	0.20
Lewis River Rd/Pacific Ave/ Goerig St	C	30.9	0.80	C	33.3	0.80
Atlantic Ave/I-5 NB/Lewis River Rd	D	45.8	0.78	D	46.6	0.78
E CC St/Lewis River Rd	D	41.8	0.82	D	43.2	0.84
Lakeshore/Park & Ride Driveway	A	9.8	0.05	B	10	0.04

The Goerig Street/Lakeshore Drive/Buckeye Street intersection will reach LOS F in 2025 PM peak hour with or without the library project.

### 4.4.3 2045 Conditions

**Table 9. Estimated 2045 AM Levels of Service for Study Area Intersections**

INTERSECTION	2045 Level of Service					
	Without Project			With Project		
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
Goerig St/Lakeshore Dr/Buckeye St	F	324.4	1.36	F	351.3	1.42
Goerig St/Lewis River Rd	C	17.7	0.35	C	17.9	0.36
Pacific Ave/I-5 SB/Lewis River Rd	B	18.5	0.75	B	18.6	0.75
Atlantic Ave/I-5 NB/Lewis River Rd	D	39.2	0.70	D	45	0.78
E CC St/Lewis River Rd	D	44	0.63	D	49.7	0.64
Lakeshore Dr/Park & Ride Driveway	A	8.9	0.02	A	8.9	0.02

The Goerig Street/Lakeshore Drive/Buckeye Street intersection will reach LOS F in 2045 AM peak hour with or without the library project.

**Table 10. Estimated 2045 PM Levels of Service for Study Area Intersections**

INTERSECTION	2045 Level of Service					
	Without Project			With Project		
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
Goerig St/Lakeshore Dr/Buckeye St	F	933.5	2.45	F	1604.7	3.73
Goerig St/Lewis River Rd	B	14.7	0.26	C	15.3	0.28
Pacific Ave/I-5 SB/Lewis River Rd	D	39.4	0.89	D	39.8	0.90
Atlantic Ave/I-5 NB/Lewis River Rd	E	76.5	0.95	E	76.7	0.95
E CC St/Lewis River Rd	E	58.9	1.00	E	60.5	1.02
Lakeshore Dr/Park & Ride Driveway	B	10.2	0.06	B	10.4	0.05

In the 2045 PM peak, the I-5 NB off-ramp/Atlantic Street/Lewis River Road intersection and the CC Street/Lewis River Road intersection both operate at LOS E with or without the project. It is assumed the project to modify the I-5/SR 503, will improve the operation of these intersection to LOS D or better.

The Goerig Street/Lakeshore Drive/Buckeye Street intersection will reach LOS F in 2045 PM peak hour with or without the library project.

Mitigation at the Goerig Street/Lakeshore Drive/Buckeye Street intersection was addressed in an intersection control evaluation report dated December 19, 2018. With a traffic signal, left-turn lanes on Goerig Street and a right-turn lane on Lakeshore Drive, the LOS is B for 2045 with or without the project.

### 4.5 Queue Analysis

In addition to the LOS analyses, estimates of vehicle queues are provided for all analysis scenarios to indicate the potential impact of the development on intersection queues and the frequency with which queues may spill back to or beyond left-turn pockets and proposed or existing driveways.

Queue estimates were made using Trafficware's SimTraffic, Version 9, software, due to the closely spaced intersections on the Lewis River Road-Goerig Street corridor. The results, which are rounded to the nearest 25

feet to represent the average headway between queued vehicles, are presented in Table 11. Queues are reported using the 95th percentile queue as an estimate suggesting the queue length, where 95 percent of the queues are the stated length or shorter. These values reflect a statistical estimate, not necessarily observed queues, based on model results.

The detailed SimTraffic queue reports are provided in Appendix D.

**Table 11. AM Estimated Queues for Study Area Intersections**

INTERSECTION	Approach Lane	Storage Capacity	2018 AM Queues	2025 AM Queues	
			Existing Queues	Without Project	With Project
Goerig St/Lakeshore Dr/Buckeye St	EB LTR		30	45	41
	WB LTR		73	122	118
	NB LTR		54	75	71
	SB LTR		63	85	75
Goerig St/Lewis River Rd	EB T		3	5	0
	WB T		4	18	13
	SB R		69	83	84
Pacific Ave/I-5 SB/Lewis River Rd	EB L	105	58	76	75
	EB T		124	157	153
	EB TR	105	<b>116</b>	<b>133</b>	<b>139</b>
	WB L	115	<b>184</b>	<b>222</b>	<b>217</b>
	WB T		219	308	282
	WB R		18	60	75
	SB L	100	<b>113</b>	<b>140</b>	<b>137</b>
	SB TR		122	173	154
Atlantic Ave/I-5 NB/Lewis River Rd	EB L	130	<b>130</b>	<b>169</b>	<b>178</b>
	EB T		100	143	160
	WB T		23	37	34
	WB TR		13	16	15
	NB LT		251	335	314
	NB R	150	79	130	88
	SB L	55	30	34	36
	SB R		76	79	80
E CC St/Lewis River Rd	EB T		11	12	11
	EB TR		63	70	70
	WB L	85	<b>89</b>	<b>125</b>	<b>115</b>
	WB T		256	425	395
	WB T	270	205	<b>296</b>	<b>301</b>
	NB L		270	325	355



INTERSECTION	Approach Lane	Storage Capacity	2018 AM Queues	2025 AM Queues	
			Existing Queues	Without Project	With Project
	NB R	110	<b>111</b>	<b>178</b>	<b>184</b>
Lakeshore Dr/Park & Ride Driveway	EB LTR		15	12	8
	NB LTR		-	-	19
	SB LTR		32	32	36

EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound. L = Left Turn, T = Through Movement, R = Right Turn

**Table 12. PM Estimated Queues for Study Area Intersections**

INTERSECTION	Approach Lane	Storage Capacity	2018 PM Queues	2025 PM Queues	
			Existing Queues	Without Project	With Project
Goerig St/Lakeshore Dr/Buckeye St	EB LTR		39	106	106
	WB LTR		115	171	190
	NB LTR		87	213	241
	SB LTR		60	84	106
Goerig St/Lewis River Rd	EB T		83	155	162
	WB T		35	82	130
	SB R		70	84	101
Pacific Ave/I-5 SB/Lewis River Rd	EB L	105	105	<b>154</b>	<b>155</b>
	EB T		267	308	303
	EB TR	105	<b>207</b>	<b>218</b>	<b>219</b>
	WB L	115	<b>249</b>	<b>286</b>	<b>293</b>
	WB T		384	479	517
	WB R		96	177	266
	SB L	100	<b>191</b>	<b>188</b>	<b>186</b>
Atlantic Ave/I-5 NB/Lewis River Rd	SB TR		497	657	773
	EB L	<b>130</b>	<b>223</b>	<b>240</b>	<b>245</b>
	EB T		271	280	290
	WB T		49	70	79
	WB TR		21	31	38
	NB LT		469	1391	1358
	NB R	<b>150</b>	<b>619</b>	<b>1429</b>	<b>1362</b>
	SB L	<b>55</b>	<b>53</b>	<b>76</b>	<b>75</b>
E CC St/Lewis River Rd	SB R		100	175	186
	EB T		32	29	29
	EB TR		85	85	85
	WB L	85	215	249	274

INTERSECTION	Approach Lane	Storage Capacity	2018 PM Queues	2025 PM Queues	
			Existing Queues	Without Project	With Project
	WB T		351	605	804
	WB T	<b>270</b>	<b>268</b>	<b>336</b>	<b>397</b>
	NB L		<b>860</b>	<b>1563</b>	<b>1428</b>
	NB R	<b>110</b>	<b>302</b>	<b>332</b>	<b>334</b>
Lakeshore Dr/Park & Ride Driveway	EB LTR		23	41	29
	WB LTR		-	-	28
	NB LTR		-	29	76
	SB LTR		47	55	50

EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound. LT = Left Turn, TH = Through Movement, RT = Right Turn

As shown in Table 11 and 12, the existing and 2025 queue lengths exceed storage capacity at various locations. The planned improvement project on the I-5/SR 503 interchange is intended to address the long existing and future queues. The Library project has very little impact on the existing and future queue lengths.

## 5 SAFETY ANALYSIS

### 5.1 Right-Turn Storage Analysis

The criteria for the analysis of right-turn lanes at uncontrolled intersection legs are based on the WSDOT *Design Manual*, Right-Turn Lane Guidelines (Exhibit 1310-11), which notes:

Right-turn movements influence intersection capacity even though there is not conflict between right-turning vehicles and opposing traffic. Right-turn lanes might be needed to maintain efficient intersection operation. Use the following to determine when to consider right-turn lanes at unsignalized intersections:

- For two-lane roadways and for multilane roadways with a posted speed of 45 mph or above, when recommended by Exhibit 1310-11.

The speeds of all uncontrolled roadways at study area intersections are 25 mph and below. With all study roadway speed limits set below the 45-mph threshold noted in the WSDOT *Design Manual* Right-Turn Lane Guidelines, no right-turn lane analyses are recommended for this project.

### 5.2 Left-Turn Storage Analysis

The criteria for the analysis of left-turn lanes at uncontrolled intersection legs are based on the WSDOT *Design Manual*, Exhibit 1310-7a, Left-Turn Storage Guidelines: Two-Lane, Unsignalized. The exhibit provides guideline curves for posted speeds of 40, 50, and 60 mph. By interpolation for the 25-mph posted speed on Goerig Street and Lakeshore Drive, volumes at the Goerig Street/Lakeshore Drive/Buckeye Street intersections do not rise to a level at which further left-turn storage analysis is recommended.

To address the LOS F at the Goerig Street/Lakeshore Drive/Buckeye Street intersection, adding left-turns to each approach was analyzed as mitigation. Left-turn lanes improved the LOS but remains below acceptable standards. If a traffic signal is installed, left-turn lanes should be included on Goerig Street at a minimum. The preferred alternative is addressed in the intersection control evaluation that included several intersection improvements.

### 5.3 Collision Analysis

Collision data from the study area was obtained from WSDOT for the five-year period spanning from January 2013 through December 2017. This analysis assumes that a collision rate less than the critical collision rate for the intersection is typically considered to be within acceptable parameters. A collision rate above the critical rate is worthy of further examination. The detailed collision data can be found in Appendix E. The results of the collision analysis are shown in Table 15.

**Table 15. Collision Analysis for Study Area Intersections (January 2013 through December 2017)**

<b>COLLISION TYPE</b>	<b>Goerig St/ Lakeshore Dr/ Buckeye St</b>	<b>Goerig St/ Lewis River Rd</b>	<b>Pacific Ave/ I-5 SB/ Lewis River Rd</b>	<b>Atlantic Ave/ I-5 NB/ Lewis River Rd</b>	<b>E CC St/ Lewis River Rd</b>	<b>Lakeshore/ Park &amp; Ride Driveway</b>
Angle	3	0	4	3	0	0
Rear-End	2	2	8	5	5	0
Head on	2	0	13	5	0	0
Sideswipe	0	0	0	2	1	0
Fixed Object	1	0	0	0	0	0
Vehicle Overturned	0	0	0	0	0	0
<b>TOTAL COLLISIONS</b>	<b>8</b>	<b>2</b>	<b>25</b>	<b>15</b>	<b>6</b>	<b>0</b>
<b>CRITICAL RATE</b>	<b>0.85</b>	<b>1.26</b>	<b>0.79</b>	<b>0.78</b>	<b>0.80</b>	<b>1.03</b>
<b>COLLISION RATE</b>	<b>0.38</b>	<b>1.03</b>	<b>0.63</b>	<b>0.34</b>	<b>0.17</b>	<b>0.00</b>

To calculate the collision rate, the 2017 existing turning movement counts for the PM peak hour were summed for each approach and multiplied by 10 to provide an approximation of the average daily trips (ADT). The calculation of the critical rate and collision rate are in Appendix E.

The collision history at the study area intersections shows no collision rate higher than the critical rate, and there were no severe or fatal injury types. No further review is recommended.

### 5.4 Transit, Pedestrian, and Bicycle Facilities

KWRL Transportation provides school bus service to the Kalama-Woodland-Ridgefield-La Center area. The nearest bus stop lies approximately 0.2 mile to the west of the project site adjacent to the Woodland Middle School.

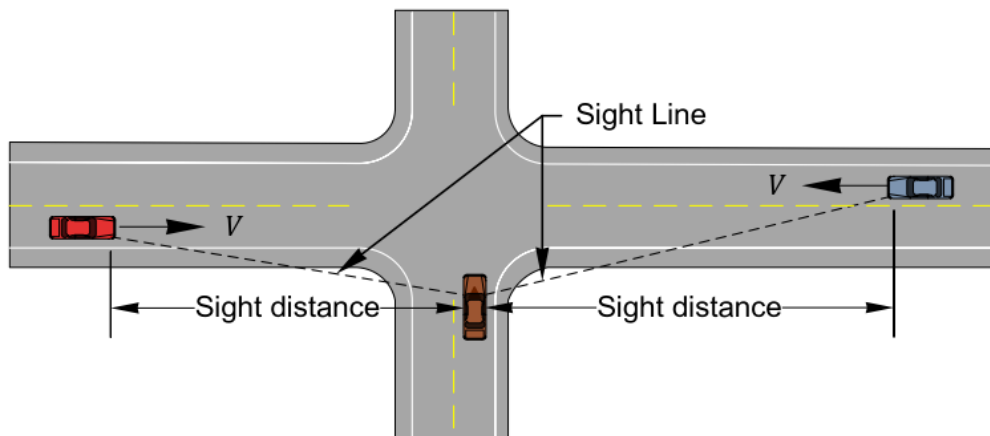
Pedestrian activity to and from the site is anticipated to be light to moderate. Adequate existing sidewalks serve the pedestrian traffic between the project site and the surrounding neighborhoods and commercial activities. The frontage improvements associated with the proposed development include new sidewalk along Goerig Street and Buckeye Street/Lakeshore Drive. The sidewalk shall be constructed to meet current Americans with Disabilities Act (ADA) standards.

Bicycle activity to and from the site is anticipated to be light to moderate. There are no existing bike lanes along Goerig Street and Buckeye Street/Lakeshore Drive or within the project vicinity. The future improvements to the I-5/SR 503 interchange is anticipated to add bike lanes to Goerig Street.

With any improvements to the Goerig Street/Lakeshore Drive/Buckeye Street intersection should include bicycling improvements on Goerig Street and Lakeshore Drive to provide access to the existing destination such as the Horse Shoe Lake and the middle school and future destinations such as the Library and YMCA.

### 5.5 Sight Distance at Site Access Locations

The proposed access into the Woodland Library development needs approximately 240 feet of sight distance to the right and approximately 280 feet of sight distance to the left, from the perspective of the exiting driver, to meet intersection sight distances (ISD) recommended by AASHTO (see References) based on the Lakeshore Drive and the 25 MPH speed limit. The following diagram illustrates the sight distance measurement.



The existing driveway location does not have any significant sight restrictions. The intersection of Goerig Street is approximately 230 feet away but the traffic approaching from the intersection will be traveling below 25 mph as they depart the intersection and thus they will still meet safe stopping distance.

As the library site is developed care should be taken to maintain clear sight distance between the driveway to the intersection of Goerig Street and 270 feet to the south east on Lakeshore Drive.

## 6 STUDY FINDINGS

The findings of the traffic impact analysis are listed below.

### 6.1 Future Traffic Volumes Increase

Traffic volumes in the study area vicinity will continue to increase with or without the project. A 1 percent annual compounded growth rate was applied in both the short-term (2025) and long-term (2045) analysis for all studied intersections.

### 6.2 Access Configuration

The project proposes two access points: a one-way lane that services the book drop from Goerig Street that directs vehicles to the parking lot and the parking lot access from Lakeshore Drive. There are no proposed turn pockets or turning restrictions regarding the access points.

### 6.3 Trip Generation

The proposed Woodland Community Library development is estimated to generate 540 trips on a typical weekday, including 11 trips during the AM peak hour and 71 trips during the PM peak hour.

For traffic impact fee (TIF) calculations the net new PM peak hour trips are 60 based on the deduction from the existing Woodland Community Library.

#### **6.4 Level of Service Analysis**

The Goerig Street, Lakeshore Drive, and Buckeye Street intersection currently operates at LOS E for the Buckeye Street approach with 46 seconds of delay in the PM peak hour. All other studied intersections currently operate at LOS of D or better in the AM and PM peak hours.

In 2025, with and without the project, the Goerig Street, Lakeshore Drive, and Buckeye Street intersection operates at levels of service LOS F in the AM and PM peak hours for the Buckeye Street approach. All other studied intersections operate at LOS of D or better in the AM and PM peak hours.

Mitigation at the Goerig Street/Lakeshore Drive/Buckeye Street intersection was addressed in an intersection control evaluation report dated December 19, 2018. With a traffic signal, left-turn lanes on Goerig Street and a right-turn lane on Lakeshore Drive, the LOS is B for 2045 with or without the project.

In 2045 PM peak, the I-5 NB off-ramp/Atlantic Street/Lewis River Road intersection and the CC Street/Lewis River Road intersection both operate at LOS E with or without the project. It is assumed that with project to modify the I-5/SR 503 interchange, will improve the operation of these intersection to LOS D or better.

#### **6.5 Driveway Analysis**

No right- or left-turn lanes are needed at site driveways.

#### **6.6 Queue Analysis**

Several intersections have and are projected to have queues exceeding the storage capacity of the lanes. The Library project will add very little additional queues to these intersections. The I-5/SR 503 interchange project should address these long queues.

#### **6.7 Collision Analysis**

The 2013–2017 collision history at the study intersections was reviewed; all intersections have collision rates lower than the critical rate, and no patterns of collision types or of severe collisions were identified.

#### **6.8 Transit, Pedestrian, and Bicycle Facilities**

KWRL Transportation provides school bus service to the Kalama-Woodland-Ridgefield-La Center area. The nearest bus stop lies approximately 0.2 mile to the west of the project site adjacent to the Woodland Middle School.

At the project's completion, public sidewalks will extend along both site frontages (Goerig Street and Buckeye Street/Lakeshore Drive) which will serve the pedestrian traffic between the project site and the surrounding neighborhoods and commercial activities. Bicycle activity to and from the site is anticipated to be light to moderate. There are no existing bike lanes along Goerig Street and Buckeye Street/Lakeshore Drive or within the project vicinity. The I-5/SR503 interchange project proposes to add bike lanes to the Goerig Street/Lewis River Road corridor. Any improvements at the Goerig Street/Lakeshore Drive/Buckeye Street intersection should include bicycle improvements, such as bike lanes.

### **7 RECOMMENDATIONS**

The TIA supports the following recommendations:

### **7.1 Level of Service**

The library project should contribute a proportionate share to a project that installs a traffic signal with left-turn lanes on Goerig Street and a right-turn lane on Lakeshore Drive.

### **7.2 Accessibility**

Assure all sidewalks, curb ramps, and the driveways constructed with the project are ADA compliant.

### **7.3 Bicycle Improvements**

With improvements to the Goerig Street/Lakeshore Drive/Buckeye Street intersection, the bike lanes should be included on both Goerig Street and Lakeshore Drive.

### **7.4 Driveway**

Design the proposed driveway access points consistent with AASHTO sight distance guidelines. The Lakeshore Drive driveway for the project should be aligned with the park and ride driveway on the north side of Lakeshore.

Do not install objects within the sight distance triangles that would block drivers' view when exiting the site at either of the access points.

## **8 REFERENCES**

American Association of State Highway and Transportation Officials (AASHTO). (2011). *A Policy on the Geometric Design of Highways and Streets*, 6th Edition.

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# Figures

Figure 1. Vicinity Map

Figure 2. Site Plan

Figure 3. Existing Lane Configurations and Traffic Controls

Figure 4. 2018 Existing Volumes

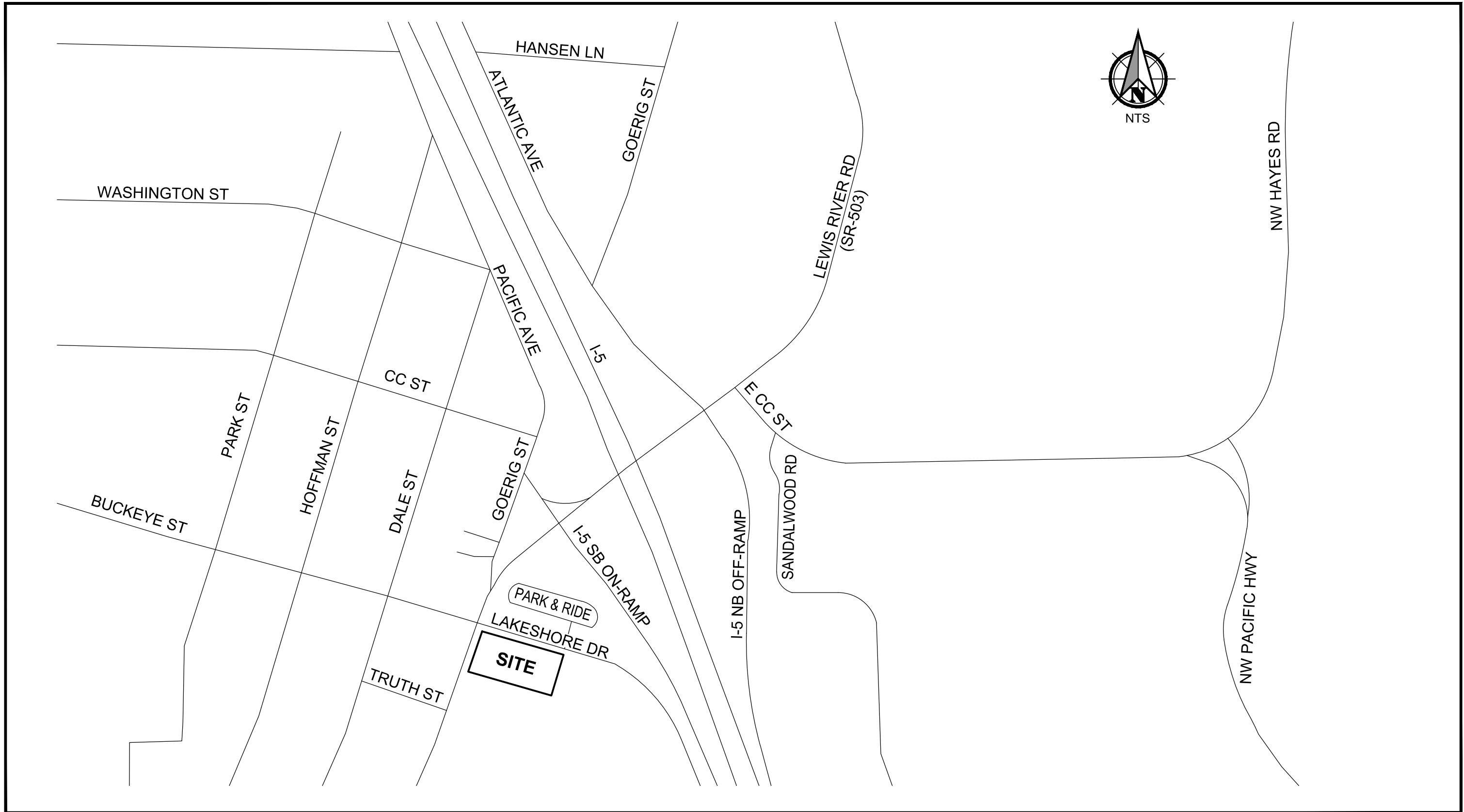
Figure 5. Trip Distribution and Assignment

Figure 6. 2025 Without Project Volumes

Figure 7. 2025 With Project Volumes

Figure 8. 2045 Without Project Volumes

Figure 9. 2045 With Project Volumes

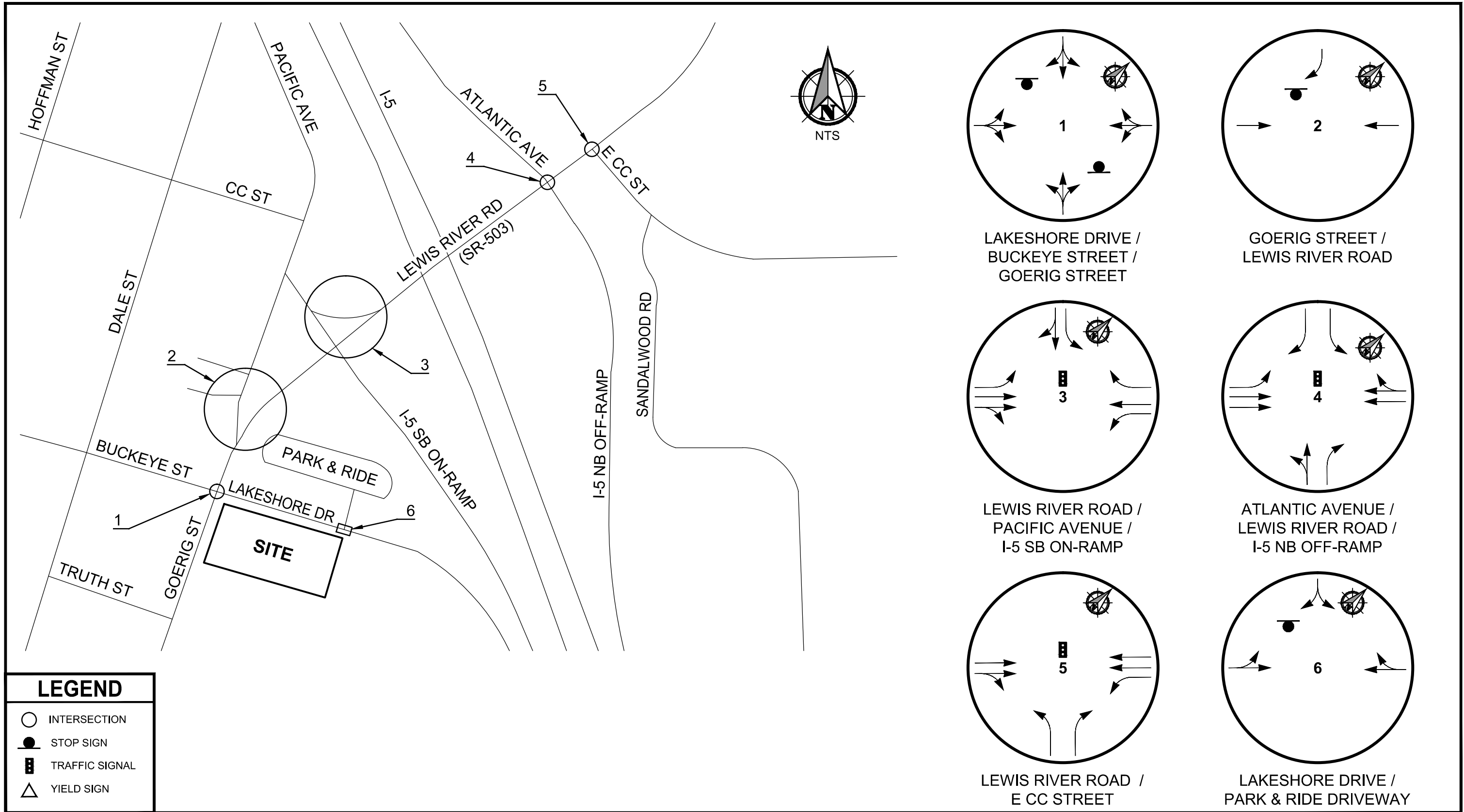


Vicinity Map  
Woodland Community Library





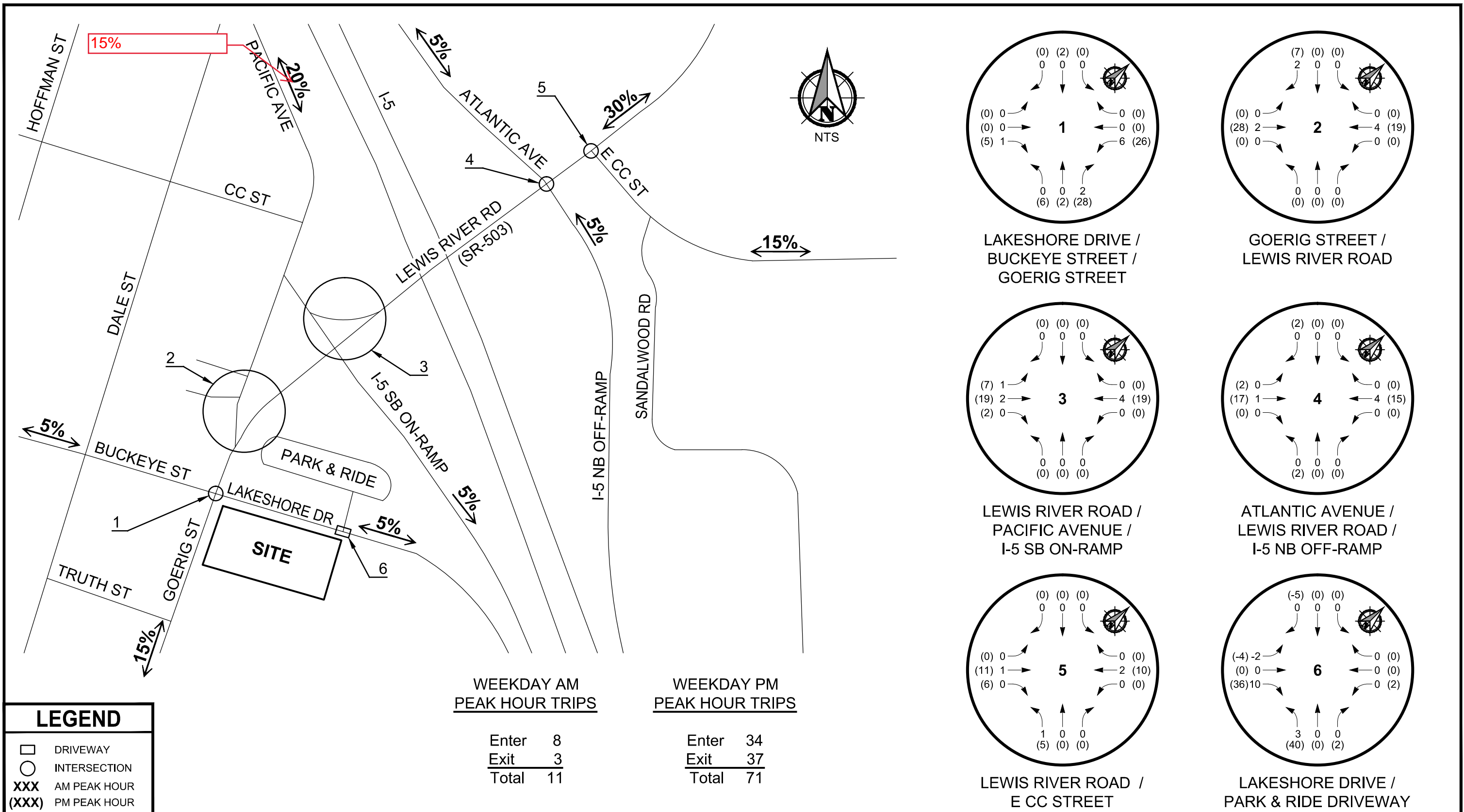
Site Plan  
Woodland Community Library



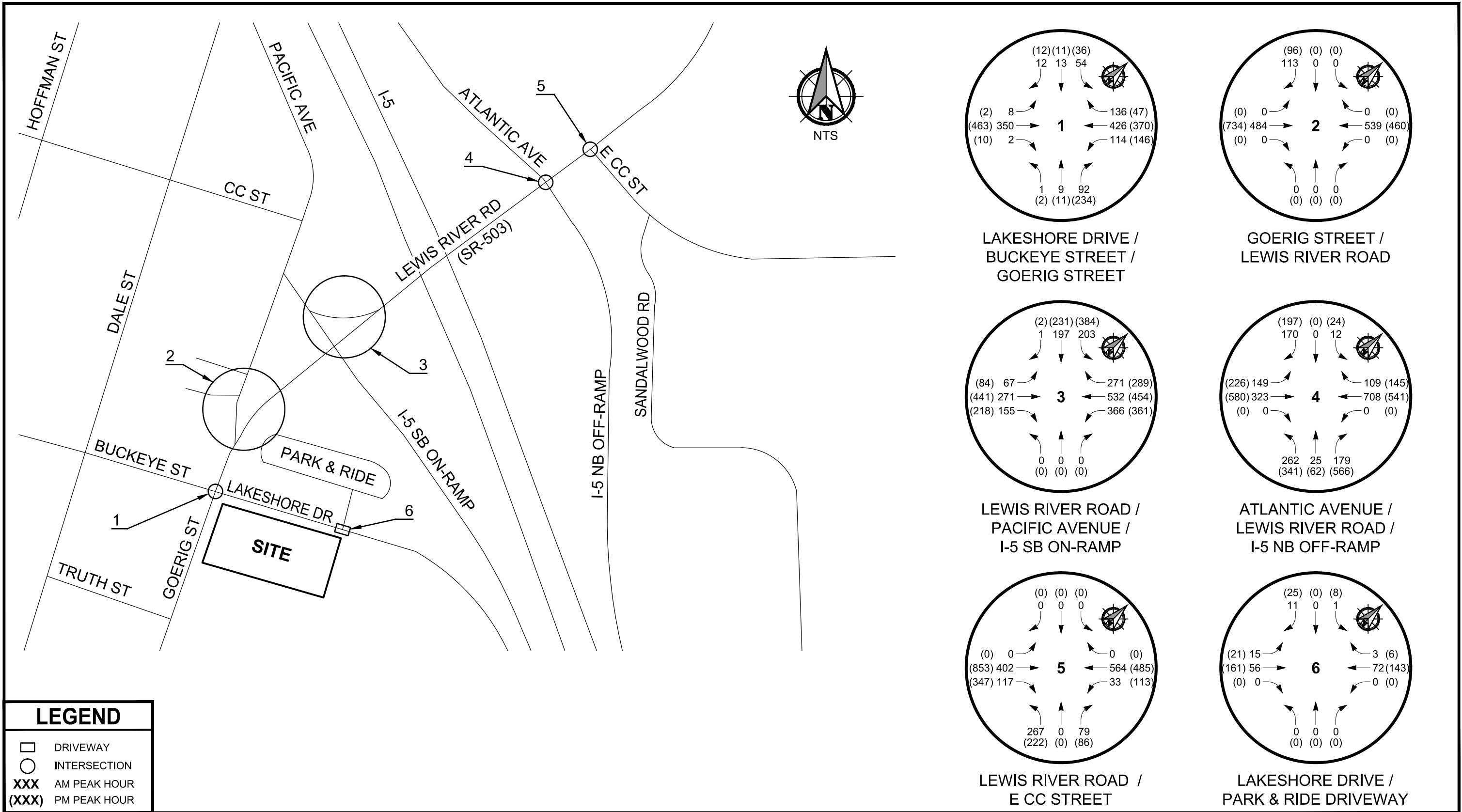
**Existing Lane Configurations and Traffic Controls**  
**Woodland Community Library**

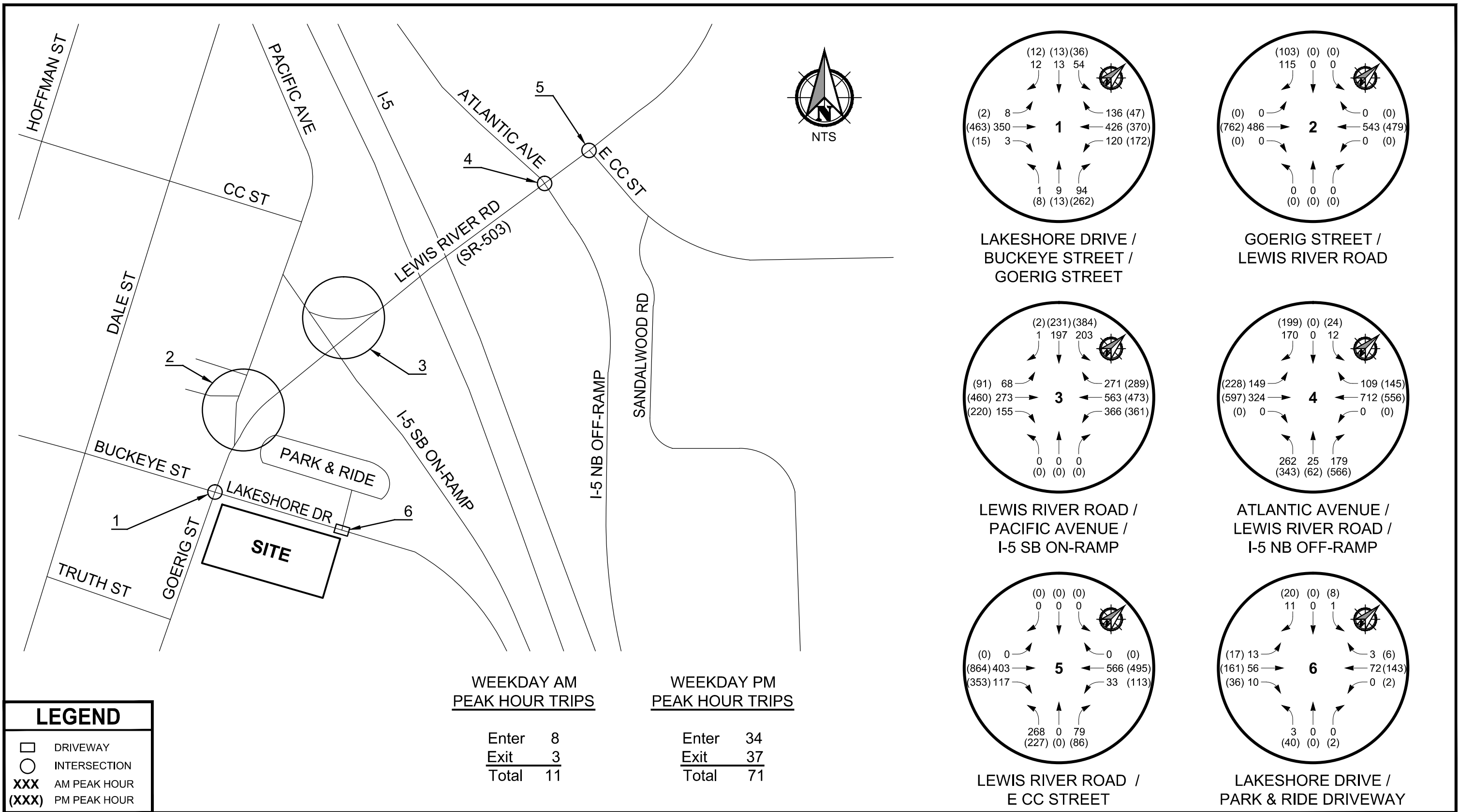






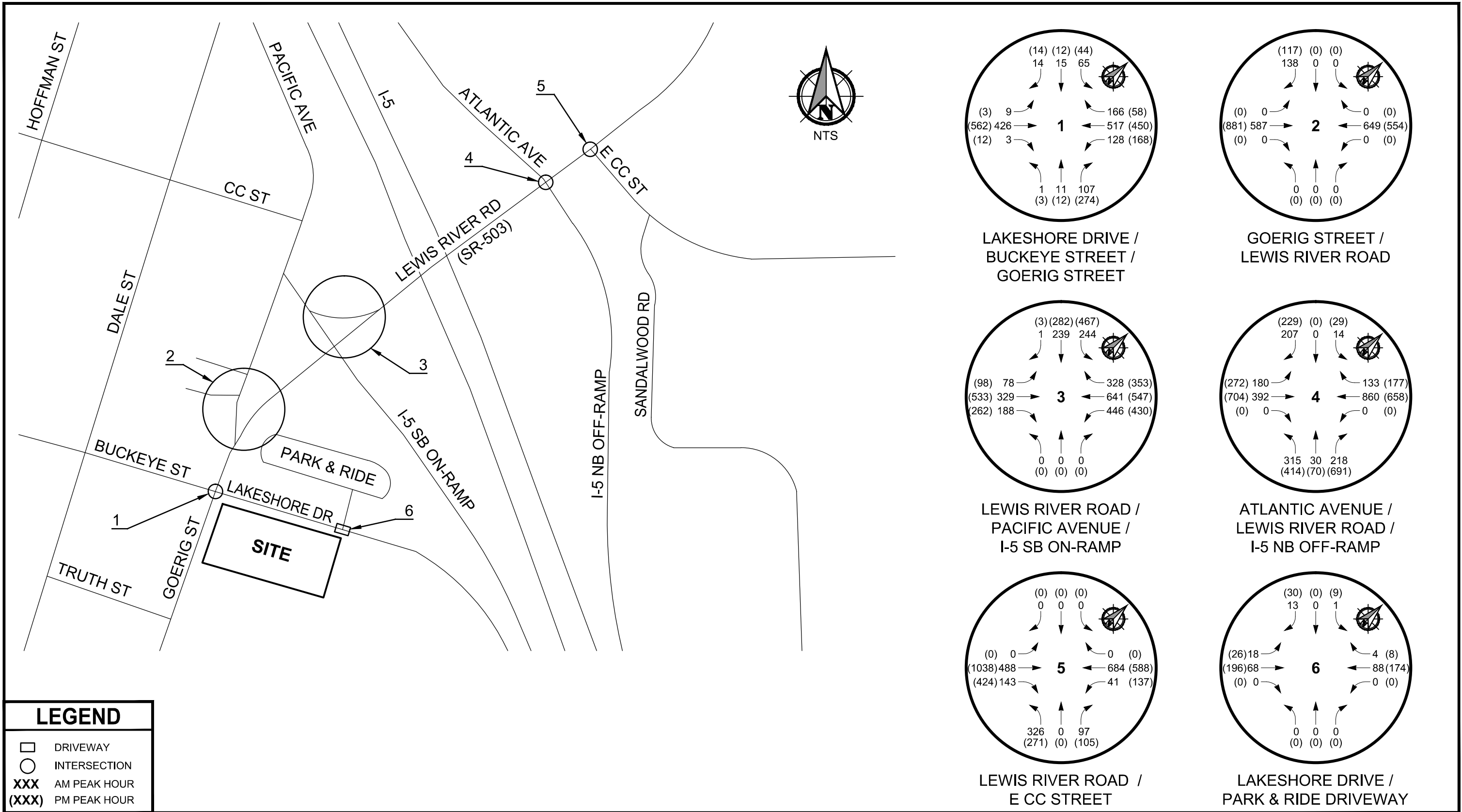
**Trip Distribution and Assignment  
Woodland Community Library**

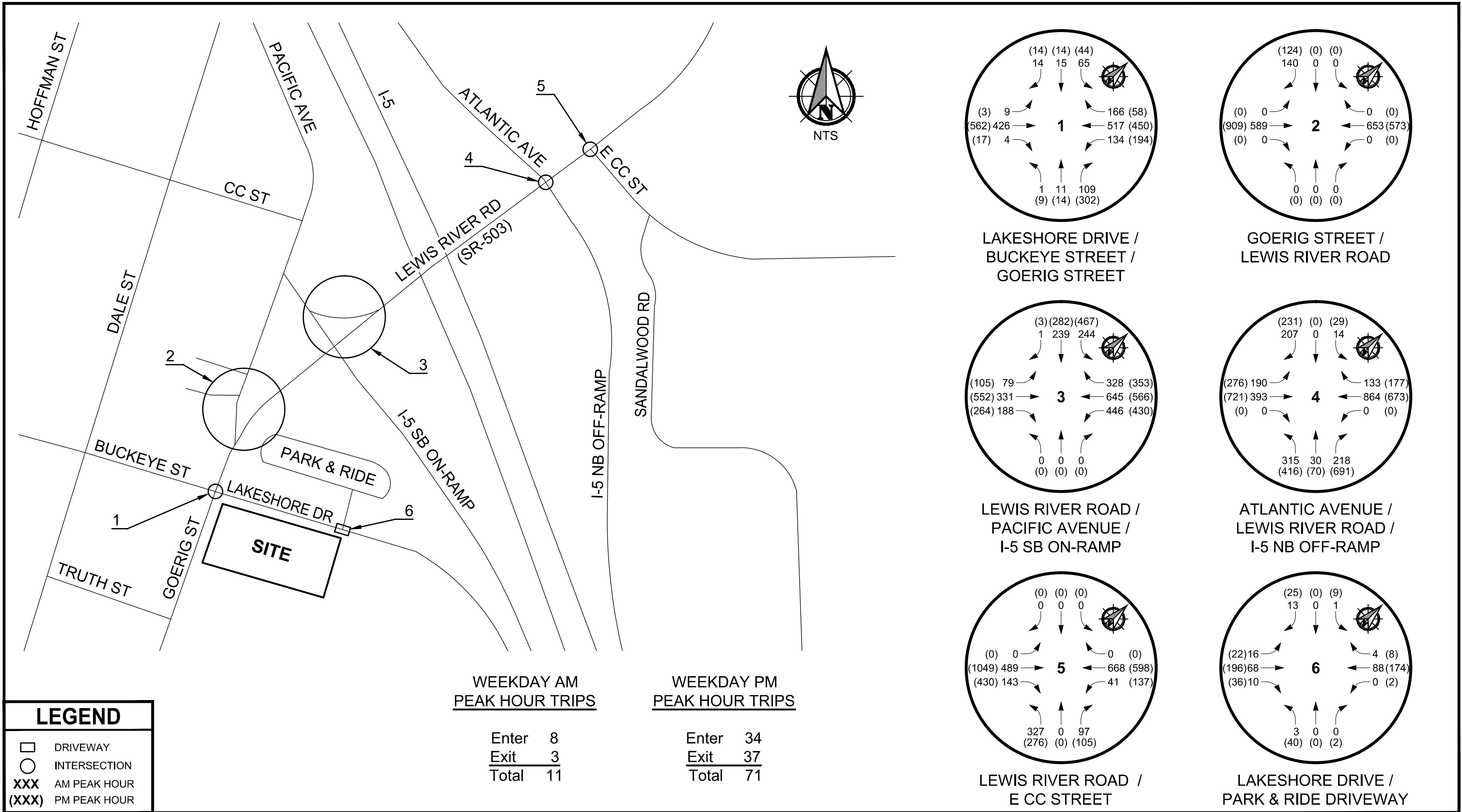




**2025 With Project Volumes**  
**Woodland Community Library**

DEC 2018
FIGURE
<b>7</b>







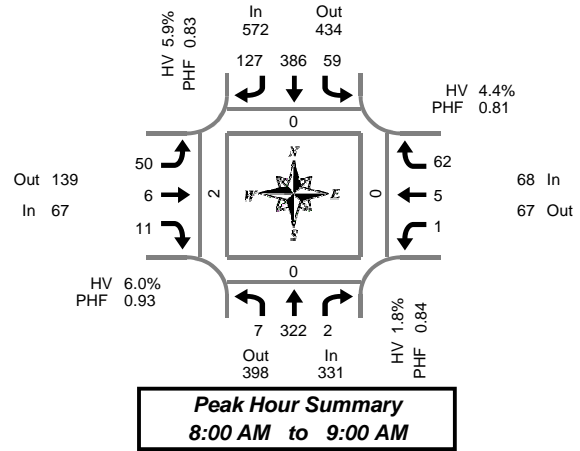
# **Appendix A**

## **Traffic Counts**

# Total Vehicle Summary



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## Goerig St & Buckeye St

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	2	42	1	0	24	31	3	0	13	2	0	0	1	1	20	0	140	0	0	0	0
7:15 AM	0	40	1	0	10	43	2	0	10	0	1	0	0	0	20	0	127	0	0	0	0
7:30 AM	1	47	1	0	11	57	3	0	4	0	0	0	1	0	14	0	139	0	0	0	1
7:45 AM	2	48	1	0	13	63	18	0	5	1	0	0	1	0	17	1	169	0	0	0	0
8:00 AM	2	63	0	0	12	84	36	0	12	0	1	0	0	3	14	0	227	0	0	0	0
8:15 AM	2	88	0	0	20	102	50	0	11	3	4	0	0	2	16	0	298	0	0	0	1
8:30 AM	2	94	2	0	16	117	29	0	14	1	3	0	1	0	11	0	290	0	0	0	0
8:45 AM	1	77	0	0	11	83	12	0	13	2	3	0	0	0	21	0	223	0	0	0	1
9:00 AM	2	60	0	0	14	49	11	0	9	0	1	0	0	0	14	0	160	0	0	0	0
9:15 AM	0	44	0	0	12	39	4	0	10	1	2	2	0	1	16	0	129	0	0	0	0
Total Survey	14	603	6	0	143	668	168	0	101	10	15	2	4	7	163	1	1,902	0	0	0	3

### Peak Hour Summary 8:00 AM to 9:00 AM

By Approach	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	331	398	729	0	572	434	1,006	0	67	139	206	0	68	67	135	0	1,038	0	0	0	2
%HV	1.8%				5.9%				6.0%				4.4%				4.5%				
PHF	0.84				0.83				0.93				0.81				0.87				

By Movement	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	7	322	2	331	59	386	127	572	50	6	11	67	1	5	62	68	1,038
%HV	14.3%	1.6%	0.0%	1.8%	11.9%	3.6%	10.2%	5.9%	8.0%	0.0%	0.0%	6.0%	0.0%	0.0%	4.8%	4.4%	4.5%
PHF	0.88	0.86	0.25	0.84	0.74	0.82	0.64	0.83	0.89	0.50	0.69	0.93	0.25	0.42	0.74	0.81	0.87

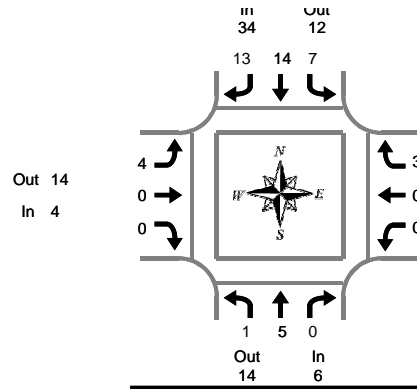
### Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	5	177	4	0	58	194	26	0	32	3	1	0	3	1	71	1	575	0	0	0	1
7:15 AM	5	198	3	0	46	247	59	0	31	1	2	0	2	3	65	1	662	0	0	0	1
7:30 AM	7	246	2	0	56	306	107	0	32	4	5	0	2	5	61	1	833	0	0	0	2
7:45 AM	8	293	3	0	61	366	133	0	42	5	8	0	2	5	58	1	984	0	0	0	1
8:00 AM	7	322	2	0	59	386	127	0	50	6	11	0	1	5	62	0	1,038	0	0	0	2
8:15 AM	7	319	2	0	61	351	102	0	47	6	11	0	1	2	62	0	971	0	0	0	2
8:30 AM	5	275	2	0	53	288	56	0	46	4	9	2	1	1	62	0	802	0	0	0	1

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Goerig St & Buckeye St

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

**Peak Hour Summary**  
8:00 AM to 9:00 AM

### Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:30 AM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	5	0	0	5	5	2	0	7	0	0	6	6	19
7:15 AM	0	2	0	2	0	2	0	2	2	0	0	2	0	0	1	1	7
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2
7:45 AM	0	6	0	6	1	2	0	3	0	0	0	0	0	0	3	3	12
8:00 AM	0	1	0	1	1	1	5	7	1	0	0	1	0	0	2	2	11
8:15 AM	1	2	0	3	1	9	6	16	1	0	0	1	0	0	0	0	20
8:30 AM	0	2	0	2	4	2	1	7	1	0	0	1	0	0	0	0	10
8:45 AM	0	0	0	0	1	2	1	4	1	0	0	1	0	0	1	1	6
9:00 AM	0	2	0	2	4	0	2	6	0	0	0	0	0	0	2	2	10
9:15 AM	0	1	0	1	2	2	2	6	0	0	0	0	0	1	1	2	9
Total Survey	1	17	0	18	19	20	17	56	11	2	0	13	0	1	18	19	106

### Heavy Vehicle Peak Hour Summary

8:00 AM to 9:00 AM

By Approach	Northbound Goerig St			Southbound Goerig St			Eastbound Buckeye St			Westbound Buckeye St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	14	20	34	12	46	4	14	18	3	7	10	47
PHF	0.15			0.28			0.11			0.08			0.27

By Movement	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	5	0	6	7	14	13	34	4	0	0	4	0	0	3	3	47
PHF	0.25	0.14	0.00	0.15	0.19	0.27	0.27	0.28	0.14	0.00	0.00	0.11	0.00	0.00	0.08	0.08	0.27

### Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:30 AM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	9	0	9	6	4	0	10	7	2	0	9	0	0	12	12	40
7:15 AM	0	9	0	9	2	5	5	12	3	0	0	3	0	0	8	8	32
7:30 AM	1	9	0	10	3	12	11	26	2	0	0	2	0	0	7	7	45
7:45 AM	1	11	0	12	7	14	12	33	3	0	0	3	0	0	5	5	53
8:00 AM	1	5	0	6	7	14	13	34	4	0	0	4	0	0	3	3	47
8:15 AM	1	6	0	7	10	13	10	33	3	0	0	3	0	0	3	3	46
8:30 AM	0	5	0	5	11	6	6	23	2	0	0	2	0	1	4	5	35

# Peak Hour Summary

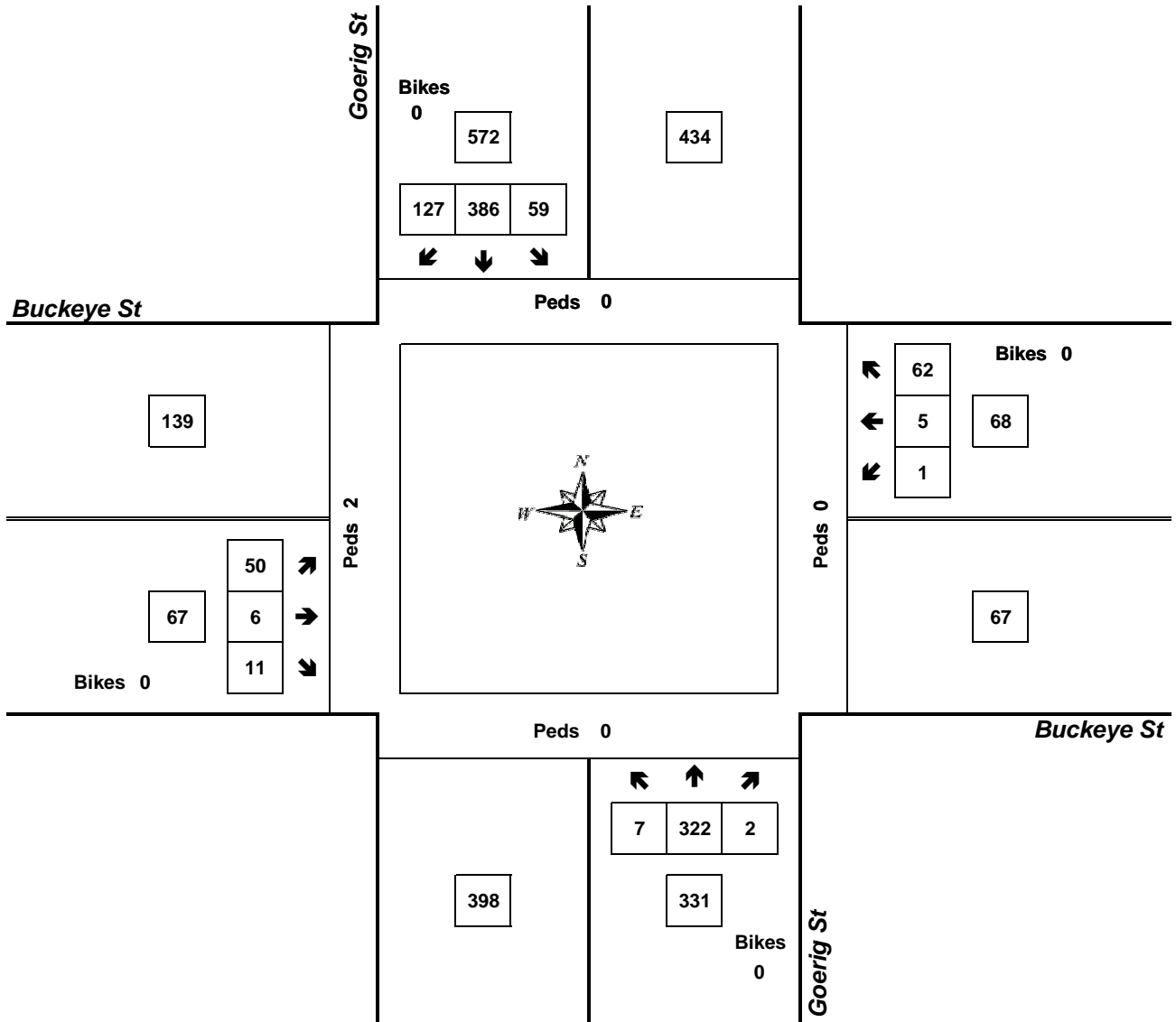


Clay Carney  
(503) 833-2740

## Goerig St & Buckeye St

8:00 AM to 9:00 AM

Thursday, May 24, 2018



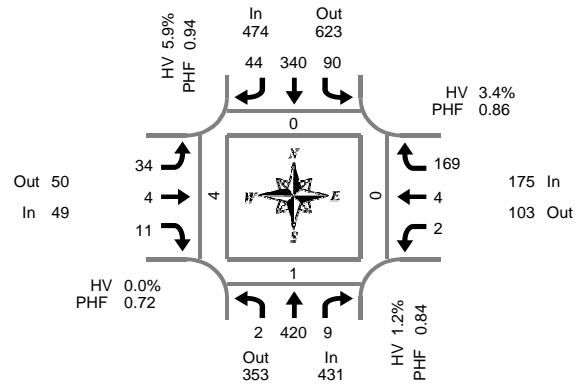
Approach	PHF	HV%	Volume
EB	0.93	6.0%	67
WB	0.81	4.4%	68
NB	0.84	1.8%	331
SB	0.83	5.9%	572
<b>Intersection</b>	<b>0.87</b>	<b>4.5%</b>	<b>1,038</b>

Count Period: 7:00 AM to 9:30 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## Goerig St & Buckeye St

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### 15-Minute Interval Summary

3:00 PM to 6:00 PM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	0	82	1	0	20	101	14	0	10	1	2	0	0	1	33	0	265	0	0	0	0
3:15 PM	0	101	0	0	27	88	19	0	8	1	4	0	0	1	23	0	272	0	0	0	1
3:30 PM	1	137	3	0	18	79	25	0	7	0	3	0	0	4	33	0	310	0	4	4	5
3:45 PM	1	89	0	0	18	59	8	0	17	1	4	0	1	0	31	0	229	0	0	0	0
4:00 PM	0	127	1	0	14	90	6	0	4	1	4	0	0	1	41	0	289	0	0	0	2
4:15 PM	0	110	1	0	23	82	9	0	7	0	2	0	2	1	47	1	284	0	1	0	2
4:30 PM	1	87	5	0	23	86	17	1	10	2	2	0	0	0	32	0	265	0	0	0	0
4:45 PM	1	96	2	0	30	82	12	0	13	1	3	1	0	2	49	0	291	0	0	0	0
5:00 PM	0	101	2	0	37	75	8	0	13	1	5	0	3	0	43	0	288	0	0	1	2
5:15 PM	3	79	3	0	35	74	12	0	15	5	2	0	2	1	25	0	256	0	1	0	3
5:30 PM	1	62	2	0	43	69	7	0	8	3	3	0	0	1	33	0	232	0	0	0	5
5:45 PM	0	62	0	0	34	82	9	0	9	1	2	0	1	2	33	0	235	2	0	0	3
Total Survey	8	1,133	20	0	322	967	146	1	121	17	36	1	9	14	423	1	3,216	2	6	5	23

### Peak Hour Summary

4:00 PM to 5:00 PM

By Approach	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	431	353	784	0	474	623	1,097	1	49	50	99	1	175	103	278	1	1,129	0	1	0	4
%HV	1.2%				5.9%				0.0%				3.4%				3.5%				
PHF	0.84				0.94				0.72				0.86				0.97				

By Movement	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	420	9	431	90	340	44	474	34	4	11	49	2	4	169	175	1,129
%HV	0.0%	1.0%	11.1%	1.2%	10.0%	2.1%	27.3%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	3.4%	3.5%
PHF	0.50	0.83	0.45	0.84	0.75	0.94	0.65	0.94	0.65	0.50	0.69	0.72	0.25	0.50	0.86	0.86	0.97

### Rolling Hour Summary

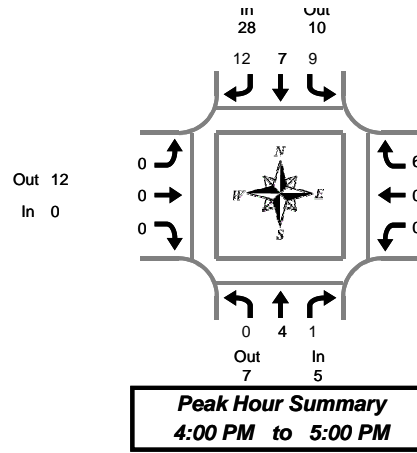
3:00 PM to 6:00 PM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	2	409	4	0	83	327	66	0	42	3	13	0	1	6	120	0	1,076	0	4	4	6
3:15 PM	2	454	4	0	77	316	58	0	36	3	15	0	1	6	128	0	1,100	0	4	4	8
3:30 PM	2	463	5	0	73	310	48	0	35	2	13	0	3	6	152	1	1,112	0	5	4	9
3:45 PM	2	413	7	0	78	317	40	1	38	4	12	0	3	2	151	1	1,067	0	1	0	4
4:00 PM	2	420	9	0	90	340	44	1	34	4	11	1	2	4	169	1	1,129	0	1	0	4
4:15 PM	2	394	10	0	113	325	46	1	43	4	12	1	5	3	171	1	1,128	0	1	1	4
4:30 PM	5	363	12	0	125	317	49	1	51	9	12	1	5	3	149	0	1,100	0	1	1	5
4:45 PM	5	338	9	0	145	300	39	0	49	10	13	1	5	4	150	0	1,067	0	1	1	10
5:00 PM	4	304	7	0	149	300	36	0	45	10	12	0	6	4	134	0	1,011	2	1	1	13

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Goerig St & Buckeye St

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	2	0	2	4	6	2	12	0	0	0	0	0	0	1	1	15
3:15 PM	0	3	0	3	6	10	2	18	0	0	0	0	0	0	1	1	22
3:30 PM	0	4	0	4	1	1	4	6	1	0	0	1	0	0	2	2	13
3:45 PM	0	11	0	11	5	2	1	8	0	0	0	0	0	0	2	2	21
4:00 PM	0	1	0	1	3	1	0	4	0	0	0	0	0	0	2	2	7
4:15 PM	0	1	0	1	0	2	3	5	0	0	0	0	0	0	3	3	9
4:30 PM	0	0	0	0	3	1	7	11	0	0	0	0	0	0	1	1	12
4:45 PM	0	2	1	3	3	3	2	8	0	0	0	0	0	0	0	0	11
5:00 PM	0	2	0	2	3	0	6	9	1	0	0	1	0	0	2	2	14
5:15 PM	0	1	0	1	1	2	1	4	0	0	0	0	0	0	2	2	7
5:30 PM	0	1	0	1	1	1	1	3	2	1	0	3	0	0	3	3	10
5:45 PM	0	1	0	1	4	2	1	7	0	0	0	0	0	0	2	2	10
Total Survey	0	29	1	30	34	31	30	95	4	1	0	5	0	0	21	21	151

### Heavy Vehicle Peak Hour Summary 4:00 PM to 5:00 PM

By Approach	Northbound Goerig St			Southbound Goerig St			Eastbound Buckeye St			Westbound Buckeye St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	7	12	28	10	38	0	12	12	6	10	16	39
PHF	0.07			0.19			0.00			0.21			0.17

By Movement	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	4	1	5	9	7	12	28	0	0	0	0	0	0	6	6	39
PHF	0.00	0.06	0.25	0.07	0.19	0.10	0.20	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.21	0.17

### Heavy Vehicle Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Goerig St				Southbound Goerig St				Eastbound Buckeye St				Westbound Buckeye St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	20	0	20	16	19	9	44	1	0	0	1	0	0	6	6	71
3:15 PM	0	19	0	19	15	14	7	36	1	0	0	1	0	0	7	7	63
3:30 PM	0	17	0	17	9	6	8	23	1	0	0	1	0	0	9	9	50
3:45 PM	0	13	0	13	11	6	11	28	0	0	0	0	0	0	8	8	49
4:00 PM	0	4	1	5	9	7	12	28	0	0	0	0	0	0	6	6	39
4:15 PM	0	5	1	6	9	6	18	33	1	0	0	1	0	0	6	6	46
4:30 PM	0	5	1	6	10	6	16	32	1	0	0	1	0	0	5	5	44
4:45 PM	0	6	1	7	8	6	10	24	3	1	0	4	0	0	7	7	42
5:00 PM	0	5	0	5	9	5	9	23	3	1	0	4	0	0	9	9	41

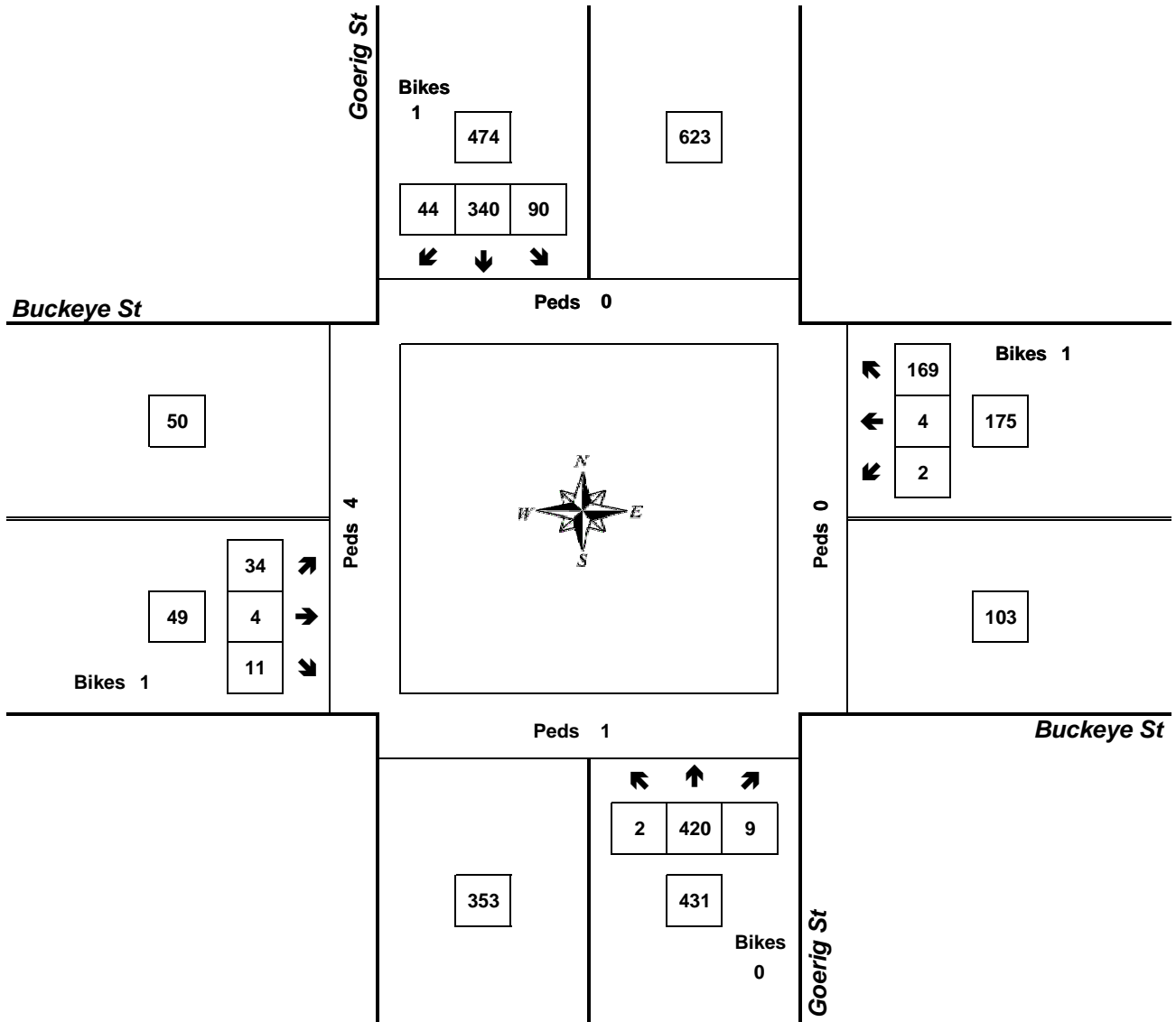
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## Goerig St & Buckeye St

4:00 PM to 5:00 PM  
Wednesday, May 23, 2018

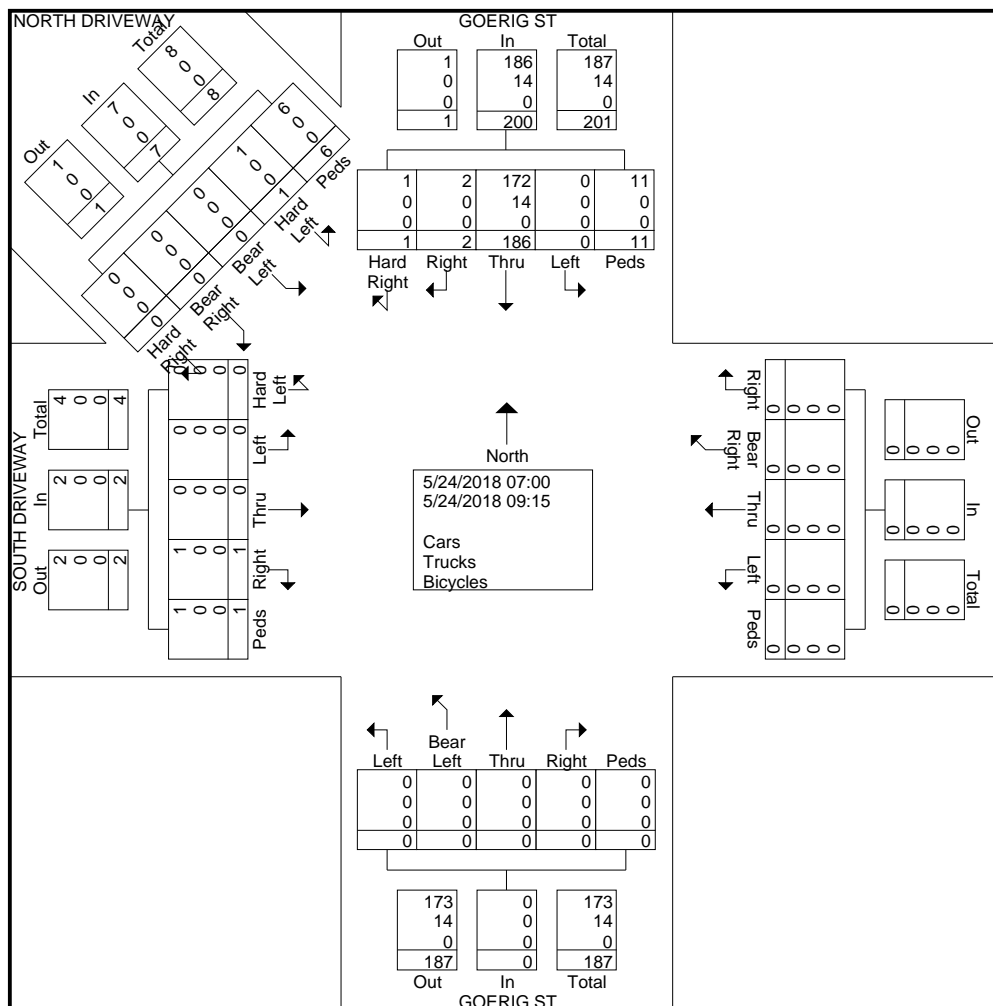


Approach	PHF	HV%	Volume
EB	0.72	0.0%	49
WB	0.86	3.4%	175
NB	0.84	1.2%	431
SB	0.94	5.9%	474
<b>Intersection</b>	<b>0.97</b>	<b>3.5%</b>	<b>1,129</b>

Count Period: 3:00 PM to 6:00 PM

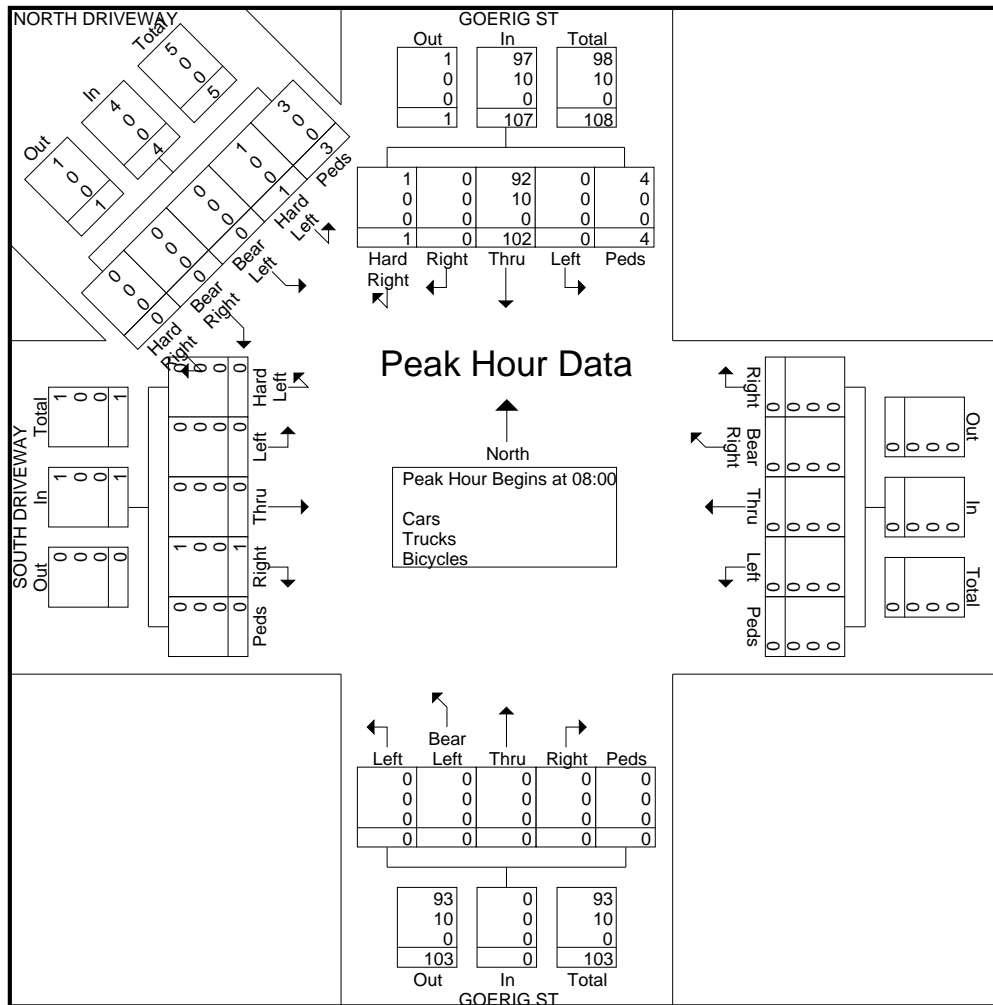
Groups Printed- Cars - Trucks - Bicycles

Start Time	GOERIG ST Southbound						Westbound						GOERIG ST Northbound						SOUTH DRIVEWAY Eastbound						NORTH DRIVEWAY Southeastbound						Int. Total
	Left	Thru	Right	Hard Right	Peds	App. Total	Left	Thru	Bear Right	Right	Peds	App. Total	Left	Bear Left	Thru	Right	Peds	App. Total	Hard Left	Left	Thru	Right	Peds	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	Peds	App. Total	
07:00	0	16	1	0	4	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	23
07:15	0	9	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
07:30	0	18	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	19	
07:45	0	14	0	0	2	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	17	
Total	0	57	1	0	6	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	3	3	68		
08:00	0	22	0	1	2	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	26
08:15	0	26	0	0	2	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	30	
08:30	0	29	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
08:45	0	25	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	27
Total	0	102	0	1	4	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	3	4	112	
09:00	0	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
09:15	0	13	1	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
Grand Total	0	186	2	1	11	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	0	0	6	7	209	
Apprch %	0	93	1	0.5	5.5		0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	50		14.3	0	0	0	85.7			
Total %	0	89	1	0.5	5.3	95.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	1	0.5	0	0	0	2.9	3.3		
Cars	0	172	2	1	11	186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	0	0	6	7	195		
% Cars	0	92.5	100	100	100	93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	100	100	0	0	0	100	100	93.3	
Trucks	0	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
% Trucks	0	7.5																													
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles																															



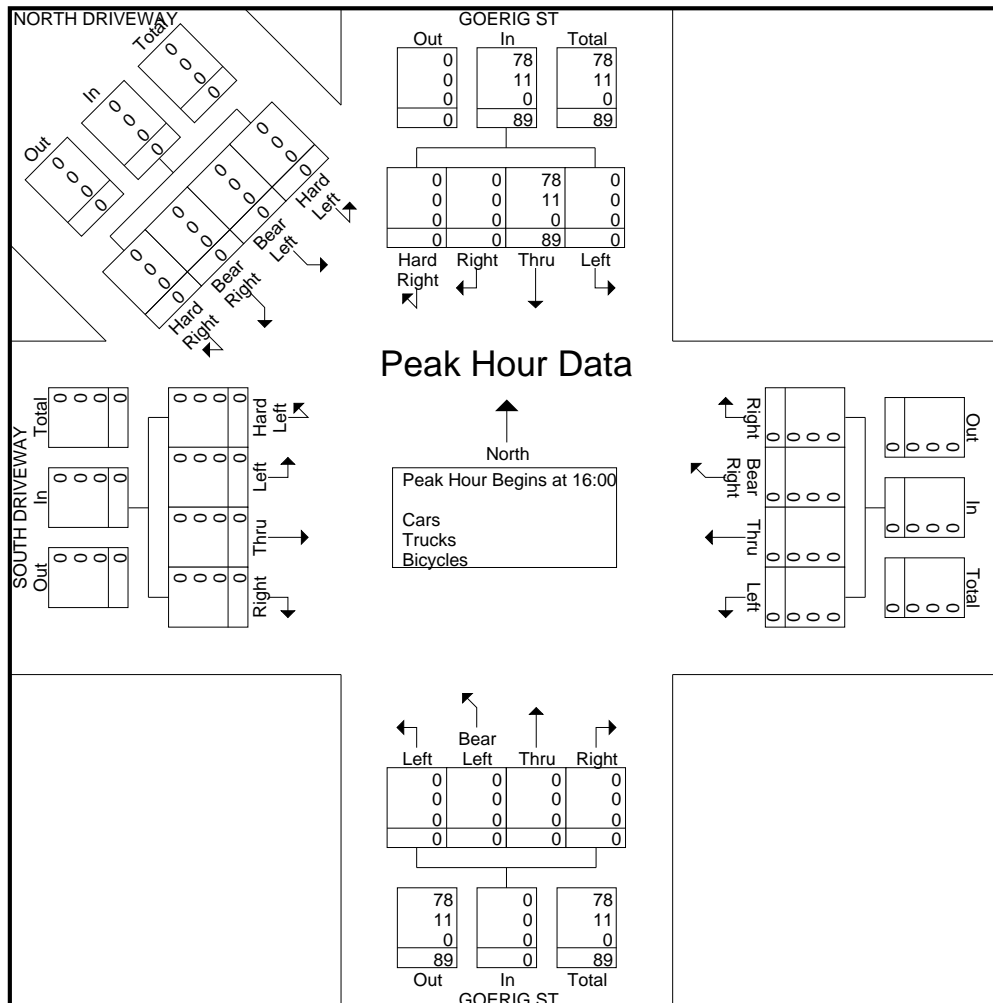


Start Time	GOERIG ST Southbound						Westbound						GOERIG ST Northbound						SOUTH DRIVEWAY Eastbound						NORTH DRIVEWAY Southeastbound						Int. Total					
	Left	Thru	Right	Hard Right	Peds	App. Total	Left	Thru	Bear Right	Right	Peds	App. Total	Left	Bear Left	Thru	Right	Peds	App. Total	Hard Left	Left	Thru	Right	Peds	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	Peds	App. Total						
Peak Hour Analysis From 07:00 to 09:15 - Peak 1 of 1																																				
Peak Hour for Entire Intersection Begins at 08:00																																				
08:00	0	22	0	1	2	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	26	
08:15	0	26	0	0	2	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	30		
08:30	0	29	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29		
08:45	0	25	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	1	1	27			
Total Volume	0	102	0	1	4	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	3	4	4	112					
% App. Total	0	95.3	0	0.9	3.7		0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0		25	0	0	0	75								
PHF	.000	.879	.000	.250	.500	.922	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250	.000	.000	.000	.375	.500			.933					
Cars	0	92	0	1	4	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	3	4			102				
% Cars	0	90.2		100	100	90.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			100			100					91.1				
Trucks	0	10	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10			
% Trucks		9.8																																		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
% Bicycles																																				





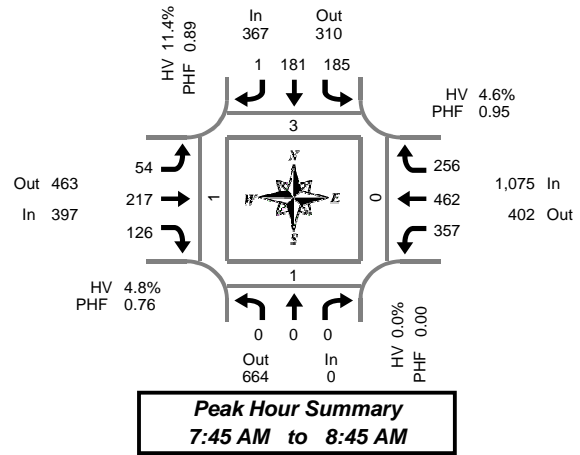
Start Time	GOERIG ST Southbound					Westbound					GOERIG ST Northbound					SOUTH DRIVEWAY Eastbound					NORTH DRIVEWAY Southeastbound					Int. Total					
	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total						
Peak Hour Analysis From 15:00 to 17:45 - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 16:00																															
16:00	0	20	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
16:15	0	20	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
16:30	0	26	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
16:45	0	23	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
Total Volume	0	89	0	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.856	.000	.000	.856	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.856	
Cars	0	78	0	0	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	
% Cars	0	87.6	0	0	87.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87.6	
Trucks	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	
% Trucks	0	12.4	0	0	12.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## Pacific Ave & Lewis River Rd

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	34	56	0	0	10	29	33	0	109	40	53	0	364	0	0	0	0
7:15 AM	0	0	0	0	32	43	0	0	5	28	34	0	136	47	68	0	393	0	0	0	0
7:30 AM	0	0	0	0	50	49	0	0	7	20	37	0	120	52	52	1	387	0	0	0	0
7:45 AM	0	0	0	0	47	50	0	0	12	35	28	0	99	77	72	0	420	0	0	0	0
8:00 AM	0	0	0	0	40	38	1	0	15	39	33	0	88	113	62	1	429	2	0	0	0
8:15 AM	0	0	0	0	57	46	0	0	13	65	27	0	73	147	62	0	490	1	1	0	1
8:30 AM	0	0	0	0	41	47	0	0	14	78	38	0	97	125	60	0	500	0	0	0	0
8:45 AM	0	0	0	0	36	46	0	0	8	60	41	0	83	80	59	0	413	1	0	0	0
9:00 AM	0	0	0	0	53	37	0	1	7	47	27	0	73	59	36	1	339	0	0	0	0
9:15 AM	0	0	0	0	41	41	0	0	10	37	20	0	63	43	59	0	314	0	1	0	1
Total Survey	0	0	0	0	431	453	1	1	101	438	318	0	941	783	583	3	4,049	4	2	0	2

### Peak Hour Summary 7:45 AM to 8:45 AM

By Approach	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	664	664	0	367	310	677	0	397	463	860	0	1,075	402	1,477	1	1,839	3	1	0	1
%HV	0.0%				11.4%				4.8%				4.6%				6.0%				
PHF	0.00				0.89				0.76				0.95				0.92				

By Movement	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	185	181	1	367	54	217	126	397	357	462	256	1,075	1,839
%HV	0.0%	0.0%	0.0%	0.0%	11.4%	11.6%	0.0%	11.4%	1.9%	4.1%	7.1%	4.8%	4.8%	4.5%	4.3%	4.6%	6.0%
PHF	0.00	0.00	0.00	0.00	0.81	0.91	0.25	0.89	0.90	0.70	0.83	0.76	0.90	0.79	0.89	0.95	0.92

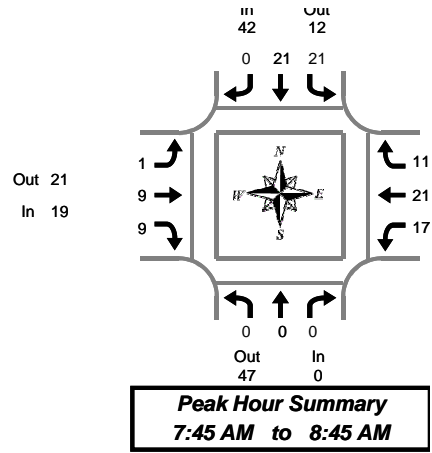
### Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	163	198	0	0	34	112	132	0	464	216	245	1	1,564	0	0	0	0
7:15 AM	0	0	0	0	169	180	1	0	39	122	132	0	443	289	254	2	1,629	2	0	0	0
7:30 AM	0	0	0	0	194	183	1	0	47	159	125	0	380	389	248	2	1,726	3	1	0	1
7:45 AM	0	0	0	0	185	181	1	0	54	217	126	0	357	462	256	1	1,839	3	1	0	1
8:00 AM	0	0	0	0	174	177	1	0	50	242	139	0	341	465	243	1	1,832	4	1	0	1
8:15 AM	0	0	0	0	187	176	0	1	42	250	133	0	326	411	217	1	1,742	2	1	0	1
8:30 AM	0	0	0	0	171	171	0	1	39	222	126	0	316	307	214	1	1,566	1	1	0	1

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Pacific Ave & Lewis River Rd

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	4	3	0	7	1	5	3	9	6	2	8	16	32
7:15 AM	0	0	0	0	6	1	0	7	0	2	2	4	4	1	2	7	18
7:30 AM	0	0	0	0	4	8	0	12	0	2	1	3	0	0	3	3	18
7:45 AM	0	0	0	0	7	5	0	12	1	4	4	9	3	2	3	8	29
8:00 AM	0	0	0	0	5	6	0	11	0	2	2	4	1	7	1	9	24
8:15 AM	0	0	0	0	4	8	0	12	0	0	2	2	6	10	5	21	35
8:30 AM	0	0	0	0	5	2	0	7	0	3	1	4	7	2	2	11	22
8:45 AM	0	0	0	0	6	5	0	11	0	1	1	2	3	3	3	9	22
9:00 AM	0	0	0	0	2	4	0	6	0	0	4	4	2	4	2	8	18
9:15 AM	0	0	0	0	4	2	0	6	0	0	1	1	1	5	12	18	25
Total Survey	0	0	0	0	47	44	0	91	2	19	21	42	33	36	41	110	243

### Heavy Vehicle Peak Hour Summary 7:45 AM to 8:45 AM

By Approach	Northbound Pacific Ave			Southbound Pacific Ave			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	47	47	42	12	54	19	21	40	49	30	79	110
PHF	0.00			0.30			0.30			0.30			0.31

By Movement	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	21	21	0	42	1	9	9	19	17	21	11	49	110
PHF	0.00	0.00	0.00	0.00	0.31	0.28	0.00	0.30	0.25	0.25	0.28	0.30	0.27	0.28	0.16	0.30	0.31

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	21	17	0	38	2	13	10	25	13	5	16	34	97
7:15 AM	0	0	0	0	22	20	0	42	1	10	9	20	8	10	9	27	89
7:30 AM	0	0	0	0	20	27	0	47	1	8	9	18	10	19	12	41	106
7:45 AM	0	0	0	0	21	21	0	42	1	9	9	19	17	21	11	49	110
8:00 AM	0	0	0	0	20	21	0	41	0	6	6	12	17	22	11	50	103
8:15 AM	0	0	0	0	17	19	0	36	0	4	8	12	18	19	12	49	97
8:30 AM	0	0	0	0	17	13	0	30	0	4	7	11	13	14	19	46	87

# Peak Hour Summary

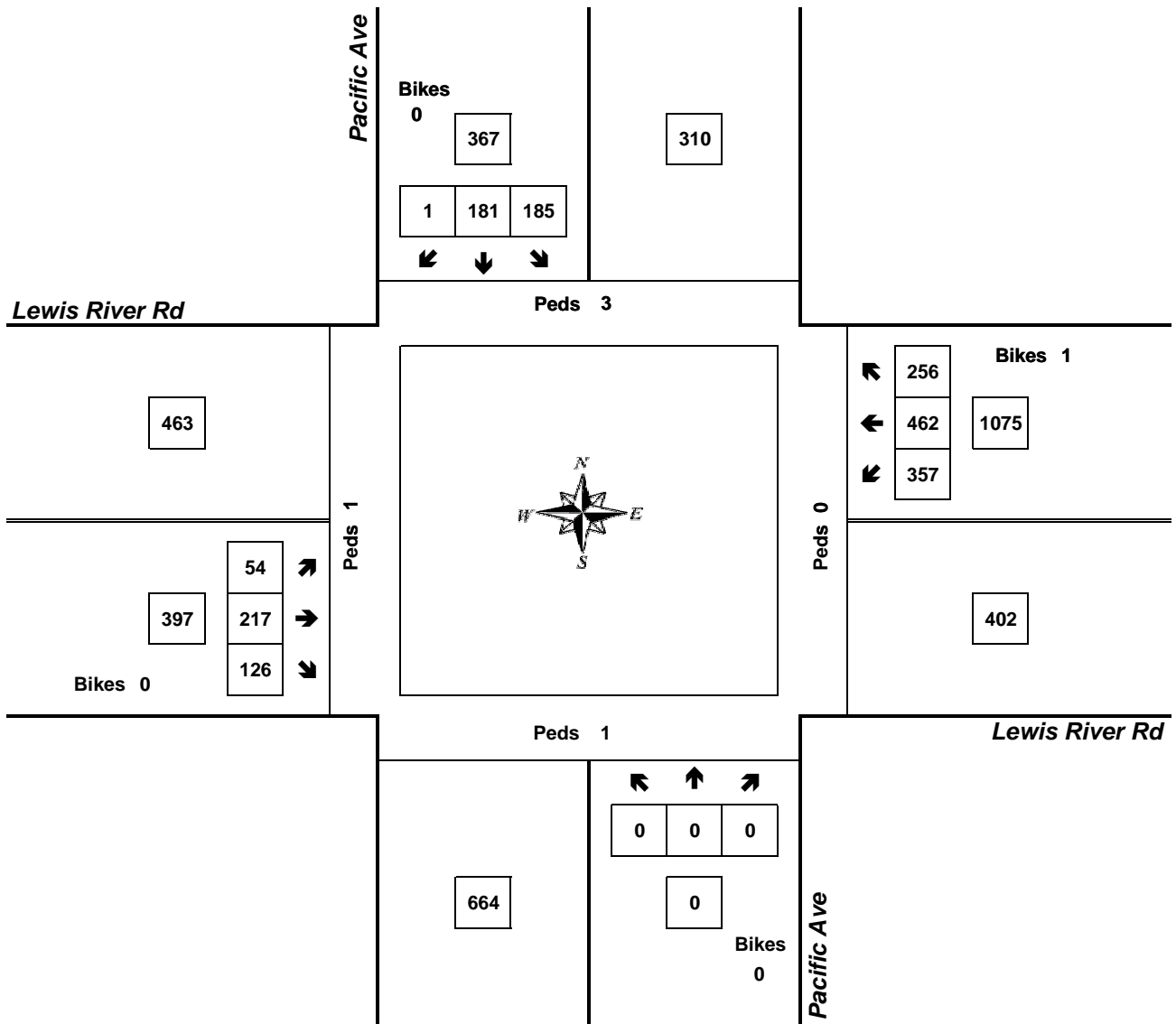


Clay Carney  
(503) 833-2740

## Pacific Ave & Lewis River Rd

7:45 AM to 8:45 AM

Thursday, May 24, 2018



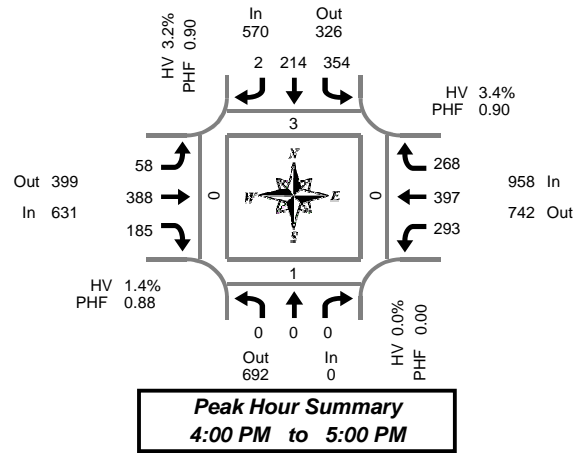
Approach	PHF	HV%	Volume
EB	0.76	4.8%	397
WB	0.95	4.6%	1,075
NB	0.00	0.0%	0
SB	0.89	11.4%	367
<b>Intersection</b>	<b>0.92</b>	<b>6.0%</b>	<b>1,839</b>

Count Period: 7:00 AM to 9:30 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## Pacific Ave & Lewis River Rd

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	0	0	0	0	81	42	0	0	16	76	49	0	55	118	67	0	504	2	1	0	1
3:15 PM	0	0	0	0	97	38	0	0	10	82	34	0	68	116	63	0	508	1	0	0	1
3:30 PM	0	0	0	0	86	49	1	0	8	114	40	0	72	104	54	0	528	4	0	0	0
3:45 PM	0	0	0	0	92	63	0	0	6	106	36	0	65	77	68	0	513	12	4	0	1
4:00 PM	0	0	0	0	103	54	1	0	16	105	59	0	58	96	64	0	556	1	0	0	0
4:15 PM	0	0	0	0	71	59	1	0	12	107	46	3	92	92	52	0	532	0	1	0	0
4:30 PM	0	0	0	0	87	43	0	0	14	78	36	0	74	104	61	1	497	2	0	0	0
4:45 PM	0	0	0	0	93	58	0	0	16	98	44	0	69	105	91	1	574	0	0	0	0
5:00 PM	0	0	0	0	95	49	0	0	14	94	50	0	59	108	59	0	528	0	1	0	0
5:15 PM	0	0	0	0	109	52	0	0	12	80	27	0	74	101	66	0	521	3	0	0	0
5:30 PM	0	0	0	0	74	38	0	0	5	66	37	0	49	90	65	0	424	0	0	0	0
5:45 PM	0	0	0	0	76	38	0	0	8	63	29	0	64	101	59	0	438	0	2	0	0
Total Survey	0	0	0	0	1,064	583	3	0	137	1,069	487	3	799	1,212	769	2	6,123	25	9	0	3

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

By Approach	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	692	692	0	570	326	896	0	631	399	1,030	3	958	742	1,700	2	2,159	3	1	0	0
%HV	0.0%				3.2%				1.4%				3.4%				2.8%				
PHF	0.00				0.90				0.88				0.90				0.94				

By Movement	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	354	214	2	570	58	388	185	631	293	397	268	958	2,159
%HV	0.0%	0.0%	0.0%	0.0%	2.0%	5.1%	0.0%	3.2%	1.7%	1.3%	1.6%	1.4%	2.7%	4.3%	3.0%	3.4%	2.8%
PHF	0.00	0.00	0.00	0.00	0.86	0.91	0.50	0.90	0.91	0.91	0.78	0.88	0.80	0.95	0.74	0.90	0.94

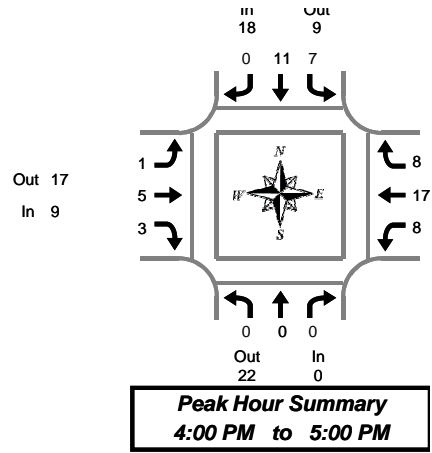
### Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	0	0	0	0	356	192	1	0	40	378	159	0	260	415	252	0	2,053	19	5	0	3
3:15 PM	0	0	0	0	378	204	2	0	40	407	169	0	263	393	249	0	2,105	18	4	0	2
3:30 PM	0	0	0	0	352	225	3	0	42	432	181	3	287	369	238	0	2,129	17	5	0	1
3:45 PM	0	0	0	0	353	219	2	0	48	396	177	3	289	369	245	1	2,098	15	5	0	1
4:00 PM	0	0	0	0	354	214	2	0	58	388	185	3	293	397	268	2	2,159	3	1	0	0
4:15 PM	0	0	0	0	346	209	1	0	56	377	176	3	294	409	263	2	2,131	2	2	0	0
4:30 PM	0	0	0	0	384	202	0	0	56	350	157	0	276	418	277	2	2,120	5	1	0	0
4:45 PM	0	0	0	0	371	197	0	0	47	338	158	0	251	404	281	1	2,047	3	1	0	0
5:00 PM	0	0	0	0	354	177	0	0	39	303	143	0	246	400	249	0	1,911	3	3	0	0

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Pacific Ave & Lewis River Rd

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	0	0	0	3	2	0	5	0	2	3	5	2	7	5	14	24
3:15 PM	0	0	0	0	5	2	0	7	1	2	1	4	8	16	5	29	40
3:30 PM	0	0	0	0	6	2	0	8	0	3	4	7	1	5	3	9	24
3:45 PM	0	0	0	0	4	1	0	5	0	15	1	16	9	5	1	15	36
4:00 PM	0	0	0	0	0	3	0	3	1	3	1	5	0	2	2	4	12
4:15 PM	0	0	0	0	2	5	0	7	0	0	2	2	2	3	2	7	16
4:30 PM	0	0	0	0	3	1	0	4	0	1	0	1	4	9	1	14	19
4:45 PM	0	0	0	0	2	2	0	4	0	1	0	1	2	3	3	8	13
5:00 PM	0	0	0	0	4	1	0	5	1	0	2	3	1	7	4	12	20
5:15 PM	0	0	0	0	1	2	0	3	1	1	1	3	1	3	3	7	13
5:30 PM	0	0	0	0	2	2	0	4	0	1	2	3	0	3	2	5	12
5:45 PM	0	0	0	0	1	1	0	2	0	2	1	3	0	4	4	8	13
Total Survey	0	0	0	0	33	24	0	57	4	31	18	53	30	67	35	132	242

### Heavy Vehicle Peak Hour Summary 4:00 PM to 5:00 PM

By Approach	Northbound Pacific Ave			Southbound Pacific Ave			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	22	22	18	9	27	9	17	26	33	12	45	60
PHF	0.00			0.23			0.08			0.16			0.15

By Movement	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	7	11	0	18	1	5	3	9	8	17	8	33	60
PHF	0.00	0.00	0.00	0.00	0.12	0.31	0.00	0.23	0.13	0.06	0.09	0.08	0.11	0.15	0.15	0.16	0.15

### Heavy Vehicle Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Pacific Ave				Southbound Pacific Ave				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	0	0	0	18	7	0	25	1	22	9	32	20	33	14	67	124
3:15 PM	0	0	0	0	15	8	0	23	2	23	7	32	18	28	11	57	112
3:30 PM	0	0	0	0	12	11	0	23	1	21	8	30	12	15	8	35	88
3:45 PM	0	0	0	0	9	10	0	19	1	19	4	24	15	19	6	40	83
4:00 PM	0	0	0	0	7	11	0	18	1	5	3	9	8	17	8	33	60
4:15 PM	0	0	0	0	11	9	0	20	1	2	4	7	9	22	10	41	68
4:30 PM	0	0	0	0	10	6	0	16	2	3	3	8	8	22	11	41	65
4:45 PM	0	0	0	0	9	7	0	16	2	3	5	10	4	16	12	32	58
5:00 PM	0	0	0	0	8	6	0	14	2	4	6	12	2	17	13	32	58



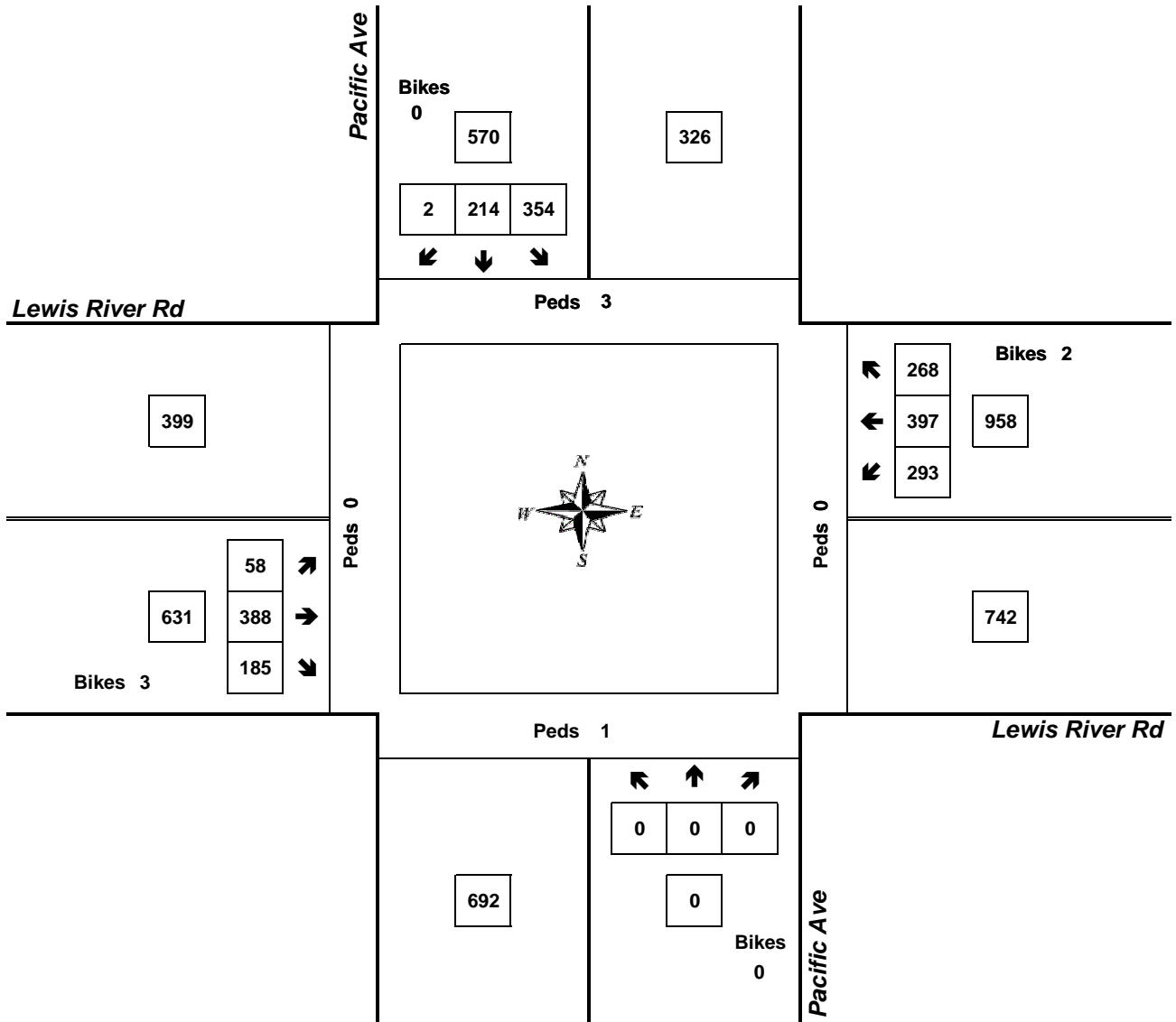
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## Pacific Ave & Lewis River Rd

4:00 PM to 5:00 PM  
Wednesday, May 23, 2018



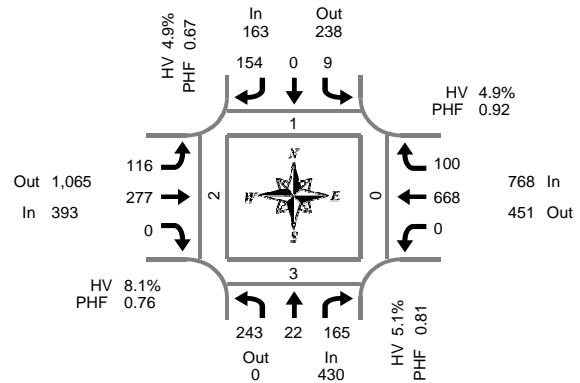
Approach	PHF	HV%	Volume
EB	0.88	1.4%	631
WB	0.90	3.4%	958
NB	0.00	0.0%	0
SB	0.90	3.2%	570
<b>Intersection</b>	<b>0.94</b>	<b>2.8%</b>	<b>2,159</b>

Count Period: 3:00 PM to 6:00 PM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



**Peak Hour Summary**  
7:45 AM to 8:45 AM

## I-5 NB Ramp & Lewis River Rd

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### 15-Minute Interval Summary

7:00 AM to 9:30 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	60	6	50	0	3	0	19	0	29	36	0	0	0	135	27	0	365	0	0	0	0
7:15 AM	56	10	33	0	0	0	18	0	26	37	0	0	0	163	20	0	363	0	0	0	0
7:30 AM	65	6	51	0	0	0	22	0	28	42	0	0	0	158	33	0	405	0	0	0	0
7:45 AM	79	10	44	0	2	0	22	0	21	55	0	0	0	154	23	0	410	0	0	0	0
8:00 AM	64	4	38	0	2	0	25	0	26	58	0	0	0	174	35	0	426	1	1	0	1
8:15 AM	50	3	40	0	1	0	60	0	35	69	0	0	0	158	19	2	435	0	2	0	1
8:30 AM	50	5	43	0	4	0	47	0	34	95	0	0	0	182	23	0	483	0	0	0	0
8:45 AM	59	11	46	0	4	0	24	0	34	69	0	0	0	130	25	0	402	0	0	0	1
9:00 AM	37	10	40	0	2	0	20	0	35	68	0	0	0	112	20	0	344	1	0	0	0
9:15 AM	44	9	49	0	2	0	23	0	23	47	0	0	0	96	25	0	318	1	1	0	0
Total Survey	564	74	434	0	20	0	280	0	291	576	0	0	0	1,462	250	2	3,951	3	4	0	3

### Peak Hour Summary

7:45 AM to 8:45 AM

By Approach	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	430	0	430	0	163	238	401	0	393	1,065	1,458	0	768	451	1,219	2	1,754	1	3	0	2
%HV	5.1%				4.9%				8.1%				4.9%				5.7%				
PHF	0.81				0.67				0.76				0.92				0.91				

By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	243	22	165	430	9	0	154	163	116	277	0	393	0	668	100	768	1,754
%HV	6.2%	4.5%	3.6%	5.1%	11.1%	0.0%	4.5%	4.9%	8.6%	7.9%	0.0%	8.1%	0.0%	4.5%	8.0%	4.9%	5.7%
PHF	0.77	0.55	0.94	0.81	0.56	0.00	0.64	0.67	0.83	0.73	0.00	0.76	0.00	0.92	0.71	0.92	0.91

### Rolling Hour Summary

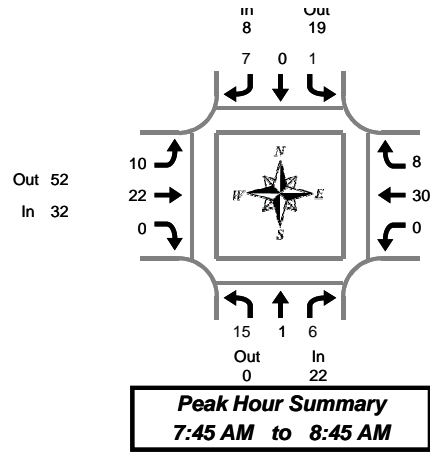
7:00 AM to 9:30 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	260	32	178	0	5	0	81	0	104	170	0	0	0	610	103	0	1,543	0	0	0	0
7:15 AM	264	30	166	0	4	0	87	0	101	192	0	0	0	649	111	0	1,604	1	1	0	1
7:30 AM	258	23	173	0	5	0	129	0	110	224	0	0	0	644	110	2	1,676	1	3	0	2
7:45 AM	243	22	165	0	9	0	154	0	116	277	0	0	0	668	100	2	1,754	1	3	0	2
8:00 AM	223	23	167	0	11	0	156	0	129	291	0	0	0	644	102	2	1,746	1	3	0	3
8:15 AM	196	29	169	0	11	0	151	0	138	301	0	0	0	582	87	2	1,664	1	2	0	2
8:30 AM	190	35	178	0	12	0	114	0	126	279	0	0	0	520	93	0	1,547	2	1	0	1

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## I-5 NB Ramp & Lewis River Rd

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	8	1	3	12	1	0	1	2	3	9	0	12	0	5	2	7	33
7:15 AM	2	2	3	7	0	0	1	1	2	6	0	8	0	4	3	7	23
7:30 AM	3	1	4	8	0	0	0	0	1	5	0	6	0	1	4	5	19
7:45 AM	3	0	1	4	0	0	0	0	4	7	0	11	0	8	3	11	26
8:00 AM	4	0	1	5	1	0	1	2	4	3	0	7	0	4	4	8	22
8:15 AM	5	1	2	8	0	0	5	5	0	4	0	4	0	12	1	13	30
8:30 AM	3	0	2	5	0	0	1	1	2	8	0	10	0	6	0	6	22
8:45 AM	4	1	1	6	0	0	2	2	1	6	0	7	0	3	1	4	19
9:00 AM	7	2	3	12	0	0	3	3	0	2	0	2	0	1	2	3	20
9:15 AM	8	2	2	12	0	0	3	3	1	4	0	5	0	1	3	4	24
Total Survey	47	10	22	79	2	0	17	19	18	54	0	72	0	45	23	68	238

### Heavy Vehicle Peak Hour Summary 7:45 AM to 8:45 AM

By Approach	Northbound I-5 NB Ramp			Southbound I-5 NB Ramp			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	22	0	22	8	19	27	32	52	84	38	29	67	100
PHF	0.18			0.25			0.31			0.30			0.32

By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	15	1	6	22	1	0	7	8	10	22	0	32	0	30	8	38	100
PHF	0.20	0.05	0.15	0.18	0.25	0.00	0.22	0.25	0.28	0.28	0.00	0.31	0.00	0.31	0.18	0.30	0.32

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	16	4	11	31	1	0	2	3	10	27	0	37	0	18	12	30	101
7:15 AM	12	3	9	24	1	0	2	3	11	21	0	32	0	17	14	31	90
7:30 AM	15	2	8	25	1	0	6	7	9	19	0	28	0	25	12	37	97
7:45 AM	15	1	6	22	1	0	7	8	10	22	0	32	0	30	8	38	100
8:00 AM	16	2	6	24	1	0	9	10	7	21	0	28	0	25	6	31	93
8:15 AM	19	4	8	31	0	0	11	11	3	20	0	23	0	22	4	26	91
8:30 AM	22	5	8	35	0	0	9	9	4	20	0	24	0	11	6	17	85

# Peak Hour Summary

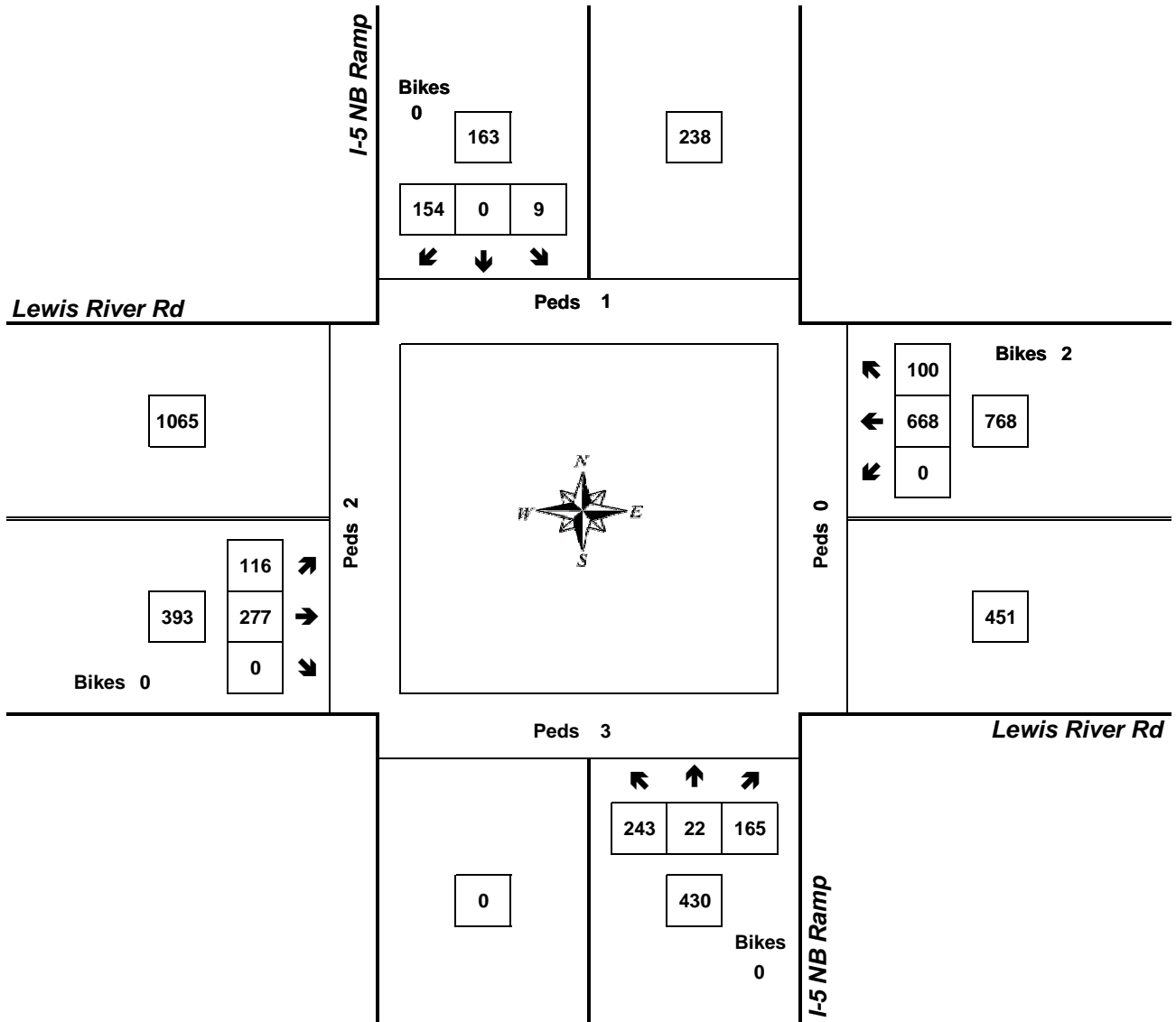


Clay Carney  
(503) 833-2740

## I-5 NB Ramp & Lewis River Rd

7:45 AM to 8:45 AM

Thursday, May 24, 2018



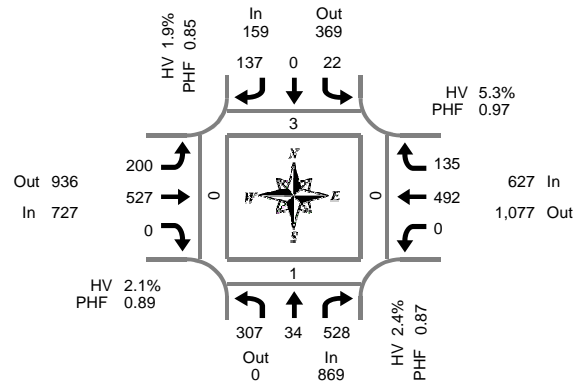
Approach	PHF	HV%	Volume
EB	0.76	8.1%	393
WB	0.92	4.9%	768
NB	0.81	5.1%	430
SB	0.67	4.9%	163
<b>Intersection</b>	<b>0.91</b>	<b>5.7%</b>	<b>1,754</b>

Count Period: 7:00 AM to 9:30 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



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

## I-5 NB Ramp & Lewis River Rd

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### 15-Minute Interval Summary

3:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	58	11	83	0	6	0	44	0	56	89	0	0	0	140	24	0	511	1	2	0	1
3:15 PM	71	7	104	0	4	0	34	0	45	119	0	0	0	140	27	0	551	2	0	0	0
3:30 PM	59	10	95	0	5	0	36	0	44	188	0	0	0	127	26	0	590	0	0	0	0
3:45 PM	88	11	139	0	5	0	25	0	55	128	0	0	0	104	31	0	586	7	6	0	1
4:00 PM	69	12	120	0	12	0	32	0	46	159	0	0	0	108	47	0	605	1	0	0	0
4:15 PM	64	10	123	0	7	0	40	0	54	129	0	0	0	135	19	0	581	2	0	0	0
4:30 PM	78	10	134	0	2	0	33	0	50	108	0	0	0	125	37	0	577	0	0	0	0
4:45 PM	96	2	151	0	1	0	32	0	50	131	0	0	0	124	32	0	619	0	1	0	0
5:00 PM	75	5	101	0	5	0	31	0	72	141	0	0	0	118	30	0	578	0	0	0	0
5:15 PM	85	17	142	0	4	0	25	0	42	133	0	0	0	127	30	0	605	3	0	0	0
5:30 PM	84	8	140	0	2	0	27	0	46	99	0	0	0	96	24	0	526	0	1	0	0
5:45 PM	68	12	130	0	6	0	32	0	50	99	0	0	0	121	27	0	545	0	2	0	0
Total Survey	895	115	1,462	0	59	0	391	0	610	1,523	0	0	0	1,465	354	0	6,874	16	12	0	2

### Peak Hour Summary

4:00 PM to 5:00 PM

By Approach	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total	Pedestrians Crosswalks			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	869	0	869	0	159	369	528	0	727	936	1,663	0	627	1,077	1,704	0	2,382	3	1	0	0
%HV	2.4%				1.9%				2.1%				5.3%				3.0%				
PHF	0.87				0.85				0.89				0.97				0.96				

By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	307	34	528	869	22	0	137	159	200	527	0	727	0	492	135	627	2,382
%HV	3.6%	5.9%	1.5%	2.4%	4.5%	0.0%	1.5%	1.9%	4.0%	1.3%	0.0%	2.1%	0.0%	4.7%	7.4%	5.3%	3.0%
PHF	0.80	0.71	0.87	0.87	0.46	0.00	0.86	0.85	0.93	0.83	0.00	0.89	0.00	0.91	0.72	0.97	0.96

### Rolling Hour Summary

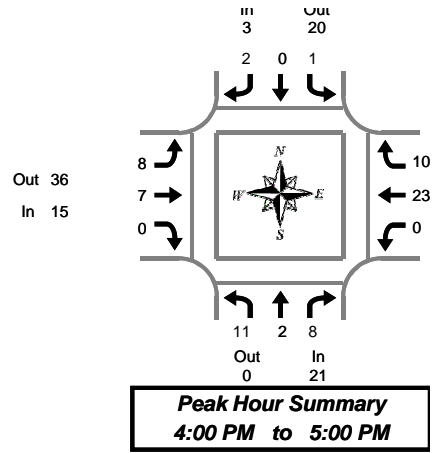
3:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	276	39	421	0	20	0	139	0	200	524	0	0	0	511	108	0	2,238	10	8	0	2
3:15 PM	287	40	458	0	26	0	127	0	190	594	0	0	0	479	131	0	2,332	10	6	0	1
3:30 PM	280	43	477	0	29	0	133	0	199	604	0	0	0	474	123	0	2,362	10	6	0	1
3:45 PM	299	43	516	0	26	0	130	0	205	524	0	0	0	472	134	0	2,349	10	6	0	1
4:00 PM	307	34	528	0	22	0	137	0	200	527	0	0	0	492	135	0	2,382	3	1	0	0
4:15 PM	313	27	509	0	15	0	136	0	226	509	0	0	0	502	118	0	2,355	2	1	0	0
4:30 PM	334	34	528	0	12	0	121	0	214	513	0	0	0	494	129	0	2,379	3	1	0	0
4:45 PM	340	32	534	0	12	0	115	0	210	504	0	0	0	465	116	0	2,328	3	2	0	0
5:00 PM	312	42	513	0	17	0	115	0	210	472	0	0	0	462	111	0	2,254	3	3	0	0

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## I-5 NB Ramp & Lewis River Rd

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	3	4	4	11	0	0	7	7	5	2	0	7	0	3	1	4	29
3:15 PM	12	2	1	15	0	0	8	8	3	5	0	8	0	10	2	12	43
3:30 PM	3	1	0	4	0	0	3	3	2	6	0	8	0	2	3	5	20
3:45 PM	9	2	4	15	0	0	4	4	3	16	0	19	0	4	0	4	42
4:00 PM	3	0	3	6	1	0	1	2	2	2	0	4	0	3	4	7	19
4:15 PM	3	1	2	6	0	0	0	0	1	2	0	3	0	3	1	4	13
4:30 PM	4	1	2	7	0	0	1	1	3	1	0	4	0	12	5	17	29
4:45 PM	1	0	1	2	0	0	0	0	2	2	0	4	0	5	0	5	11
5:00 PM	4	0	2	6	0	0	0	0	0	3	0	3	0	7	0	7	16
5:15 PM	3	0	1	4	0	0	0	0	1	1	0	2	0	2	2	4	10
5:30 PM	3	1	3	7	0	0	2	2	3	1	0	4	0	1	0	1	14
5:45 PM	6	1	5	12	0	0	0	0	1	2	0	3	0	4	2	6	21
Total Survey	54	13	28	95	1	0	26	27	26	43	0	69	0	56	20	76	267

### Heavy Vehicle Peak Hour Summary 4:00 PM to 5:00 PM

By Approach	Northbound I-5 NB Ramp			Southbound I-5 NB Ramp			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	21	0	21	3	20	23	15	36	51	33	16	49	72
PHF	0.15			0.04			0.11			0.28			0.17

By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	11	2	8	21	1	0	2	3	8	7	0	15	0	23	10	33	72
PHF	0.11	0.07	0.22	0.15	0.25	0.00	0.03	0.04	0.20	0.06	0.00	0.11	0.00	0.24	0.25	0.28	0.17

### Heavy Vehicle Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	27	9	9	45	0	0	22	22	13	29	0	42	0	19	6	25	134
3:15 PM	27	5	8	40	1	0	16	17	10	29	0	39	0	19	9	28	124
3:30 PM	18	4	9	31	1	0	8	9	8	26	0	34	0	12	8	20	94
3:45 PM	19	4	11	34	1	0	6	7	9	21	0	30	0	22	10	32	103
4:00 PM	11	2	8	21	1	0	2	3	8	7	0	15	0	23	10	33	72
4:15 PM	12	2	7	21	0	0	1	1	6	8	0	14	0	27	6	33	69
4:30 PM	12	1	6	19	0	0	1	1	6	7	0	13	0	26	7	33	66
4:45 PM	11	1	7	19	0	0	2	2	6	7	0	13	0	15	2	17	51
5:00 PM	16	2	11	29	0	0	2	2	5	7	0	12	0	14	4	18	61

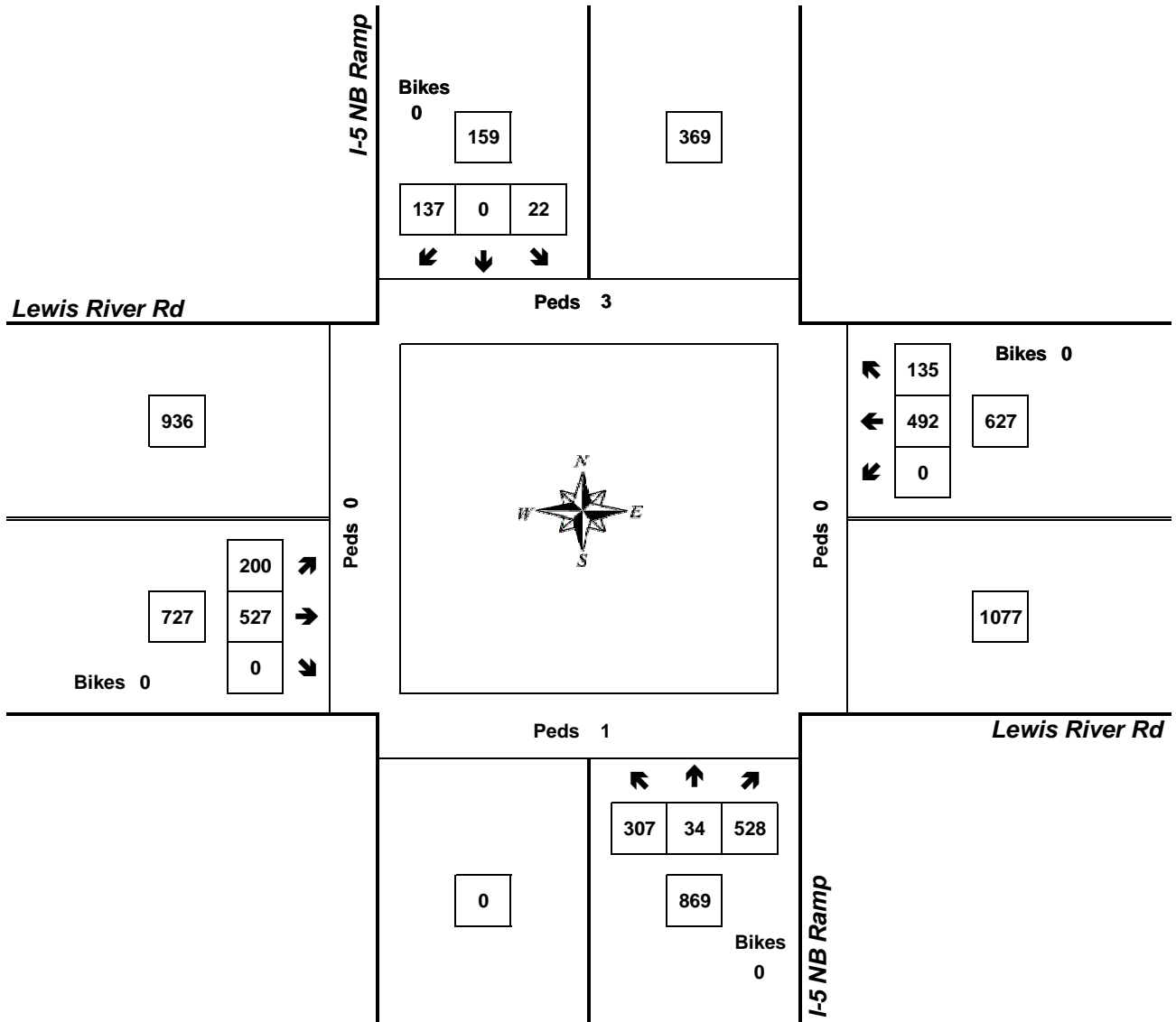
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## I-5 NB Ramp & Lewis River Rd

4:00 PM to 5:00 PM  
Wednesday, May 23, 2018



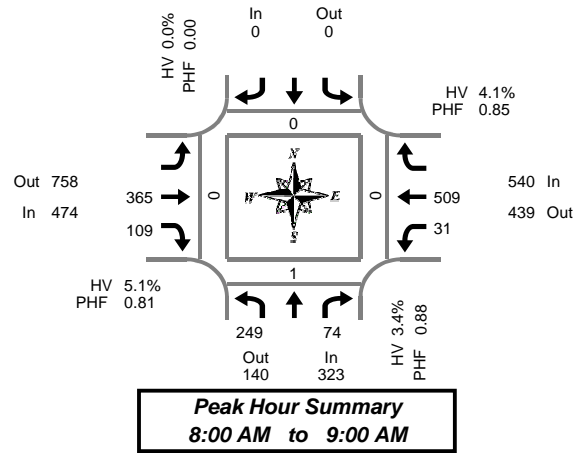
Approach	PHF	HV%	Volume
EB	0.89	2.1%	727
WB	0.97	5.3%	627
NB	0.87	2.4%	869
SB	0.85	1.9%	159
<b>Intersection</b>	<b>0.96</b>	<b>3.0%</b>	<b>2,382</b>

Count Period: 3:00 PM to 6:00 PM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## E Cc St & Lewis River Rd

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	R	Bikes		In	Out	Total	Bikes	T	R	Bikes	L	T	Bikes	North	South		East	West		
7:00 AM	72	3	0					0	61	26	0	6	96	0	0	0	0	0			
7:15 AM	77	14	0					0	41	20	0	4	97	0	0	0	0	0			
7:30 AM	74	15	0					0	83	12	0	4	117	0	0	0	0	0			
7:45 AM	78	18	0					0	74	20	0	1	106	0	0	0	0	0			
8:00 AM	70	22	0					0	80	19	0	4	137	0	0	0	0	0			
8:15 AM	66	21	0					0	88	22	0	7	122	0	1	0	0	0			
8:30 AM	56	11	0					0	110	37	0	13	145	0	0	0	0	0			
8:45 AM	57	20	0					0	87	31	0	7	105	0	0	0	0	0			
9:00 AM	43	14	0					0	75	32	0	5	86	0	0	0	0	0			
9:15 AM	38	19	0					0	78	28	0	11	77	0	0	0	0	0			
Total Survey	631	157	0					0	777	247	0	62	1,088	0	0	1	0	0			

### Peak Hour Summary 8:00 AM to 9:00 AM

By Approach	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	323	140	463	0	0	0	0	0	474	758	1,232	0	540	439	979	0	0	1	0	0	
%HV	3.4%				0.0%				5.1%				4.1%				4.3%				
PHF	0.88				0.00				0.81				0.85				0.90				

By Movement	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	R	Total	Bikes			Total	Bikes	T	R	Total	Bikes	L	T	Total	Bikes	
Volume	249	74	323	0			0	0	365	109	474	0	31	509	540	0	
%HV	4.4%	NA	0.0%	3.4%	NA	NA	0.0%	0.0%	NA	4.4%	7.3%	5.1%	3.2%	4.1%	NA	4.1%	
PHF	0.89	0.84	0.88				0.00		0.83	0.74	0.81		0.60	0.88	0.85	0.90	

### Rolling Hour Summary 7:00 AM to 9:30 AM

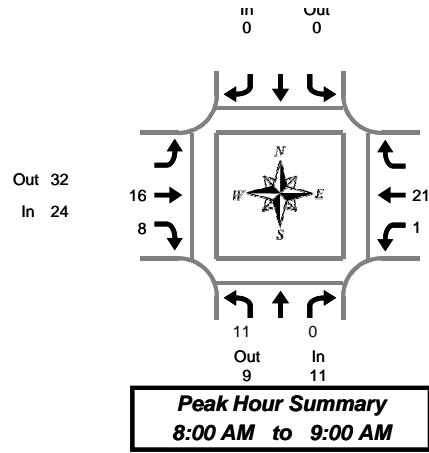
Interval Start Time	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	R	Bikes				Total	Bikes	T	R	Bikes	L	T	Bikes	North	South		East	West		
7:00 AM	301	50	0				0	0	259	78	0	15	416	0	0	0	0	0			
7:15 AM	299	69	0				0	0	278	71	0	13	457	0	0	0	0	0			
7:30 AM	288	76	0				0	0	325	73	0	16	482	0	1	0	0	0			
7:45 AM	270	72	0				0	0	352	98	0	25	510	0	1	0	0	0			
8:00 AM	249	74	0				0	0	365	109	0	31	509	0	1	0	0	0			
8:15 AM	222	66	0				0	0	360	122	0	32	458	0	1	0	0	0			
8:30 AM	194	64	0				0	0	350	128	0	36	413	0	0	0	0	0			



# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## E Cc St & Lewis River Rd

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	3	0	3			0	5	6	11	0	4	4	18
7:15 AM	3	1	4			0	3	6	9	1	3	4	17
7:30 AM	4	3	7			0	7	1	8	0	1	1	16
7:45 AM	5	3	8			0	5	3	8	0	5	5	21
8:00 AM	4	0	4			0	4	1	5	0	5	5	14
8:15 AM	3	0	3			0	2	3	5	1	10	11	19
8:30 AM	1	0	1			0	5	3	8	0	6	6	15
8:45 AM	3	0	3			0	5	1	6	0	0	0	9
9:00 AM	1	0	1			0	4	2	6	0	2	2	9
9:15 AM	3	1	4			0	2	4	6	1	1	2	12
Total Survey	30	8	38			0	42	30	72	3	37	40	150

### Heavy Vehicle Peak Hour Summary 8:00 AM to 9:00 AM

By Approach	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	11	9	20	0	0	0	24	32	56	22	16	38	57
PHF	0.14			0.00			0.21			0.25			0.26

By Movement	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	L	R	Total			Total	T	R	Total	L	T	Total	
Volume	11	0	11			0	16	8	24	1	21	22	57
PHF	0.21	0.00	0.14			0.00	0.25	0.15	0.21	0.25	0.25	0.25	0.26

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	15	7	22			0	20	16	36	1	13	14	72
7:15 AM	16	7	23			0	19	11	30	1	14	15	68
7:30 AM	16	6	22			0	18	8	26	1	21	22	70
7:45 AM	13	3	16			0	16	10	26	1	26	27	69
8:00 AM	11	0	11			0	16	8	24	1	21	22	57
8:15 AM	8	0	8			0	16	9	25	1	18	19	52
8:30 AM	8	1	9			0	16	10	26	1	9	10	45

# Peak Hour Summary



Clay Carney  
(503) 833-2740

## E Cc St & Lewis River Rd

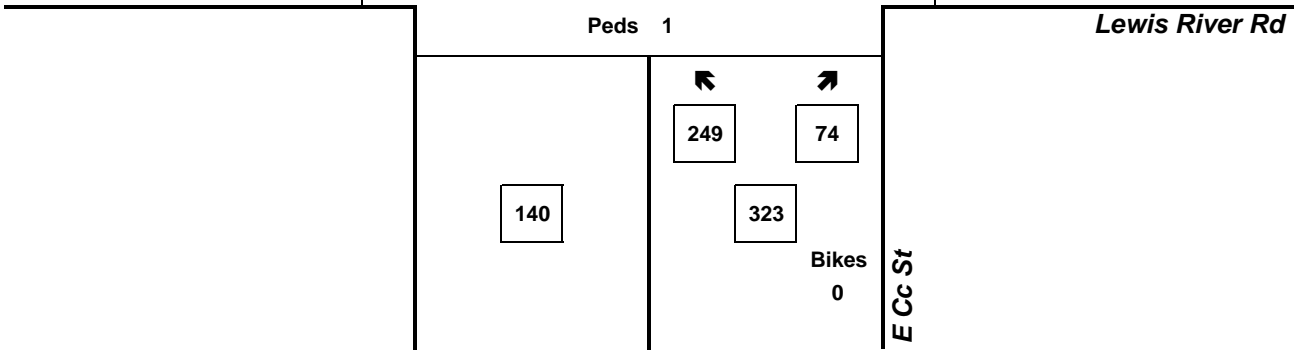
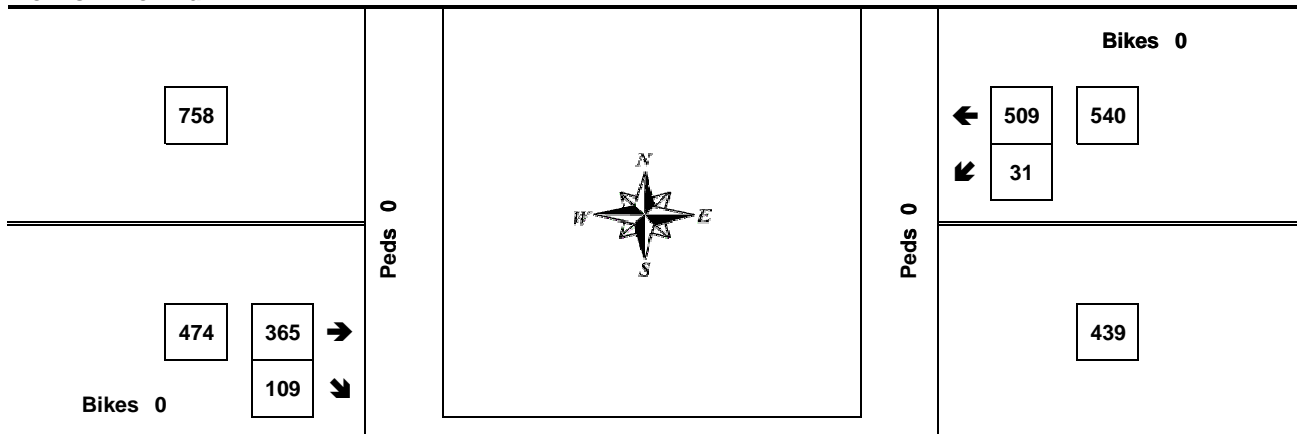
8:00 AM to 9:00 AM

Thursday, May 24, 2018

Bikes  
0

Lewis River Rd

Peds 0



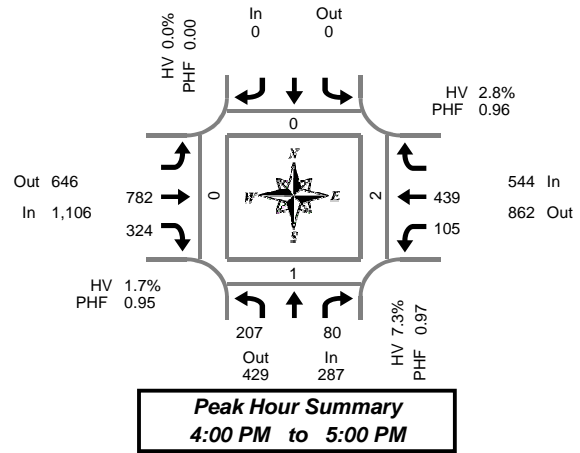
Approach	PHF	HV%	Volume
EB	0.81	5.1%	474
WB	0.85	4.1%	540
NB	0.88	3.4%	323
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.90</b>	<b>4.3%</b>	<b>1,337</b>

Count Period: 7:00 AM to 9:30 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## E Cc St & Lewis River Rd

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	R	Bikes				Bikes		T	R	Bikes		L	T	Bikes			North	South	East	West
3:00 PM	54	10	0				0	127	52	0	20	112	0	0	0	375	0	1	0	0	
3:15 PM	50	22	0				0	158	66	0	18	116	0	0	0	430	0	0	0	0	
3:30 PM	44	8	0				0	206	90	0	22	97	0	0	0	467	0	0	0	0	
3:45 PM	53	25	0				0	195	76	0	19	87	0	0	0	455	0	1	1	0	
4:00 PM	50	18	0				0	203	89	0	26	106	0	0	0	492	0	0	0	0	
4:15 PM	46	25	0				0	189	81	0	31	106	0	0	0	478	0	0	2	0	
4:30 PM	58	16	0				0	184	73	0	28	106	0	0	0	465	0	0	0	0	
4:45 PM	53	21	0				0	206	81	0	20	121	0	0	0	502	0	1	0	0	
5:00 PM	49	26	0				0	169	67	0	18	94	0	0	0	423	0	0	0	0	
5:15 PM	52	26	0				0	196	88	0	27	106	0	0	0	495	0	0	0	0	
5:30 PM	36	19	0				0	170	69	0	28	78	0	0	0	400	0	0	1	0	
5:45 PM	46	23	0				0	156	72	0	24	100	0	0	0	421	0	0	0	0	
Total Survey	591	239	0				0	2,159	904	0	281	1,229	0	0	0	5,403	0	3	4	0	

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

By Approach	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total	Pedestrians Crosswalk				
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West	
Volume	287	429	716	0	0	0	0	0	1,106	646	1,752	0	544	862	1,406	0	1,937	0	1	2	0	
%HV	7.3%				0.0%				1.7%				2.8%				2.8%	0	0	0	0	0
PHF	0.97				0.00				0.95				0.96				0.96	0	0	0	0	0

By Movement	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Total
	L	R	Total	Bikes			Total	Bikes	T	R	Total	Bikes	L	T	Total	Bikes	
Volume	207	80	287	0			0	0	782	324	1,106	0	105	439	544	1,937	
%HV	8.7%	NA	3.8%	7.3%	NA	NA	NA	0.0%	NA	1.2%	3.1%	1.7%	2.9%	2.7%	NA	2.8%	2.8%
PHF	0.89		0.80	0.97			0.00		0.95	0.91	0.95		0.85	0.91	0.96	0.96	

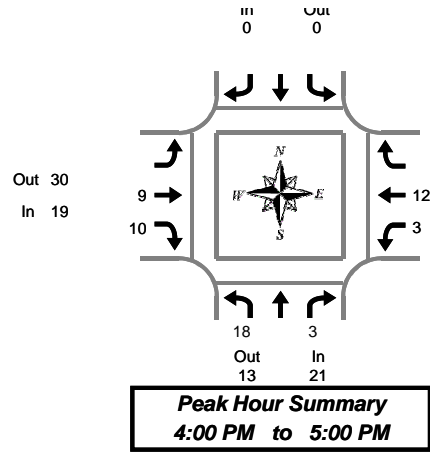
### Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound E Cc St				Southbound E Cc St				Eastbound Lewis River Rd				Westbound Lewis River Rd				Interval Total	Pedestrians Crosswalk			
	L	R	Bikes				Bikes		T	R	Bikes		L	T	Bikes			North	South	East	West
3:00 PM	201	65	0				0	686	284	0	79	412	0	0	1,727	0	2	1	0		
3:15 PM	197	73	0				0	762	321	0	85	406	0	0	1,844	0	1	1	0		
3:30 PM	193	76	0				0	793	336	0	98	396	0	0	1,892	0	1	3	0		
3:45 PM	207	84	0				0	771	319	0	104	405	0	0	1,890	0	1	3	0		
4:00 PM	207	80	0				0	782	324	0	105	439	0	0	1,937	0	1	2	0		
4:15 PM	206	88	0				0	748	302	0	97	427	0	0	1,868	0	1	2	0		
4:30 PM	212	89	0				0	755	309	0	93	427	0	0	1,885	0	1	0	0		
4:45 PM	190	92	0				0	741	305	0	93	399	0	0	1,820	0	1	1	0		
5:00 PM	183	94	0				0	691	296	0	97	378	0	0	1,739	0	0	1	0		

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## E Cc St & Lewis River Rd

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
3:00 PM	3	0	3			0	4	2	6	0	2	2	11
3:15 PM	3	0	3			0	4	2	6	0	8	8	17
3:30 PM	4	0	4			0	5	2	7	0	2	2	13
3:45 PM	1	1	2			0	14	4	18	3	4	7	27
4:00 PM	5	1	6			0	3	3	6	2	2	4	16
4:15 PM	3	2	5			0	3	1	4	1	3	4	13
4:30 PM	7	0	7			0	3	3	6	0	4	4	17
4:45 PM	3	0	3			0	0	3	3	0	3	3	9
5:00 PM	2	0	2			0	2	2	4	1	5	6	12
5:15 PM	2	0	2			0	1	1	2	0	2	2	6
5:30 PM	0	0	0			0	2	2	4	0	1	1	5
5:45 PM	5	0	5			0	4	3	7	0	0	0	12
Total Survey	38	4	42			0	45	28	73	7	36	43	158

### Heavy Vehicle Peak Hour Summary 4:00 PM to 5:00 PM

By Approach	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	21	13	34	0	0	0	19	30	49	15	12	27	55
PHF	0.29			0.00			0.15			0.22			0.24

By Movement	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Total
	L	R	Total			Total	T	R	Total	L	T	Total	
Volume	18	3	21			0	9	10	19	3	12	15	55
PHF	0.30	0.19	0.29			0.00	0.10	0.28	0.15	0.13	0.21	0.22	0.24

### Heavy Vehicle Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound E Cc St			Southbound E Cc St			Eastbound Lewis River Rd			Westbound Lewis River Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
3:00 PM	11	1	12			0	27	10	37	3	16	19	68
3:15 PM	13	2	15			0	26	11	37	5	16	21	73
3:30 PM	13	4	17			0	25	10	35	6	11	17	69
3:45 PM	16	4	20			0	23	11	34	6	13	19	73
4:00 PM	18	3	21			0	9	10	19	3	12	15	55
4:15 PM	15	2	17			0	8	9	17	2	15	17	51
4:30 PM	14	0	14			0	6	9	15	1	14	15	44
4:45 PM	7	0	7			0	5	8	13	1	11	12	32
5:00 PM	9	0	9			0	9	8	17	1	8	9	35

# Peak Hour Summary



Clay Carney  
(503) 833-2740

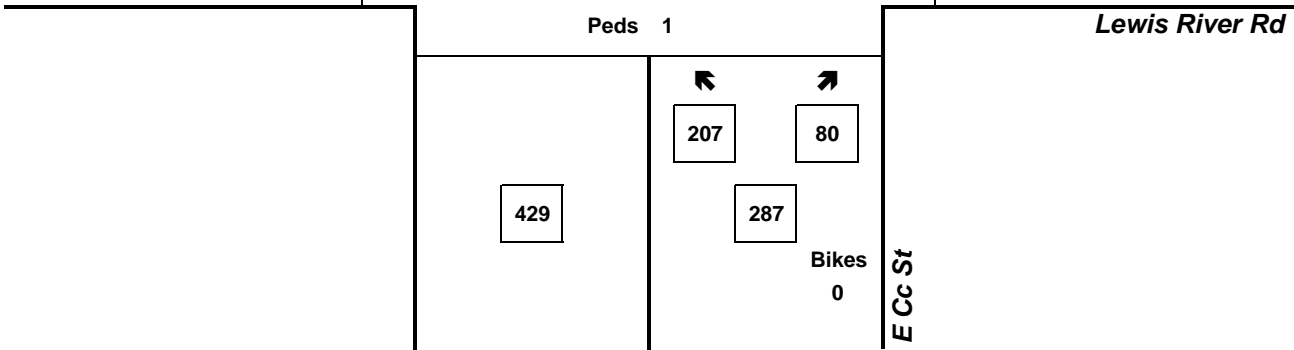
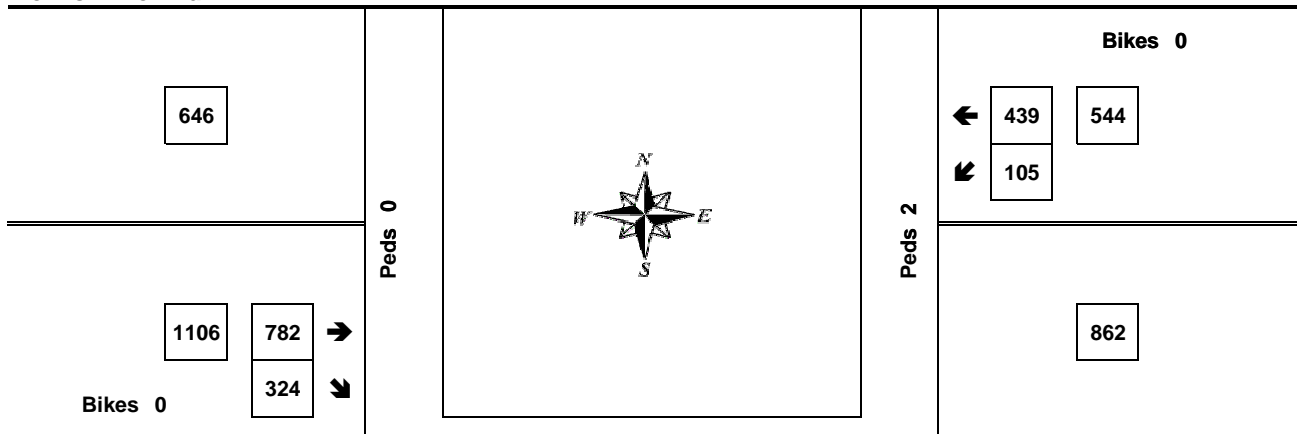
## E Cc St & Lewis River Rd

4:00 PM to 5:00 PM  
Wednesday, May 23, 2018

Bikes  
0

Lewis River Rd

Peds 0



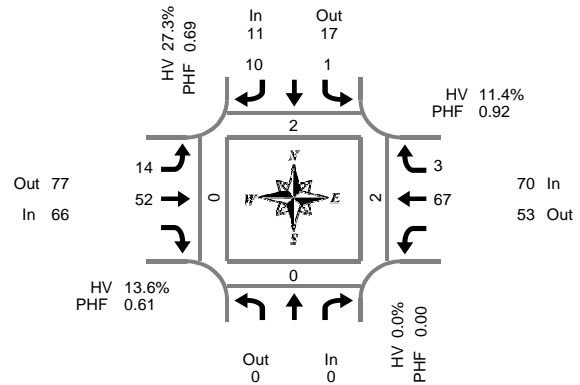
Approach	PHF	HV%	Volume
EB	0.95	1.7%	1,106
WB	0.96	2.8%	544
NB	0.97	7.3%	287
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.96</b>	<b>2.8%</b>	<b>1,937</b>

Count Period: 3:00 PM to 6:00 PM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## Park And Ride & Lakeshore Dr

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	L	T	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
7:00 AM				0	0	0	0	0	6	21		0	19	0	0	0	50	1	0	1	0
7:15 AM				0	1	2	0	2	9		0	18	1	0	0	33	0	0	0	0	
7:30 AM				0	0	2	0	3	11		0	15	1	0	0	32	0	0	0	0	
7:45 AM				0	0	2	0	3	11		0	15	1	1	0	32	1	0	1	0	
8:00 AM				0	1	4	0	1	11		0	16	0	0	0	33	0	0	0	0	
8:15 AM				0	0	3	0	3	21		0	13	0	0	0	40	0	0	0	0	
8:30 AM				0	0	0	0	0	21		0	12	0	0	0	33	0	0	0	0	
8:45 AM				0	0	0	0	2	11		0	20	0	0	0	33	0	0	0	0	
9:00 AM				0	0	4	0	3	11		0	10	0	0	0	28	0	0	0	0	
9:15 AM				0	0	1	0	1	12		1	17	1	0	0	32	0	0	0	0	
Total Survey				0	2	22	0	24	139		1	155	4	1	0	346	2	0	2	0	

### Peak Hour Summary 7:00 AM to 8:00 AM

By Approach	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	11	17	28	0	66	77	143	0	70	53	123	1	147	2	0	2	0
%HV	0.0%				27.3%				13.6%				11.4%				13.6%				
PHF	0.00				0.69				0.61				0.92				0.74				

By Movement	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Total		
	Total	L	R	Total	L	T	Total	L	T	Total	T	R	Total						
Volume	0	1		10	11	14	52		66	67	3	70		147					
%HV	NA	NA	NA	0.0%	0.0%	NA	30.0%	27.3%	28.6%	9.6%	NA	13.6%	NA	11.9%	0.0%	11.4%	13.6%		
PHF				0.00	0.25		0.63	0.69	0.58	0.62		0.61	NA	0.88	0.75	0.92			

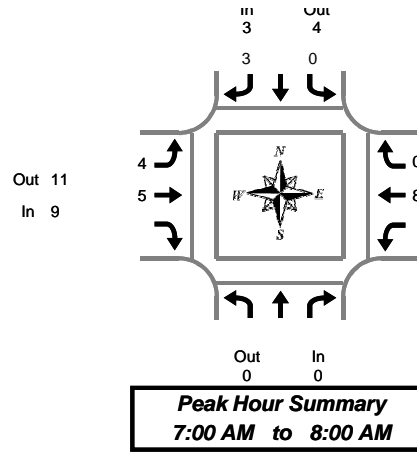
### Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	L	T	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
7:00 AM				0	1	10	0	14	52		0	67	3	1	147	2	0	2	0		
7:15 AM				0	2	10	0	9	42		0	64	3	1	130	1	0	1	0		
7:30 AM				0	1	11	0	10	54		0	59	2	1	137	1	0	1	0		
7:45 AM				0	1	9	0	7	64		0	56	1	1	138	1	0	1	0		
8:00 AM				0	1	7	0	6	64		0	61	0	0	139	0	0	0	0		
8:15 AM				0	0	7	0	8	64		0	55	0	0	134	0	0	0	0		
8:30 AM				0	0	5	0	6	55		1	59	1	0	126	0	0	0	0		

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Park And Ride & Lakeshore Dr

Thursday, May 24, 2018  
7:00 AM to 9:30 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Interval Total
	Total	L	R	Total	L	R	Total	L	T	Total	T	R	
7:00 AM	0	0	0	3	3	3	3	5	8	2	0	2	13
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	2
7:45 AM	0	0	0	0	0	0	1	0	1	3	0	3	4
8:00 AM	0	0	0	1	1	0	1	1	1	1	0	1	3
8:15 AM	0	0	0	0	0	0	0	1	1	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	3	3	1	0	1	4
8:45 AM	0	0	0	0	0	0	1	1	1	1	0	1	2
9:00 AM	0	0	0	1	1	1	2	2	3	1	0	1	5
9:15 AM	0	0	0	0	0	0	0	2	2	1	0	1	3
Total Survey	0	0	0	5	5	5	15	20	20	13	0	13	38

### Heavy Vehicle Peak Hour Summary 7:00 AM to 8:00 AM

By Approach	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	4	7	9	11	20	8	5	13	20
PHF	0.00			0.25			0.28			0.33			0.31

By Movement	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Total
	Total	L	R	Total	L	T	Total	L	T	Total	T	R	
Volume	0	0	0	3	3	4	5	9	8	0	8	20	
PHF	0.00	0.00		0.25	0.25	0.33	0.21	0.28	0.33	0.00	0.33	0.31	

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:30 AM

Interval Start Time	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Interval Total
	Total	L	R	Total	L	T	Total	L	T	Total	T	R	
7:00 AM	0	0	0	3	3	4	5	9	8	0	8	20	
7:15 AM	0	0	0	1	1	1	1	2	7	0	7	10	
7:30 AM	0	0	0	1	1	1	2	3	6	0	6	10	
7:45 AM	0	0	0	1	1	1	5	6	5	0	5	12	
8:00 AM	0	0	0	1	1	0	6	6	3	0	3	10	
8:15 AM	0	0	0	1	1	1	7	8	3	0	3	12	
8:30 AM	0	0	0	1	1	1	8	9	4	0	4	14	

# Peak Hour Summary

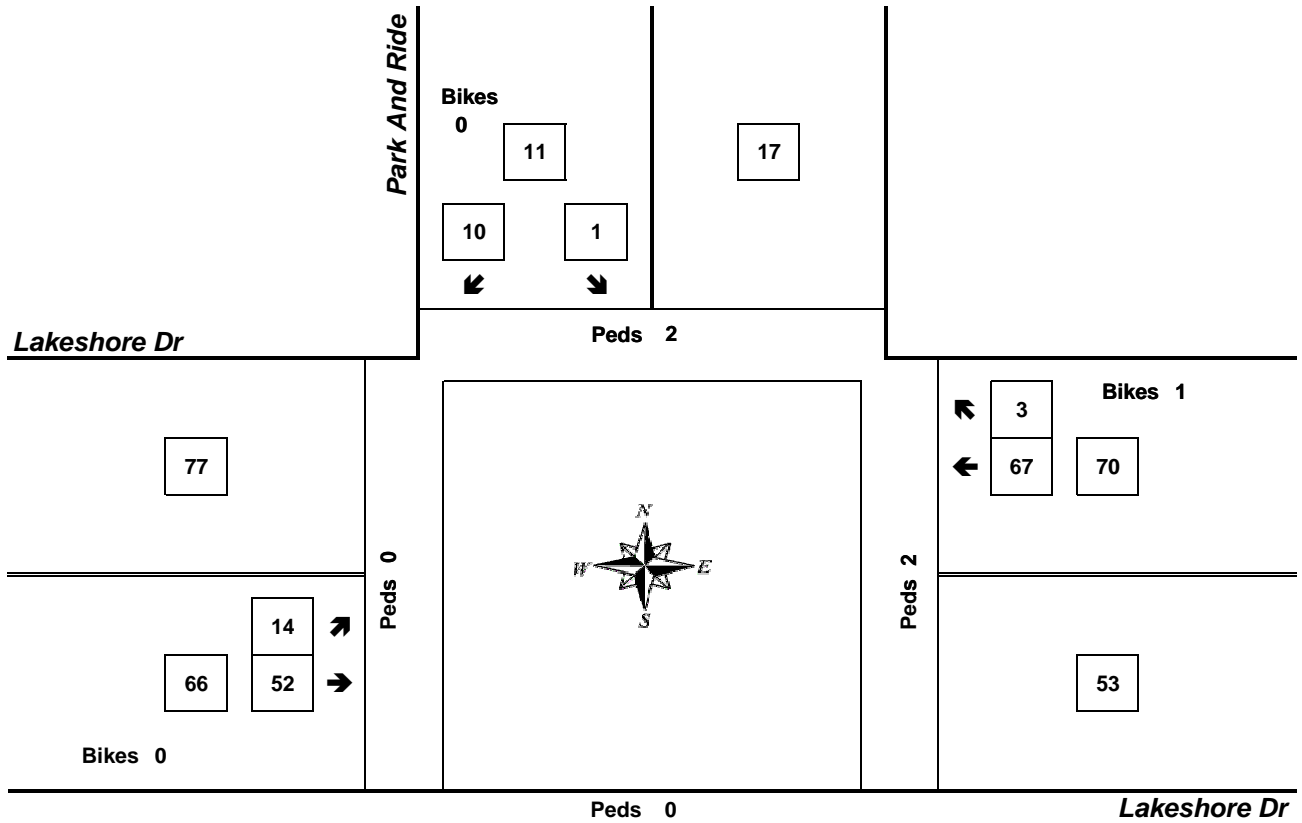


Clay Carney  
(503) 833-2740

## Park And Ride & Lakeshore Dr

7:00 AM to 8:00 AM

Thursday, May 24, 2018



Approach	PHF	HV%	Volume
EB	0.61	13.6%	66
WB	0.92	11.4%	70
NB	0.00	0.0%	0
SB	0.69	27.3%	11
<b>Intersection</b>	<b>0.74</b>	<b>13.6%</b>	<b>147</b>

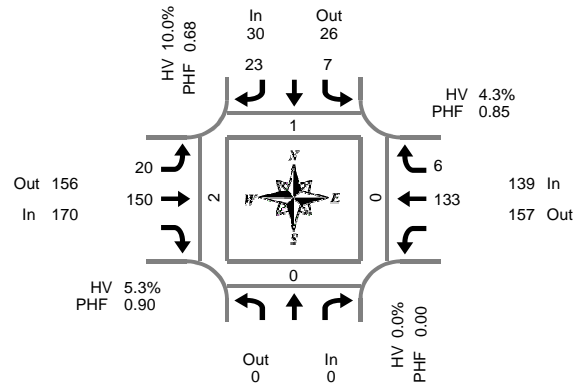
Count Period: 7:00 AM to 9:30 AM



# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## Park And Ride & Lakeshore Dr

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

**Peak Hour Summary**  
4:45 PM to 5:45 PM

### 15-Minute Interval Summary

3:00 PM to 6:00 PM

Interval Start Time	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Interval Total	Pedestrians Crosswalk			
	In	Out	Bikes	Total	L	R	Bikes	Total	L	T	Bikes	Total	T	R	Bikes	Total		North	South	East	West
3:00 PM			0	0	0	7	0	7	3	20	0	23	29	0	0	29	0	0	0	0	
3:15 PM			0	0	2	0	2	0	0	29	0	29	25	0	0	25	0	0	0	1	
3:30 PM			0	1	5	0	5	4	20	0	24	30	0	0	30	0	0	0	0		
3:45 PM			0	2	6	0	6	6	13	0	19	28	2	0	30	0	0	0	0		
4:00 PM			0	0	6	0	6	5	17	0	22	37	0	0	37	0	0	0	0		
4:15 PM			0	1	10	0	10	2	21	1	22	36	1	1	37	1	1	0	0		
4:30 PM			0	0	3	0	3	4	29	0	33	31	0	0	31	0	0	0	0		
4:45 PM			0	4	7	0	7	9	29	1	30	41	0	0	41	0	0	0	0		
5:00 PM			0	1	9	0	9	7	32	0	39	37	1	0	38	1	0	0	0		
5:15 PM			0	0	3	0	3	1	46	0	47	29	3	0	32	3	0	0	2		
5:30 PM			0	2	4	0	4	3	43	0	46	26	2	0	28	2	0	0	0		
5:45 PM			0	0	4	0	4	3	34	0	37	34	0	0	34	0	0	0	0		
Total Survey			0	11	66	0	66	47	333	2	341	383	9	1	393	0	0	0	3		

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	30	26	56	0	170	156	326	1	139	157	296	0	339	1	0	0	2
%HV	0.0%				10.0%				5.3%				4.3%				5.3%				
PHF	0.00				0.68				0.90				0.85				0.94				

By Movement	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Total
	In	Out	Total	Bikes	L	R	Total	Bikes	L	T	Total	Bikes	T	R	Total		
Volume			0	0	7	23	30	20	150	170	133	6	139	339			
%HV	NA	NA	NA	0.0%	14.3%	NA	8.7%	10.0%	10.0%	4.7%	NA	5.3%	NA	3.0%	33.3%	4.3%	5.3%
PHF			0.00	0.44	0.64	0.68	0.56	0.82	0.90	0.81	0.50	0.85	0.94				

### Rolling Hour Summary

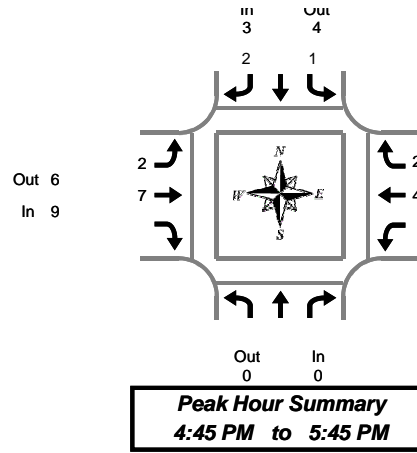
3:00 PM to 6:00 PM

Interval Start Time	Northbound Park And Ride				Southbound Park And Ride				Eastbound Lakeshore Dr				Westbound Lakeshore Dr				Interval Total	Pedestrians Crosswalk			
	In	Out	Bikes	Total	L	R	Bikes	Total	L	T	Bikes	Total	T	R	Bikes	Total		North	South	East	West
3:00 PM			0	3	20	0	23	13	82	0	95	112	2	0	114	0	0	0	1		
3:15 PM			0	3	19	0	22	15	79	0	94	120	2	0	122	0	0	0	1		
3:30 PM			0	4	27	0	31	17	71	1	78	131	3	1	134	0	0	0	0		
3:45 PM			0	3	25	0	28	17	80	1	78	132	3	1	136	0	0	0	0		
4:00 PM			0	5	26	0	31	20	96	2	98	145	1	1	147	1	0	0	0		
4:15 PM			0	6	29	0	35	22	111	2	113	145	2	1	148	1	0	0	0		
4:30 PM			0	5	22	0	27	21	136	1	137	138	4	0	142	1	0	0	2		
4:45 PM			0	7	23	0	30	20	150	1	151	133	6	0	139	1	0	0	2		
5:00 PM			0	3	20	0	23	14	155	0	169	126	6	0	132	1	0	0	2		

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Park And Ride & Lakeshore Dr

Wednesday, May 23, 2018  
3:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Interval Total
	Total	L	R	Total	L	R	Total	L	T	Total	T	R	
3:00 PM	0	0	0	1	1	2	3	5	1	0	1	7	
3:15 PM	0	0	0	0	0	0	6	6	1	0	1	7	
3:30 PM	0	0	0	0	0	1	1	1	2	0	2	3	
3:45 PM	0	0	0	0	0	2	3	5	2	0	2	7	
4:00 PM	0	0	1	1	0	4	4	4	2	0	2	7	
4:15 PM	0	0	0	0	0	0	0	0	3	0	3	3	
4:30 PM	0	0	0	0	0	5	5	5	2	0	2	7	
4:45 PM	0	0	0	0	0	4	4	4	0	0	0	4	
5:00 PM	0	1	1	2	1	1	2	2	1	1	2	6	
5:15 PM	0	0	0	0	0	1	1	1	2	0	2	3	
5:30 PM	0	0	1	1	1	1	2	2	1	1	2	5	
5:45 PM	0	0	0	0	1	3	4	4	2	0	2	6	
Total Survey	0	1	4	5	7	32	39	39	19	2	21	65	

### Heavy Vehicle Peak Hour Summary 4:45 PM to 5:45 PM

By Approach	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	4	7	9	6	15	6	8	14	18
PHF	0.00			0.25			0.19			0.21			0.26

By Movement	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
Volume	0	1	2	3	2	7	9	4	2	6	4	2	6	18
PHF	0.00	0.25	0.25	0.25	0.25	0.18	0.19	0.14	0.25	0.21			0.26	

### Heavy Vehicle Rolling Hour Summary 3:00 PM to 6:00 PM

Interval Start Time	Northbound Park And Ride			Southbound Park And Ride			Eastbound Lakeshore Dr			Westbound Lakeshore Dr			Interval Total
	Total	L	R	Total	L	R	Total	L	T	Total	T	R	
3:00 PM	0	0	1	1	4	13	17	6	0	6	24		
3:15 PM	0	0	1	1	2	14	16	7	0	7	24		
3:30 PM	0	0	1	1	2	8	10	9	0	9	20		
3:45 PM	0	0	1	1	2	12	14	9	0	9	24		
4:00 PM	0	0	1	1	0	13	13	7	0	7	21		
4:15 PM	0	1	1	2	1	10	11	6	1	7	20		
4:30 PM	0	1	1	2	1	11	12	5	1	6	20		
4:45 PM	0	1	2	3	2	7	9	4	2	6	18		
5:00 PM	0	1	2	3	3	6	9	6	2	8	20		

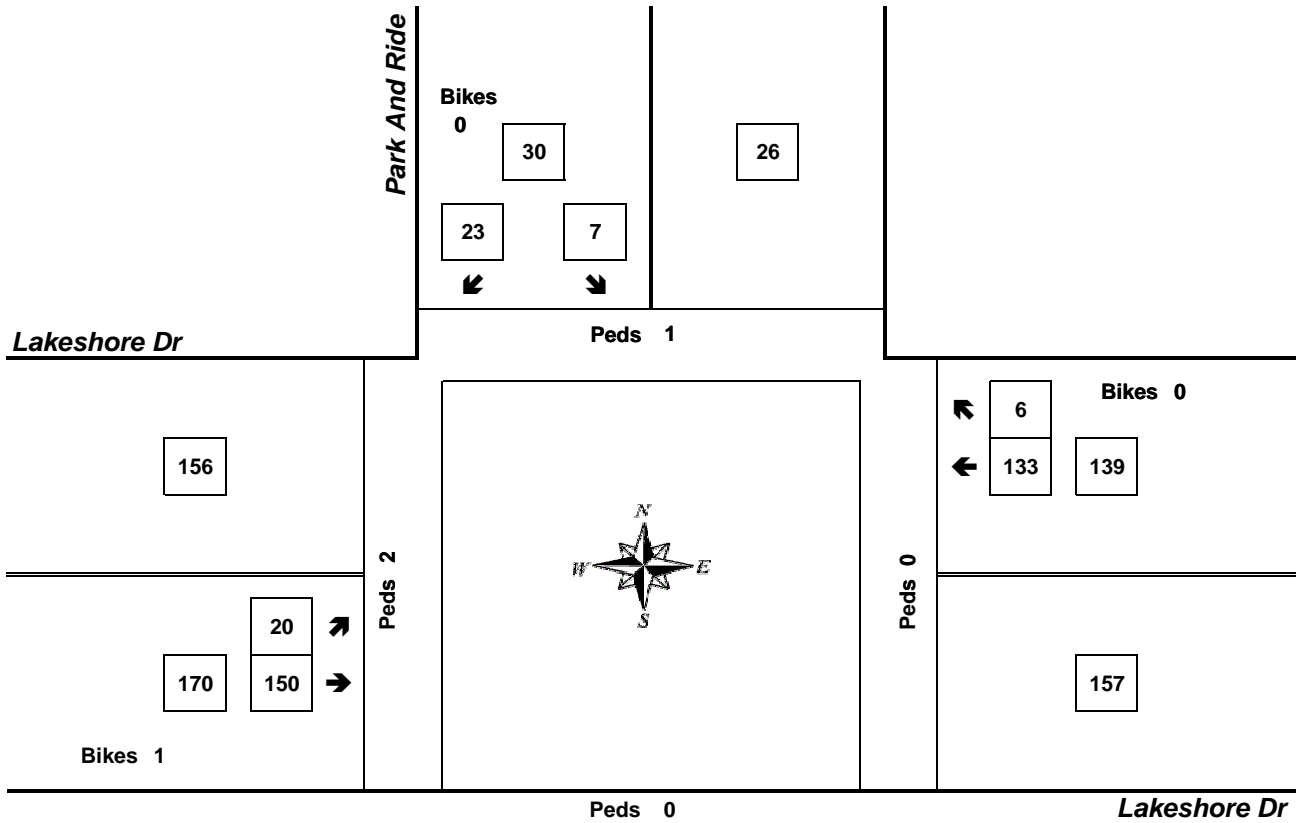
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## Park And Ride & Lakeshore Dr

4:45 PM to 5:45 PM  
Wednesday, May 23, 2018



Approach	PHF	HV%	Volume
EB	0.90	5.3%	170
WB	0.85	4.3%	139
NB	0.00	0.0%	0
SB	0.68	10.0%	30
<b>Intersection</b>	<b>0.94</b>	<b>5.3%</b>	<b>339</b>

Count Period: 3:00 PM to 6:00 PM

# **Appendix B**

## **Trip Generation Calculations**

# ITE Trip Generation

## Trip Generation Based on Weighted Average Rates PBS Engineering and Environmental

General			
Land Use Code	Library (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		10.00	
ITE Land Use Code		590	

Date: 6/19/2018      Analyst: DKE      Project: Woodland Library  
(0071252.000)

	In	Out	Total
Average Weekday	269	270	540
New Trips	269	270	539
AM Peak Hour for adjacent street	8	3	11
New Trips	8	3	11
PM peak hour for adjacent street	34	37	71
New Trips	34	37	71

Library of approximately 10,000 square feet

	AM Peak Hour for adjacent street		
Average Rate	Rate		Trips
	1.06		11
Entering / Exiting			
% entering	72%		8
% exiting	28%		3
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		8	3
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		8	3

Analysis Period	Weekday		
Average Rate	Rate		Trips
	54.00		540
Entering / Exiting			
% entering	50%		269
% exiting	50%		270
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		269	270
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		269	270

Analysis Period	PM peak hour for adjacent street		
Average Rate	Rate		Trips
	7.09		71
Entering / Exiting			
% entering	48%		34
% exiting	52%		37
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		34	37
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		34	37

# ITE Trip Generation

## Trip Generation Based on Weighted Average Rates

PBS Engineering and Environmental

General			
Land Use Code	Recreational Community Center		
Independent Variable	1,000 Sq Ft		
Size (X)		50.00	
ITE Land Use Code		495	

Date: 6/19/2018      Analyst: DKE      Project: Woodland Library  
(0071252.000)

	In	Out	Total
Average Weekday	845	846	1,691
New Trips	845	846	1,691
AM Peak Hour for adjacent street	68	35	103
New Trips	68	35	103
PM peak hour for adjacent street	67	70	137
New Trips	67	70	137

YMCA Community Center - 50,000 SF

	AM Peak Hour for adjacent street		
Average Rate	Rate		Trips
	2.05		103
Entering / Exiting			
% entering	66%		68
% exiting	34%		35
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		68	35
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		68	35

Analysis Period	Weekday		
Average Rate	Rate		Trips
	33.82		1,691
Entering / Exiting			
% entering	50%		845
% exiting	50%		846
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		845	846
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		845	846

Analysis Period	PM peak hour for adjacent street		
Average Rate	Rate		Trips
	2.74		137
Entering / Exiting			
% entering	49%		67
% exiting	51%		70
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		67	70
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		67	70

# ITE Trip Generation

## Trip Generation Based on Weighted Average Rates

PBS Engineering and Environmental

General			
Land Use Code	General Heavy Industrial (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		40.00	
ITE Land Use Code		120	

Date: 6/19/2018      Analyst: DKE      Project: Woodland Library  
(0071252.000)

	In	Out	Total
Average Weekday	29	30	60
New Trips	29	30	59
AM Peak Hour for adjacent street	16	4	20
New Trips	16	4	20
PM peak hour for adjacent street	7	21	28
New Trips	7	21	28

Columbia River Carbonates - 40,000 SF

	AM Peak Hour for adjacent street		
Average Rate	Rate		Trips
	0.51		20
Entering / Exiting			
% entering	80%		16
% exiting	20%		4
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		16	4
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		16	4

Analysis Period	Weekday		
Average Rate	Rate		Trips
	1.50		60
Entering / Exiting			
% entering	50%		29
% exiting	50%		30
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		29	30
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		29	30

Analysis Period	PM peak hour for adjacent street		
Average Rate	Rate		Trips
	0.70		28
Entering / Exiting			
% entering	25%		7
% exiting	75%		21
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		7	21
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		7	21

# ITE Trip Generation

## Trip Generation Based on Weighted Average Rates

PBS Engineering and Environmental

General			
Land Use Code	Coffee/Donut with drive-through window		
Independent Variable	1,000 Sq Ft		
Size (X)		1.00	
ITE Land Use Code		938	

Date: 6/19/2018      Analyst: DKE      Project: Woodland Library  
(0071252.000)

	In	Out	Total
Average Weekday	899	900	1,800
New Trips	153	153	306
AM Peak Hour for adjacent street	152	152	303
New Trips	26	26	52
PM peak hour for adjacent street	38	38	75
New Trips	6	6	13

Dutch Brothers Coffee Stand - 1,000 SF

	AM Peak Hour for adjacent street		
Average Rate	Rate		Trips
	303.33		303
<b>Entering / Exiting</b>			
% entering	50%		152
% exiting	50%		152
<b>New Trips</b>			
% internal			
% pass-by	83%		
		In	Out
Total Trips		152	152
Internal Trips		0	0
Pass-By Trips		126	126
New Trips		26	26

Analysis Period	Weekday		
Average Rate	Rate		Trips
	1800.00		1,800
<b>Entering / Exiting</b>			
% entering	50%		899
% exiting	50%		900
<b>New Trips</b>			
% internal			
% pass-by	83%		
		In	Out
Total Trips		899	900
Internal Trips		0	0
Pass-By Trips		746	747
New Trips		153	153

Analysis Period	PM peak hour for adjacent street		
Average Rate	Rate		Trips
	75.00		75
<b>Entering / Exiting</b>			
% entering	50%		38
% exiting	50%		38
<b>New Trips</b>			
% internal			
% pass-by	83%		
		In	Out
Total Trips		38	38
Internal Trips		0	0
Pass-By Trips		32	32
New Trips		6	6



# ITE Trip Generation

## Trip Generation Based on Weighted Average Rates

PBS Engineering and Environmental

General			
Land Use Code	Recreational Vehicle Sales		
Independent Variable	1,000 Sq Ft		
Size (X)		57.00	
ITE Land Use Code		842	

Date: 6/19/2018      Analyst: DKE      Project: Woodland Library  
(0071252.000)

	In	Out	Total
Average Weekday	-1	0	0
New Trips	-1	0	-1
AM Peak Hour for adjacent street	0	0	0
New Trips	0	0	0
PM peak hour for adjacent street	52	93	145
New Trips	52	93	145

**RV Sales and Repair Shop - 57,000 SF**

	AM Peak Hour for adjacent street		
Average Rate	Rate		Trips
	0		0
<b>Entering / Exiting</b>			
% entering	0%		0
% exiting	0%		0
<b>New Trips</b>			
% internal			
% pass-by			
		In	Out
Total Trips		0	0
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		0	0

Analysis Period	Weekday		
Average Rate	Rate		Trips
	0.00		0
<b>Entering / Exiting</b>			
% entering	0%		-1
% exiting	0%		0
<b>New Trips</b>			
% internal			
% pass-by			
		In	Out
Total Trips		-1	0
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		-1	0

Analysis Period	PM peak hour for adjacent street		
Average Rate	Rate		Trips
	2.54		145
<b>Entering / Exiting</b>			
% entering	36%		52
% exiting	64%		93
<b>New Trips</b>			
% internal			
% pass-by			
		In	Out
Total Trips		52	93
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		52	93

# **Appendix C**

## **Level of Service Calculations**

**Intersection**

Int Delay, s/veh 3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	322	2	59	386	127	1	5	62	50	6	11
Future Vol, veh/h	7	322	2	59	386	127	1	5	62	50	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	350	2	64	420	138	1	5	67	54	7	12

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	558	0	0	352
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.15	-	-	4.15
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.245	-	-	2.245
Pot Cap-1 Maneuver	998	-	-	1190
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	996	-	-	1190
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.8	12.3	32.5
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	567	996	-	-	1190	-	-	202
HCM Lane V/C Ratio	0.13	0.008	-	-	0.054	-	-	0.361
HCM Control Delay (s)	12.3	8.6	0	-	8.2	0	-	32.5
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	1.5

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	434	466	0	0	103
Future Vol, veh/h	0	434	466	0	0	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	472	507	0	0	112

Major/Minor

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	EB	WB	SB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	560
HCM Lane V/C Ratio	-	-	0.2
HCM Control Delay (s)	-	-	13
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.7

# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔		↔	↕	↕				↔	↕	
Traffic Volume (vph)	50	242	139	341	465	243	0	0	0	174	177	1
Future Volume (vph)	50	242	139	341	465	243	0	0	0	174	177	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1719	3250		1719	1810	1538				1719	1808	
Flt Permitted	0.48	1.00		0.36	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	865	3250		654	1810	1538				1719	1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	263	151	371	505	264	0	0	0	189	192	1
RTOR Reduction (vph)	0	82	0	0	0	137	0	0	0	0	0	0
Lane Group Flow (vph)	54	332	0	371	505	127	0	0	0	189	193	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	18.5	15.0		34.0	26.5	26.5				13.1	13.1	
Effective Green, g (s)	18.5	15.0		34.0	26.5	26.5				13.1	13.1	
Actuated g/C Ratio	0.34	0.27		0.62	0.48	0.48				0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	344	884		693	870	739				408	429	
v/s Ratio Prot	0.01	0.10		c0.15	c0.28							0.11
v/s Ratio Perm	0.04			0.18		0.08				c0.11		
v/c Ratio	0.16	0.38		0.54	0.58	0.17				0.46	0.45	
Uniform Delay, d1	12.5	16.3		5.6	10.3	8.1				18.0	17.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.9	1.0	0.1				1.1	1.0	
Delay (s)	12.8	16.4		6.5	11.3	8.2				19.1	18.9	
Level of Service	B	B		A	B	A				B	B	
Approach Delay (s)		16.0			9.0			0.0			19.0	
Approach LOS		B			A			A			B	

### Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↘	↘		↘
Traffic Volume (vph)	129	291	0	0	644	102	223	23	167	11	0	156
Future Volume (vph)	129	291	0	0	644	102	223	23	167	11	0	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.98			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1719	3438			3368			1731	1538	1719		1538
Flt Permitted	0.30	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	549	3438			3368			1731	1538	1719		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	316	0	0	700	111	242	25	182	12	0	170
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	82	0	0	159
Lane Group Flow (vph)	140	316	0	0	805	0	0	267	100	12	0	11
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	42.9	42.9			70.2			28.5	28.5	8.6		8.6
Effective Green, g (s)	42.9	42.9			66.2			28.5	28.5	8.6		8.6
Actuated g/C Ratio	0.32	0.32			0.49			0.21	0.21	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	252	1094			1654			365	325	109		98
v/s Ratio Prot	c0.04	0.09			c0.24					0.01		
v/s Ratio Perm	c0.14							0.15	0.07			c0.01
v/c Ratio	0.56	0.29			0.49			0.73	0.31	0.11		0.11
Uniform Delay, d1	44.1	34.5			22.9			49.6	44.8	59.5		59.5
Progression Factor	1.00	1.00			0.05			1.00	1.00	1.00		1.00
Incremental Delay, d2	2.1	0.1			0.3			7.0	0.4	0.5		0.6
Delay (s)	46.2	34.6			1.4			56.5	45.2	60.0		60.1
Level of Service	D	C			A			E	D	E		E
Approach Delay (s)		38.2			1.4			52.0			60.1	
Approach LOS		D			A			D			E	

Intersection Summary

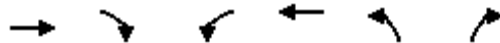
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	134.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	365	109	31	509	249	74
Future Volume (vph)	365	109	31	509	249	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3320		1719	3438	1719	1538
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3320		1719	3438	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	397	118	34	553	271	80
RTOR Reduction (vph)	14	0	0	0	0	28
Lane Group Flow (vph)	501	0	34	553	271	52
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	88.0		6.7	38.1	28.1	28.1
Effective Green, g (s)	88.0		6.7	38.1	28.1	28.1
Actuated g/C Ratio	0.65		0.05	0.28	0.21	0.21
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2167		85	971	358	320
v/s Ratio Prot	c0.15		0.02	c0.16		
v/s Ratio Perm					c0.16	0.03
v/c Ratio	0.23		0.40	0.57	0.76	0.16
Uniform Delay, d1	9.6		62.1	41.3	50.1	43.7
Progression Factor	0.15		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		2.2	0.9	7.9	0.1
Delay (s)	1.5		64.3	42.2	58.0	43.8
Level of Service	A		E	D	E	D
Approach Delay (s)	1.5			43.5	54.8	
Approach LOS	A			D	D	

### Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	134.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	52	0	0	67	3	0	0	0	1	0	10
Future Vol, veh/h	14	52	0	0	67	3	0	0	0	1	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	15	57	0	0	73	3	0	0	0	1	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	57	0	0	167	163	57	161	161	74
Stage 1	-	-	-	-	-	-	87	87	-	74	74	-
Stage 2	-	-	-	-	-	-	80	76	-	87	87	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1504	-	-	1528	-	-	790	724	1001	798	726	979
Stage 1	-	-	-	-	-	-	913	817	-	928	828	-
Stage 2	-	-	-	-	-	-	921	826	-	913	817	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1504	-	-	1528	-	-	775	717	1001	792	719	979
Mov Cap-2 Maneuver	-	-	-	-	-	-	775	717	-	792	719	-
Stage 1	-	-	-	-	-	-	904	809	-	919	828	-
Stage 2	-	-	-	-	-	-	911	826	-	904	809	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0	0	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1504	-	-	1528	-	-	958
HCM Lane V/C Ratio	-	0.01	-	-	-	-	-	0.012
HCM Control Delay (s)	0	7.4	0	-	0	-	-	8.8
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0



**Intersection**

Int Delay, s/veh 5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	420	9	90	340	44	2	4	169	34	4	11
Future Vol, veh/h	2	420	9	90	340	44	2	4	169	34	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	2	457	10	98	370	48	2	4	184	37	4	12

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	417	0	0	466
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1137	-	-	1090
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1135	-	-	1090
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	14.8	46.2
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	555	1135	-	-	1090	-	-	139
HCM Lane V/C Ratio	0.343	0.002	-	-	0.09	-	-	0.383
HCM Control Delay (s)	14.8	8.2	0	-	8.6	0	-	46.2
HCM Lane LOS	B	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	1.5	0	-	-	0.3	-	-	1.6

**Intersection**

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	623	399	0	0	89
Future Vol, veh/h	0	623	399	0	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	677	434	0	0	97

**Major/Minor**

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

**Approach**

	EB	WB	SB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

**Minor Lane/Major Mvmt**

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	620
HCM Lane V/C Ratio	-	-	0.156
HCM Control Delay (s)	-	-	11.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.6

# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗				↖	↗	
Traffic Volume (vph)	58	388	185	293	397	268	0	0	0	354	214	2
Future Volume (vph)	58	388	185	293	397	268	0	0	0	354	214	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1752	3335		1752	1845	1568				1752	1842	
Flt Permitted	0.51	1.00		0.27	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	943	3335		493	1845	1568				1752	1842	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	422	201	318	432	291	0	0	0	385	233	2
RTOR Reduction (vph)	0	37	0	0	0	144	0	0	0	0	0	0
Lane Group Flow (vph)	63	586	0	318	432	147	0	0	0	385	235	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	57.4	57.4		63.3	63.3	63.3				34.5	34.5	
Effective Green, g (s)	57.4	57.4		63.3	63.3	63.3				34.5	34.5	
Actuated g/C Ratio	0.46	0.46		0.51	0.51	0.51				0.28	0.28	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	531	1531		462	934	794				483	508	
v/s Ratio Prot	0.01	c0.18		c0.12	0.23						0.13	
v/s Ratio Perm	0.04			c0.23		0.09				c0.22		
v/c Ratio	0.12	0.38		0.69	0.46	0.19				0.80	0.46	
Uniform Delay, d1	19.6	22.2		20.2	19.9	16.8				42.0	37.6	
Progression Factor	1.00	1.00		0.86	0.60	0.81				1.00	1.00	
Incremental Delay, d2	0.1	0.7		3.6	1.3	0.4				9.4	0.9	
Delay (s)	19.7	22.9		20.8	13.3	14.1				51.4	38.5	
Level of Service	B	C		C	B	B				D	D	
Approach Delay (s)		22.6			15.8			0.0			46.5	
Approach LOS		C			B			A			D	

### Intersection Summary

HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↘	↘		↘
Traffic Volume (vph)	200	527	0	0	462	135	307	34	528	22	0	137
Future Volume (vph)	200	527	0	0	462	135	307	34	528	22	0	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1752	3505			3386			1765	1568	1752		1568
Flt Permitted	0.21	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	386	3505			3386			1765	1568	1752		1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	573	0	0	502	147	334	37	574	24	0	149
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	418	0	0	140
Lane Group Flow (vph)	217	573	0	0	627	0	0	371	156	24	0	9
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	41.5	41.5			48.5			28.0	28.0	7.6		7.6
Effective Green, g (s)	41.5	41.5			48.5			28.0	28.0	7.6		7.6
Actuated g/C Ratio	0.33	0.33			0.39			0.22	0.22	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	372	1163			1313			395	351	106		95
v/s Ratio Prot	c0.10	0.16			c0.19					c0.01		
v/s Ratio Perm	c0.09							0.21	0.10			0.01
v/c Ratio	0.58	0.49			0.48			0.94	0.44	0.23		0.10
Uniform Delay, d1	43.1	33.3			28.7			47.7	41.8	55.9		55.5
Progression Factor	1.18	1.23			0.02			1.00	1.00	1.00		1.00
Incremental Delay, d2	5.6	1.3			0.2			29.9	0.7	1.3		0.5
Delay (s)	56.4	42.4			0.7			77.6	42.4	57.2		56.0
Level of Service	E	D			A			E	D	E		E
Approach Delay (s)		46.2			0.7			56.2			56.1	
Approach LOS		D			A			E			E	

Intersection Summary

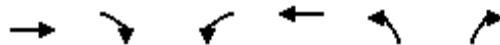
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	782	324	105	439	207	80
Future Volume (vph)	782	324	105	439	207	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3016		1577	3154	1577	1411
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3016		1577	3154	1577	1411
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	850	352	114	477	225	87
RTOR Reduction (vph)	37	0	0	0	0	60
Lane Group Flow (vph)	1165	0	114	477	225	27
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	85.1		10.7	27.3	17.2	17.2
Effective Green, g (s)	85.1		10.7	27.3	17.2	17.2
Actuated g/C Ratio	0.68		0.09	0.22	0.14	0.14
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2053		134	688	216	194
v/s Ratio Prot	c0.39		c0.07	c0.15		
v/s Ratio Perm					c0.14	0.02
v/c Ratio	0.57		0.85	0.69	1.04	0.14
Uniform Delay, d1	10.4		56.4	45.0	53.9	47.4
Progression Factor	0.62		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		37.0	3.2	72.6	0.1
Delay (s)	6.7		93.4	48.2	126.5	47.5
Level of Service	A		F	D	F	D
Approach Delay (s)	6.7			56.9	104.5	
Approach LOS	A			E	F	

### Intersection Summary

HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	150	0	0	133	6	0	0	0	7	0	23
Future Vol, veh/h	20	150	0	0	133	6	0	0	0	7	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	22	163	0	0	145	7	0	0	0	8	0	25

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	151	0	0	163
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1424	-	-	1410
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1424	-	-	1410
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	0	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1424	-	-	1410	-	-	799
HCM Lane V/C Ratio	-	0.015	-	-	-	-	-	0.041
HCM Control Delay (s)	-	0	7.6	0	-	0	-	9.7
HCM Lane LOS	-	A	A	A	-	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

**Intersection**

Int Delay, s/veh 7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	350	2	114	426	136	1	9	92	54	13	12
Future Vol, veh/h	8	350	2	114	426	136	1	9	92	54	13	12
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	9	380	2	124	463	148	1	10	100	59	14	13

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	611	0	0	383
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.15	-	-	4.15
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.245	-	-	2.245
Pot Cap-1 Maneuver	953	-	-	1159
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	951	-	-	1159
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.4	14.7	79.8
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	480	951	-	-	1159	-	-	126
HCM Lane V/C Ratio	0.231	0.009	-	-	0.107	-	-	0.682
HCM Control Delay (s)	14.7	8.8	0	-	8.5	0	-	79.8
HCM Lane LOS	B	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.9	0	-	-	0.4	-	-	3.7

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	484	539	0	0	113
Future Vol, veh/h	0	484	539	0	0	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	526	586	0	0	123

Major/Minor

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	EB	WB	SB
HCM Control Delay, s	0	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	505
HCM Lane V/C Ratio	-	-	0.243
HCM Control Delay (s)	-	-	14.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.9



# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔		↔	↕	↕				↔	↕↔	
Traffic Volume (vph)	67	271	155	366	532	271	0	0	0	203	197	1
Future Volume (vph)	67	271	155	366	532	271	0	0	0	203	197	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1719	3251		1719	1810	1538				1719	1808	
Flt Permitted	0.43	1.00		0.34	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	781	3251		617	1810	1538				1719	1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	295	168	398	578	295	0	0	0	221	214	1
RTOR Reduction (vph)	0	78	0	0	0	155	0	0	0	0	0	0
Lane Group Flow (vph)	73	385	0	398	578	140	0	0	0	221	215	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	23.7	18.5		38.3	29.1	29.1				15.0	15.0	
Effective Green, g (s)	23.7	18.5		38.3	29.1	29.1				15.0	15.0	
Actuated g/C Ratio	0.39	0.30		0.62	0.47	0.47				0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	381	981		669	859	730				420	442	
v/s Ratio Prot	0.02	0.12		c0.15	c0.32							0.12
v/s Ratio Perm	0.06			0.22		0.09				c0.13		
v/c Ratio	0.19	0.39		0.59	0.67	0.19				0.53	0.49	
Uniform Delay, d1	12.0	17.0		6.3	12.4	9.3				20.1	19.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.2	0.2		1.5	2.1	0.1				1.5	1.2	
Delay (s)	12.3	17.1		7.8	14.5	9.4				21.6	21.0	
Level of Service	B	B		A	B	A				C	C	
Approach Delay (s)		16.5			11.2			0.0			21.3	
Approach LOS		B			B			A			C	

### Intersection Summary

HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↗	↘		↗
Traffic Volume (vph)	149	323	0	0	708	109	262	25	179	12	0	170
Future Volume (vph)	149	323	0	0	708	109	262	25	179	12	0	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.98			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1719	3438			3370			1730	1538	1719		1538
Flt Permitted	0.23	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	425	3438			3370			1730	1538	1719		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	162	351	0	0	770	118	285	27	195	13	0	185
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	80	0	0	174
Lane Group Flow (vph)	162	351	0	0	882	0	0	312	115	13	0	11
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	51.1	51.1			79.4			35.6	35.6	8.9		8.9
Effective Green, g (s)	51.1	51.1			75.4			35.6	35.6	8.9		8.9
Actuated g/C Ratio	0.33	0.33			0.49			0.23	0.23	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	243	1134			1641			397	353	98		88
v/s Ratio Prot	c0.05	0.10			c0.26					c0.01		
v/s Ratio Perm	c0.17							0.18	0.07			0.01
v/c Ratio	0.67	0.31			0.54			0.79	0.33	0.13		0.12
Uniform Delay, d1	53.1	38.7			27.6			56.0	49.6	69.3		69.2
Progression Factor	1.00	1.00			0.04			1.00	1.00	1.00		1.00
Incremental Delay, d2	6.1	0.2			0.3			9.5	0.4	0.7		0.7
Delay (s)	59.2	38.8			1.5			65.5	50.0	70.0		70.0
Level of Service	E	D			A			E	D	E		E
Approach Delay (s)		45.3			1.5			59.6			70.0	
Approach LOS		D			A			E			E	

Intersection Summary

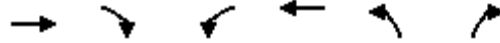
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	154.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	402	117	33	564	267	79
Future Volume (vph)	402	117	33	564	267	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3322		1719	3438	1719	1538
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3322		1719	3438	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	437	127	36	613	290	86
RTOR Reduction (vph)	12	0	0	0	0	28
Lane Group Flow (vph)	552	0	36	613	290	58
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	103.6		7.0	43.2	32.2	32.2
Effective Green, g (s)	103.6		7.0	43.2	32.2	32.2
Actuated g/C Ratio	0.67		0.05	0.28	0.21	0.21
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2223		77	959	357	319
v/s Ratio Prot	c0.17		0.02	c0.18		
v/s Ratio Perm					c0.17	0.04
v/c Ratio	0.25		0.47	0.64	0.81	0.18
Uniform Delay, d1	10.2		72.1	49.0	58.4	50.5
Progression Factor	0.15		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		3.2	1.5	12.5	0.1
Delay (s)	1.6		75.3	50.5	70.9	50.6
Level of Service	A		E	D	E	D
Approach Delay (s)	1.6			51.9	66.3	
Approach LOS	A			D	E	

### Intersection Summary

HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	154.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	56	0	0	72	3	0	0	0	1	0	11
Future Vol, veh/h	15	56	0	0	72	3	0	0	0	1	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	16	61	0	0	78	3	0	0	0	1	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	82	0	0	61	0	0	179	175	61	173	173	80
Stage 1	-	-	-	-	-	-	93	93	-	80	80	-
Stage 2	-	-	-	-	-	-	86	82	-	93	93	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1497	-	-	1523	-	-	776	713	996	783	715	972
Stage 1	-	-	-	-	-	-	907	812	-	921	823	-
Stage 2	-	-	-	-	-	-	914	821	-	907	812	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1497	-	-	1523	-	-	760	705	996	776	707	972
Mov Cap-2 Maneuver	-	-	-	-	-	-	760	705	-	776	707	-
Stage 1	-	-	-	-	-	-	897	803	-	911	823	-
Stage 2	-	-	-	-	-	-	903	821	-	897	803	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0	0	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1497	-	-	1523	-	-	952
HCM Lane V/C Ratio	-	0.011	-	-	-	-	-	0.014
HCM Control Delay (s)		0	7.4	0	0	-	-	8.8
HCM Lane LOS		A	A	A	A	-	-	A
HCM 95th %tile Q(veh)		-	0	-	0	-	-	0

**Intersection**

Int Delay, s/veh 12.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	463	10	146	370	47	2	11	234	36	11	12
Future Vol, veh/h	2	463	10	146	370	47	2	11	234	36	11	12
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	2	503	11	159	402	51	2	12	254	39	12	13

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	453	0	0	514
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1102	-	-	1046
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1100	-	-	1046
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.3	21.9	169.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	476	1100	-	-	1046	-	-	73
HCM Lane V/C Ratio	0.564	0.002	-	-	0.152	-	-	0.878
HCM Control Delay (s)	21.9	8.3	0	-	9.1	0	-	169.3
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	3.4	0	-	-	0.5	-	-	4.4

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	734	460	0	0	96
Future Vol, veh/h	0	734	460	0	0	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	798	500	0	0	104

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 500
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.23
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.327
Pot Cap-1 Maneuver	0	-	- 0 0 569
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - 569
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	569
HCM Lane V/C Ratio	-	-	0.183
HCM Control Delay (s)	-	-	12.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.7

# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗				↖	↗	
Traffic Volume (vph)	84	441	218	361	454	289	0	0	0	384	231	2
Future Volume (vph)	84	441	218	361	454	289	0	0	0	384	231	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1752	3331		1752	1845	1568				1752	1842	
Flt Permitted	0.48	1.00		0.16	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	891	3331		296	1845	1568				1752	1842	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	479	237	392	493	314	0	0	0	417	251	2
RTOR Reduction (vph)	0	45	0	0	0	159	0	0	0	0	0	0
Lane Group Flow (vph)	91	671	0	392	493	155	0	0	0	417	253	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	49.8	49.8		61.6	61.6	61.6				36.1	36.1	
Effective Green, g (s)	49.8	49.8		61.6	61.6	61.6				36.1	36.1	
Actuated g/C Ratio	0.40	0.40		0.49	0.49	0.49				0.29	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	460	1327		461	909	772				505	531	
v/s Ratio Prot	0.02	c0.20		c0.18	0.27						0.14	
v/s Ratio Perm	0.05			c0.23		0.10				c0.24		
v/c Ratio	0.20	0.51		0.85	0.54	0.20				0.83	0.48	
Uniform Delay, d1	25.2	28.3		29.6	21.9	17.8				41.5	36.7	
Progression Factor	1.00	1.00		0.97	0.57	0.97				1.00	1.00	
Incremental Delay, d2	0.2	1.4		10.1	1.6	0.4				11.1	0.9	
Delay (s)	25.4	29.7		38.8	14.2	17.7				52.6	37.6	
Level of Service	C	C		D	B	B				D	D	
Approach Delay (s)		29.2			23.1			0.0			46.9	
Approach LOS		C			C			A			D	

### Intersection Summary

HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↘	↘		↘
Traffic Volume (vph)	226	580	0	0	541	145	341	62	566	24	0	197
Future Volume (vph)	226	580	0	0	541	145	341	62	566	24	0	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1752	3505			3394			1770	1568	1752		1568
Flt Permitted	0.20	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	373	3505			3394			1770	1568	1752		1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	246	630	0	0	588	158	371	67	615	26	0	214
RTOR Reduction (vph)	0	0	0	0	20	0	0	0	402	0	0	201
Lane Group Flow (vph)	246	630	0	0	726	0	0	438	213	26	0	13
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	41.4	41.4			48.3			28.9	28.9	7.7		7.7
Effective Green, g (s)	41.4	41.4			48.3			28.9	28.9	7.7		7.7
Actuated g/C Ratio	0.33	0.33			0.39			0.23	0.23	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	361	1160			1311			409	362	107		96
v/s Ratio Prot	c0.12	0.18			c0.21					c0.01		
v/s Ratio Perm	c0.11							0.25	0.14			0.01
v/c Ratio	0.68	0.54			0.55			1.07	0.59	0.24		0.14
Uniform Delay, d1	44.6	34.1			29.9			48.0	42.8	55.9		55.5
Progression Factor	1.17	1.23			0.03			1.00	1.00	1.00		1.00
Incremental Delay, d2	7.9	1.4			0.3			64.7	2.0	1.4		0.8
Delay (s)	59.9	43.3			1.2			112.7	44.8	57.3		56.3
Level of Service	E	D			A			F	D	E		E
Approach Delay (s)		48.0			1.2			73.0			56.4	
Approach LOS		D			A			E			E	

Intersection Summary

HCM 2000 Control Delay	45.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	853	347	113	485	222	86
Future Volume (vph)	853	347	113	485	222	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3018		1577	3154	1577	1411
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3018		1577	3154	1577	1411
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	927	377	123	527	241	93
RTOR Reduction (vph)	35	0	0	0	0	60
Lane Group Flow (vph)	1269	0	123	527	241	33
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6.8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	86.0		11.0	28.3	16.0	16.0
Effective Green, g (s)	86.0		11.0	28.3	16.0	16.0
Actuated g/C Ratio	0.69		0.09	0.23	0.13	0.13
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2076		138	714	201	180
v/s Ratio Prot	c0.42		c0.08	c0.17		
v/s Ratio Perm					c0.15	0.02
v/c Ratio	0.61		0.89	0.74	1.20	0.18
Uniform Delay, d1	10.5		56.4	44.9	54.5	48.7
Progression Factor	0.61		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		45.5	4.2	127.5	0.2
Delay (s)	6.8		101.9	49.1	182.0	48.8
Level of Service	A		F	D	F	D
Approach Delay (s)	6.8			59.1	144.9	
Approach LOS	A			E	F	

### Intersection Summary

HCM 2000 Control Delay	41.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	161	0	0	143	6	0	0	0	8	0	25
Future Vol, veh/h	21	161	0	0	143	6	0	0	0	8	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	23	175	0	0	155	7	0	0	0	9	0	27

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	162	0	0	175
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1411	-	-	1395
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1411	-	-	1395
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	0	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1411	-	-	1395	-	-	779
HCM Lane V/C Ratio	-	0.016	-	-	-	-	-	0.046
HCM Control Delay (s)	0	7.6	0	-	0	-	-	9.8
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

**Intersection**

Int Delay, s/veh 7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	350	3	120	426	136	1	9	94	54	13	12
Future Vol, veh/h	8	350	3	120	426	136	1	9	94	54	13	12
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	9	380	3	130	463	148	1	10	102	59	14	13

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	611	0	0	384
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.15	-	-	4.15
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.245	-	-	2.245
Pot Cap-1 Maneuver	953	-	-	1158
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	951	-	-	1158
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.5	14.8	83.9
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	478	951	-	-	1158	-	-	123
HCM Lane V/C Ratio	0.236	0.009	-	-	0.113	-	-	0.698
HCM Control Delay (s)	14.8	8.8	0	-	8.5	0	-	83.9
HCM Lane LOS	B	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.9	0	-	-	0.4	-	-	3.8

**Intersection**

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	486	543	0	0	115
Future Vol, veh/h	0	486	543	0	0	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	528	590	0	0	125

**Major/Minor**

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

**Approach**

	EB	WB	SB
HCM Control Delay, s	0	0	14.5
HCM LOS			B

**Minor Lane/Major Mvmt**

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	502
HCM Lane V/C Ratio	-	-	0.249
HCM Control Delay (s)	-	-	14.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1

# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↘		↖	↗	↘				↖	↗	↘
Traffic Volume (vph)	68	273	155	366	536	271	0	0	0	203	197	1
Future Volume (vph)	68	273	155	366	536	271	0	0	0	203	197	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1719	3252		1719	1810	1538				1719	1808	
Flt Permitted	0.43	1.00		0.34	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	773	3252		614	1810	1538				1719	1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	297	168	398	583	295	0	0	0	221	214	1
RTOR Reduction (vph)	0	76	0	0	0	155	0	0	0	0	0	0
Lane Group Flow (vph)	74	389	0	398	583	140	0	0	0	221	215	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	23.7	18.5		38.4	29.2	29.2				15.0	15.0	
Effective Green, g (s)	23.7	18.5		38.4	29.2	29.2				15.0	15.0	
Actuated g/C Ratio	0.39	0.30		0.63	0.48	0.48				0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	378	979		670	860	731				419	441	
v/s Ratio Prot	0.02	0.12		c0.15	c0.32							0.12
v/s Ratio Perm	0.06			0.22		0.09				c0.13		
v/c Ratio	0.20	0.40		0.59	0.68	0.19				0.53	0.49	
Uniform Delay, d1	12.1	17.0		6.3	12.5	9.3				20.1	19.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.3	0.2		1.5	2.1	0.1				1.6	1.2	
Delay (s)	12.4	17.2		7.8	14.6	9.4				21.7	21.1	
Level of Service	B	B		A	B	A				C	C	
Approach Delay (s)		16.6			11.3			0.0			21.4	
Approach LOS		B			B			A			C	

### Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↗	↘		↗
Traffic Volume (vph)	149	324	0	0	712	109	262	25	179	12	0	170
Future Volume (vph)	149	324	0	0	712	109	262	25	179	12	0	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.98			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1719	3438			3370			1730	1538	1719		1538
Flt Permitted	0.23	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	420	3438			3370			1730	1538	1719		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	162	352	0	0	774	118	285	27	195	13	0	185
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	80	0	0	174
Lane Group Flow (vph)	162	352	0	0	886	0	0	312	115	13	0	11
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	51.3	51.3			79.7			35.7	35.7	8.9		8.9
Effective Green, g (s)	51.3	51.3			75.7			35.7	35.7	8.9		8.9
Actuated g/C Ratio	0.33	0.33			0.49			0.23	0.23	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	243	1135			1642			397	353	98		88
v/s Ratio Prot	c0.05	0.10			c0.26					c0.01		
v/s Ratio Perm	c0.17							0.18	0.07			0.01
v/c Ratio	0.67	0.31			0.54			0.79	0.33	0.13		0.12
Uniform Delay, d1	53.4	38.8			27.7			56.2	49.8	69.5		69.5
Progression Factor	1.00	1.00			0.04			1.00	1.00	1.00		1.00
Incremental Delay, d2	6.1	0.2			0.3			9.5	0.4	0.7		0.7
Delay (s)	59.5	39.0			1.5			65.7	50.2	70.3		70.2
Level of Service	E	D			A			E	D	E		E
Approach Delay (s)		45.4			1.5			59.7			70.2	
Approach LOS		D			A			E			E	

Intersection Summary

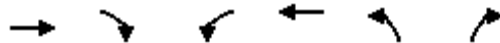
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	155.3	Sum of lost time (s)	22.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	403	117	33	566	268	79
Future Volume (vph)	403	117	33	566	268	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3322		1719	3438	1719	1538
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3322		1719	3438	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	438	127	36	615	291	86
RTOR Reduction (vph)	12	0	0	0	0	28
Lane Group Flow (vph)	553	0	36	615	291	58
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	103.9		7.0	43.3	32.4	32.4
Effective Green, g (s)	103.9		7.0	43.3	32.4	32.4
Actuated g/C Ratio	0.67		0.05	0.28	0.21	0.21
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2222		77	958	358	320
v/s Ratio Prot	c0.17		0.02	c0.18		
v/s Ratio Perm					c0.17	0.04
v/c Ratio	0.25		0.47	0.64	0.81	0.18
Uniform Delay, d1	10.2		72.3	49.2	58.6	50.6
Progression Factor	0.15		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		3.2	1.6	12.5	0.1
Delay (s)	1.6		75.6	50.8	71.1	50.7
Level of Service	A		E	D	E	D
Approach Delay (s)	1.6			52.2	66.4	
Approach LOS	A			D	E	

### Intersection Summary

HCM 2000 Control Delay		37.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio		0.53		
Actuated Cycle Length (s)		155.3	Sum of lost time (s)	22.5
Intersection Capacity Utilization		43.1%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

HCM 2010 TWSC  
 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

09/22/2018

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	56	10	0	72	3	3	0	0	1	0	11
Future Vol, veh/h	13	56	10	0	72	3	3	0	0	1	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	14	61	11	0	78	3	3	0	0	1	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	82	0	0	72	0	0	181	177	66	175	180	80
Stage 1	-	-	-	-	-	-	95	95	-	80	80	-
Stage 2	-	-	-	-	-	-	86	82	-	95	100	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1497	-	-	1509	-	-	774	711	989	781	708	972
Stage 1	-	-	-	-	-	-	904	810	-	921	823	-
Stage 2	-	-	-	-	-	-	914	821	-	904	806	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1497	-	-	1509	-	-	759	704	989	775	701	972
Mov Cap-2 Maneuver	-	-	-	-	-	-	759	704	-	775	701	-
Stage 1	-	-	-	-	-	-	895	802	-	912	823	-
Stage 2	-	-	-	-	-	-	903	821	-	895	798	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0	9.8	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	759	1497	-	-	1509	-	-	952
HCM Lane V/C Ratio	0.004	0.009	-	-	-	-	-	0.014
HCM Control Delay (s)	9.8	7.4	0	-	0	-	-	8.8
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0



**Intersection**

Int Delay, s/veh 20.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	463	15	172	370	47	8	13	262	36	13	12
Future Vol, veh/h	2	463	15	172	370	47	8	13	262	36	13	12
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	2	503	16	187	402	51	9	14	285	39	14	13

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	453	0	0	520
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1102	-	-	1041
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1100	-	-	1041
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.7	32.7	290.4
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	425	1100	-	-	1041	-	-	57
HCM Lane V/C Ratio	0.724	0.002	-	-	0.18	-	-	1.163
HCM Control Delay (s)	32.7	8.3	0	-	9.2	0	-	290.4
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	5.7	0	-	-	0.7	-	-	5.6

**Notes**  
 -: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	762	479	0	0	103
Future Vol, veh/h	0	762	479	0	0	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	828	521	0	0	112

Major/Minor

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	EB	WB	SB
HCM Control Delay, s	0	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	553
HCM Lane V/C Ratio	-	-	0.202
HCM Control Delay (s)	-	-	13.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.8

# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗				↖	↗	
Traffic Volume (vph)	91	460	220	361	473	289	0	0	0	384	231	2
Future Volume (vph)	91	460	220	361	473	289	0	0	0	384	231	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1752	3335		1752	1845	1568				1752	1842	
Flt Permitted	0.47	1.00		0.14	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	874	3335		254	1845	1568				1752	1842	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	500	239	392	514	314	0	0	0	417	251	2
RTOR Reduction (vph)	0	43	0	0	0	170	0	0	0	0	0	0
Lane Group Flow (vph)	99	696	0	392	514	144	0	0	0	417	253	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	48.9	48.9		57.4	57.4	57.4				35.8	35.8	
Effective Green, g (s)	48.9	48.9		57.4	57.4	57.4				35.8	35.8	
Actuated g/C Ratio	0.39	0.39		0.46	0.46	0.46				0.29	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	480	1304		455	847	720				501	527	
v/s Ratio Prot	0.03	c0.21		c0.19	0.28						0.14	
v/s Ratio Perm	0.05			c0.20		0.09				c0.24		
v/c Ratio	0.21	0.53		0.86	0.61	0.20				0.83	0.48	
Uniform Delay, d1	26.1	29.3		33.6	25.3	20.1				41.8	36.9	
Progression Factor	1.00	1.00		0.98	0.63	1.09				1.00	1.00	
Incremental Delay, d2	0.2	1.6		11.0	2.2	0.4				11.8	0.9	
Delay (s)	26.3	30.9		43.8	18.2	22.4				53.5	37.8	
Level of Service	C	C		D	B	C				D	D	
Approach Delay (s)		30.3			27.5			0.0			47.6	
Approach LOS		C			C			A			D	

### Intersection Summary

HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↑	↗	↘		↗
Traffic Volume (vph)	228	597	0	0	556	145	343	62	566	24	0	199
Future Volume (vph)	228	597	0	0	556	145	343	62	566	24	0	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1752	3505			3396			1770	1568	1752		1568
Flt Permitted	0.20	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	369	3505			3396			1770	1568	1752		1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	649	0	0	604	158	373	67	615	26	0	216
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	401	0	0	203
Lane Group Flow (vph)	248	649	0	0	743	0	0	440	214	26	0	13
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	41.7	41.7			48.5			28.6	28.6	7.7		7.7
Effective Green, g (s)	41.7	41.7			48.5			28.6	28.6	7.7		7.7
Actuated g/C Ratio	0.33	0.33			0.39			0.23	0.23	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	363	1169			1317			404	358	107		96
v/s Ratio Prot	c0.12	0.19			c0.22					c0.01		
v/s Ratio Perm	c0.11							0.25	0.14			0.01
v/c Ratio	0.68	0.56			0.56			1.09	0.60	0.24		0.14
Uniform Delay, d1	44.6	34.1			30.0			48.2	43.1	55.9		55.5
Progression Factor	1.16	1.22			0.04			1.00	1.00	1.00		1.00
Incremental Delay, d2	7.8	1.5			0.3			70.9	2.2	1.4		0.8
Delay (s)	59.6	43.1			1.5			119.1	45.3	57.3		56.3
Level of Service	E	D			A			F	D	E		E
Approach Delay (s)		47.6			1.5			76.1			56.4	
Approach LOS		D			A			E			E	

Intersection Summary

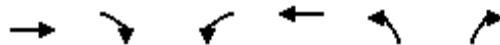
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	864	353	113	495	227	86
Future Volume (vph)	864	353	113	495	227	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3017		1577	3154	1577	1411
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3017		1577	3154	1577	1411
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	939	384	123	538	247	93
RTOR Reduction (vph)	36	0	0	0	0	58
Lane Group Flow (vph)	1287	0	123	538	247	35
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	86.0		11.0	28.5	16.0	16.0
Effective Green, g (s)	86.0		11.0	28.5	16.0	16.0
Actuated g/C Ratio	0.69		0.09	0.23	0.13	0.13
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2075		138	719	201	180
v/s Ratio Prot	c0.43		c0.08	c0.17		
v/s Ratio Perm					c0.16	0.02
v/c Ratio	0.62		0.89	0.75	1.23	0.19
Uniform Delay, d1	10.6		56.4	44.9	54.5	48.7
Progression Factor	0.60		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		45.5	4.5	138.7	0.2
Delay (s)	6.9		101.9	49.4	193.2	48.9
Level of Service	A		F	D	F	D
Approach Delay (s)	6.9			59.2	153.7	
Approach LOS	A			E	F	

### Intersection Summary

HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	161	36	2	143	6	40	0	2	8	0	20
Future Vol, veh/h	17	161	36	2	143	6	40	0	2	8	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	18	175	39	2	155	7	43	0	2	9	0	22

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	162	0	0	214
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1411	-	-	1350
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1411	-	-	1350
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.1	12.2	10
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	543	1411	-	-	1350	-	-	755
HCM Lane V/C Ratio	0.084	0.013	-	-	0.002	-	-	0.04
HCM Control Delay (s)	12.2	7.6	0	-	7.7	0	-	10
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

**Intersection**

Int Delay, s/veh 23.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	426	3	128	517	166	1	11	107	65	15	14
Future Vol, veh/h	9	426	3	128	517	166	1	11	107	65	15	14
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	10	463	3	139	562	180	1	12	116	71	16	15

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	742	0	0	466
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.15	-	-	4.15
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.245	-	-	2.245
Pot Cap-1 Maneuver	852	-	-	1080
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	850	-	-	1080
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.4	19.4	\$ 324.4
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	378	850	-	-	1080	-	-	75
HCM Lane V/C Ratio	0.342	0.012	-	-	0.129	-	-	1.362
HCM Control Delay (s)	19.4	9.3	0	-	8.8	0	-	\$ 324.4
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.5	0	-	-	0.4	-	-	8.1

**Notes**  
 -: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	587	649	0	0	138
Future Vol, veh/h	0	587	649	0	0	138
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	638	705	0	0	150

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	431
HCM Lane V/C Ratio	-	-	0.348
HCM Control Delay (s)	-	-	17.7
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1.5



# HCM Signalized Intersection Capacity Analysis

## 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗				↖	↗	
Traffic Volume (vph)	78	329	188	446	641	328	0	0	0	244	239	1
Future Volume (vph)	78	329	188	446	641	328	0	0	0	244	239	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1719	3251		1719	1810	1538				1719	1808	
Flt Permitted	0.32	1.00		0.27	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	573	3251		486	1810	1538				1719	1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	358	204	485	697	357	0	0	0	265	260	1
RTOR Reduction (vph)	0	78	0	0	0	164	0	0	0	0	0	0
Lane Group Flow (vph)	85	484	0	485	697	193	0	0	0	265	261	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	27.1	21.4		45.5	35.8	35.8				18.5	18.5	
Effective Green, g (s)	27.1	21.4		45.5	35.8	35.8				18.5	18.5	
Actuated g/C Ratio	0.38	0.30		0.63	0.50	0.50				0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	306	966		651	899	764				441	464	
v/s Ratio Prot	0.02	0.15		c0.21	c0.39							0.14
v/s Ratio Perm	0.08			0.26		0.13				c0.15		
v/c Ratio	0.28	0.50		0.75	0.78	0.25				0.60	0.56	
Uniform Delay, d1	14.9	20.9		8.5	14.8	10.4				23.5	23.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.5	0.3		4.8	4.2	0.2				2.7	1.9	
Delay (s)	15.4	21.2		13.3	19.0	10.6				26.2	25.1	
Level of Service	B	C		B	B	B				C	C	
Approach Delay (s)		20.4			15.3			0.0			25.7	
Approach LOS		C			B			A			C	

### Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↗	↘		↗
Traffic Volume (vph)	180	392	0	0	860	133	218	30	315	14	0	207
Future Volume (vph)	180	392	0	0	860	133	218	30	315	14	0	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.98			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1719	3438			3369			1733	1538	1719		1538
Flt Permitted	0.15	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	263	3438			3369			1733	1538	1719		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	426	0	0	935	145	237	33	342	15	0	225
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	158	0	0	213
Lane Group Flow (vph)	196	426	0	0	1075	0	0	270	184	15	0	12
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	62.8	62.8			93.6			31.7	31.7	9.4		9.4
Effective Green, g (s)	62.8	62.8			89.6			31.7	31.7	9.4		9.4
Actuated g/C Ratio	0.36	0.36			0.52			0.18	0.18	0.05		0.05
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	259	1250			1748			318	282	93		83
v/s Ratio Prot	c0.08	0.12			c0.32					c0.01		
v/s Ratio Perm	c0.19							0.16	0.12			0.01
v/c Ratio	0.76	0.34			0.61			0.85	0.65	0.16		0.15
Uniform Delay, d1	60.9	39.9			29.3			68.1	65.4	77.8		77.8
Progression Factor	1.00	1.00			0.07			1.00	1.00	1.00		1.00
Incremental Delay, d2	11.4	0.2			0.4			18.3	4.8	1.0		1.0
Delay (s)	72.2	40.0			2.5			86.5	70.2	78.8		78.8
Level of Service	E	D			A			F	E	E		E
Approach Delay (s)		50.2			2.5			77.4			78.8	
Approach LOS		D			A			E			E	

### Intersection Summary

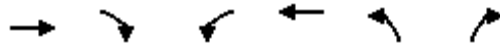
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	172.6	Sum of lost time (s)	22.5
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	488	143	41	684	326	97
Future Volume (vph)	488	143	41	684	326	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3321		1719	3438	1719	1538
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3321		1719	3438	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	530	155	45	743	354	105
RTOR Reduction (vph)	13	0	0	0	0	27
Lane Group Flow (vph)	672	0	45	743	354	78
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	111.9		8.2	49.1	40.5	40.5
Effective Green, g (s)	111.9		8.2	49.1	40.5	40.5
Actuated g/C Ratio	0.65		0.05	0.28	0.23	0.23
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2153		81	978	403	360
v/s Ratio Prot	c0.20		0.03	c0.22		
v/s Ratio Perm					c0.21	0.05
v/c Ratio	0.31		0.56	0.76	0.88	0.22
Uniform Delay, d1	13.4		80.4	56.4	63.7	53.3
Progression Factor	0.19		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		6.5	3.6	18.5	0.1
Delay (s)	2.7		86.9	60.0	82.2	53.4
Level of Service	A		F	E	F	D
Approach Delay (s)	2.7			61.5	75.6	
Approach LOS	A			E	E	

### Intersection Summary

HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	172.6	Sum of lost time (s)	22.5
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	68	0	0	88	4	0	0	0	1	0	13
Future Vol, veh/h	18	68	0	0	88	4	0	0	0	1	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	20	74	0	0	96	4	0	0	0	1	0	14

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	100	0	0	74
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.15	-	-	4.15
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.245	-	-	2.245
Pot Cap-1 Maneuver	1474	-	-	1507
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1474	-	-	1507
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0	0	8.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1474	-	-	1507	-	-	930
HCM Lane V/C Ratio	-	0.013	-	-	-	-	-	0.016
HCM Control Delay (s)	0	7.5	0	-	0	-	-	8.9
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

**Intersection**

Int Delay, s/veh 49.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	562	12	168	450	58	3	12	274	44	12	14
Future Vol, veh/h	3	562	12	168	450	58	3	12	274	44	12	14
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	611	13	183	489	63	3	13	298	48	13	15

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	552	0	0	624
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1013	-	-	952
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1011	-	-	952
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.4	45.4	\$ 933.5
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	383	1011	-	-	952	-	-	31
HCM Lane V/C Ratio	0.82	0.003	-	-	0.192	-	-	2.454
HCM Control Delay (s)	45.4	8.6	0	-	9.7	0	-	\$ 933.5
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	7.4	0	-	-	0.7	-	-	8.9

**Notes**  
 -: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

**Intersection**

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	881	554	0	0	117
Future Vol, veh/h	0	881	554	0	0	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	958	602	0	0	127

**Major/Minor**

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

**Approach**

	EB	WB	SB
HCM Control Delay, s	0	0	14.7
HCM LOS			B

**Minor Lane/Major Mvmt**

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	498
HCM Lane V/C Ratio	-	-	0.255
HCM Control Delay (s)	-	-	14.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1

HCM Signalized Intersection Capacity Analysis  
 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↘		↖	↗	↘				↖	↗	↘
Traffic Volume (vph)	98	533	262	430	547	353	0	0	0	467	282	3
Future Volume (vph)	98	533	262	430	547	353	0	0	0	467	282	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1752	3331		1752	1845	1568				1752	1842	
Flt Permitted	0.44	1.00		0.18	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	811	3331		332	1845	1568				1752	1842	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	579	285	467	595	384	0	0	0	508	307	3
RTOR Reduction (vph)	0	50	0	0	0	217	0	0	0	0	0	0
Lane Group Flow (vph)	107	814	0	467	595	167	0	0	0	508	310	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	40.1	40.1		54.4	54.4	54.4				40.7	40.7	
Effective Green, g (s)	40.1	40.1		54.4	54.4	54.4				40.7	40.7	
Actuated g/C Ratio	0.32	0.32		0.44	0.44	0.44				0.33	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	394	1068		510	802	682				570	599	
v/s Ratio Prot	0.04	c0.24		c0.24	0.32						0.17	
v/s Ratio Perm	0.05			c0.16		0.11				c0.29		
v/c Ratio	0.27	0.76		0.92	0.74	0.25				0.89	0.52	
Uniform Delay, d1	33.2	38.2		33.9	29.4	22.3				40.0	34.2	
Progression Factor	1.00	1.00		0.80	0.65	1.79				1.00	1.00	
Incremental Delay, d2	0.4	5.1		12.0	3.0	0.4				16.4	1.0	
Delay (s)	33.6	43.3		39.2	22.2	40.2				56.4	35.2	
Level of Service	C	D		D	C	D				E	D	
Approach Delay (s)		42.2			32.5			0.0			48.4	
Approach LOS		D			C			A			D	

Intersection Summary

HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↘	↘		↘
Traffic Volume (vph)	274	704	0	0	658	177	414	70	691	29	0	229
Future Volume (vph)	274	704	0	0	658	177	414	70	691	29	0	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1752	3505			3394			1769	1568	1752		1568
Flt Permitted	0.19	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	351	3505			3394			1769	1568	1752		1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	298	765	0	0	715	192	450	76	751	32	0	249
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	383	0	0	233
Lane Group Flow (vph)	298	765	0	0	888	0	0	526	368	32	0	16
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	42.0	42.0			49.5			28.1	28.1	7.9		7.9
Effective Green, g (s)	42.0	42.0			49.5			28.1	28.1	7.9		7.9
Actuated g/C Ratio	0.34	0.34			0.40			0.22	0.22	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	353	1177			1344			397	352	110		99
v/s Ratio Prot	c0.14	0.22			c0.26					c0.02		
v/s Ratio Perm	c0.14							0.30	0.23			0.01
v/c Ratio	0.84	0.65			0.66			1.32	1.05	0.29		0.16
Uniform Delay, d1	46.8	35.3			30.9			48.5	48.5	55.9		55.4
Progression Factor	1.25	1.33			0.09			1.00	1.00	1.00		1.00
Incremental Delay, d2	13.4	1.6			0.1			162.8	60.4	1.7		0.9
Delay (s)	71.8	48.6			2.8			211.3	108.8	57.6		56.3
Level of Service	E	D			A			F	F	E		E
Approach Delay (s)		55.1			2.8			151.0			56.4	
Approach LOS		E			A			F			E	

Intersection Summary

HCM 2000 Control Delay	76.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

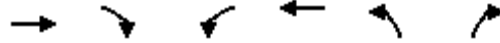
c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	1038	424	137	588	271	105
Future Volume (vph)	1038	424	137	588	271	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3017		1577	3154	1577	1411
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3017		1577	3154	1577	1411
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1128	461	149	639	295	114
RTOR Reduction (vph)	35	0	0	0	0	60
Lane Group Flow (vph)	1554	0	149	639	295	54
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6.8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	86.0		11.0	29.5	16.0	16.0
Effective Green, g (s)	86.0		11.0	29.5	16.0	16.0
Actuated g/C Ratio	0.69		0.09	0.24	0.13	0.13
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2075		138	744	201	180
v/s Ratio Prot	c0.51		c0.09	c0.20		
v/s Ratio Perm					c0.19	0.04
v/c Ratio	0.75		1.08	0.86	1.47	0.30
Uniform Delay, d1	12.5		57.0	45.8	54.5	49.4
Progression Factor	0.63		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9		99.5	10.0	235.6	0.3
Delay (s)	8.8		156.5	55.8	290.1	49.8
Level of Service	A		F	E	F	D
Approach Delay (s)	8.8			74.8	223.1	
Approach LOS	A			E	F	

### Intersection Summary

HCM 2000 Control Delay	58.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	196	0	0	174	8	0	0	0	9	0	30
Future Vol, veh/h	26	196	0	0	174	8	0	0	0	9	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	213	0	0	189	9	0	0	0	10	0	33

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	198	0	0	213
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1369	-	-	1351
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1369	-	-	1351
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	0	10.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1369	-	-	1351	-	-	729
HCM Lane V/C Ratio	-	0.021	-	-	-	-	-	0.058
HCM Control Delay (s)		0	7.7	0	0	-	-	10.2
HCM Lane LOS		A	A	A	-	A	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.2

**Intersection**

Int Delay, s/veh 25

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	426	4	134	517	166	1	11	109	65	15	14
Future Vol, veh/h	9	426	4	134	517	166	1	11	109	65	15	14
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	10	463	4	146	562	180	1	12	118	71	16	15

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	742	0	0	467
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.15	-	-	4.15
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.245	-	-	2.245
Pot Cap-1 Maneuver	852	-	-	1079
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	850	-	-	1079
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.5	19.7	\$ 351.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	375	850	-	-	1079	-	-	72
HCM Lane V/C Ratio	0.351	0.012	-	-	0.135	-	-	1.419
HCM Control Delay (s)	19.7	9.3	0	-	8.9	0	-	\$ 351.3
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.5	0	-	-	0.5	-	-	8.4

**Notes**  
 -: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	589	653	0	0	140
Future Vol, veh/h	0	589	653	0	0	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	640	710	0	0	152

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	429
HCM Lane V/C Ratio	-	-	0.355
HCM Control Delay (s)	-	-	17.9
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1.6

HCM Signalized Intersection Capacity Analysis  
 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↘		↖	↗	↘				↖	↗	↘
Traffic Volume (vph)	79	331	188	446	645	328	0	0	0	244	239	1
Future Volume (vph)	79	331	188	446	645	328	0	0	0	244	239	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1719	3252		1719	1810	1538				1719	1808	
Flt Permitted	0.31	1.00		0.27	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	566	3252		483	1810	1538				1719	1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	360	204	485	701	357	0	0	0	265	260	1
RTOR Reduction (vph)	0	77	0	0	0	163	0	0	0	0	0	0
Lane Group Flow (vph)	86	487	0	485	701	194	0	0	0	265	261	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	27.1	21.4		45.6	35.9	35.9				18.5	18.5	
Effective Green, g (s)	27.1	21.4		45.6	35.9	35.9				18.5	18.5	
Actuated g/C Ratio	0.38	0.30		0.63	0.50	0.50				0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	303	965		651	901	765				441	463	
v/s Ratio Prot	0.02	0.15		c0.21	c0.39						0.14	
v/s Ratio Perm	0.08			0.26		0.13				c0.15		
v/c Ratio	0.28	0.50		0.75	0.78	0.25				0.60	0.56	
Uniform Delay, d1	14.9	21.0		8.6	14.8	10.4				23.6	23.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.5	0.3		4.8	4.3	0.2				2.7	1.9	
Delay (s)	15.5	21.3		13.4	19.1	10.6				26.2	25.2	
Level of Service	B	C		B	B	B				C	C	
Approach Delay (s)		20.5			15.3			0.0			25.7	
Approach LOS		C			B			A			C	

Intersection Summary

HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	72.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↙	↗	↘		↗
Traffic Volume (vph)	180	393	0	0	864	133	315	30	218	14	0	207
Future Volume (vph)	180	393	0	0	864	133	315	30	218	14	0	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.98			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1719	3438			3369			1731	1538	1719		1538
Flt Permitted	0.12	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	217	3438			3369			1731	1538	1719		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	427	0	0	939	145	342	33	237	15	0	225
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	81	0	0	213
Lane Group Flow (vph)	196	427	0	0	1078	0	0	375	156	15	0	12
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	63.5	63.5			93.6			40.1	40.1	9.5		9.5
Effective Green, g (s)	63.5	63.5			89.6			40.1	40.1	9.5		9.5
Actuated g/C Ratio	0.35	0.35			0.49			0.22	0.22	0.05		0.05
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	240	1202			1662			382	339	89		80
v/s Ratio Prot	c0.09	0.12			c0.32					c0.01		
v/s Ratio Perm	c0.20							0.22	0.10			0.01
v/c Ratio	0.82	0.36			0.65			0.98	0.46	0.17		0.15
Uniform Delay, d1	67.8	43.8			34.3			70.4	61.4	82.3		82.2
Progression Factor	1.00	1.00			0.06			1.00	1.00	1.00		1.00
Incremental Delay, d2	18.5	0.2			0.5			41.0	0.7	1.1		1.0
Delay (s)	86.3	44.0			2.7			111.3	62.1	83.3		83.2
Level of Service	F	D			A			F	E	F		F
Approach Delay (s)		57.3			2.7			92.3			83.2	
Approach LOS		E			A			F			F	

Intersection Summary

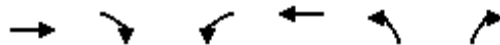
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	181.6	Sum of lost time (s)	22.5
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	489	143	41	686	327	97
Future Volume (vph)	489	143	41	686	327	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3322		1719	3438	1719	1538
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3322		1719	3438	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	532	155	45	746	355	105
RTOR Reduction (vph)	12	0	0	0	0	27
Lane Group Flow (vph)	675	0	45	746	355	78
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	121.1		8.4	49.5	40.1	40.1
Effective Green, g (s)	121.1		8.4	49.5	40.1	40.1
Actuated g/C Ratio	0.67		0.05	0.27	0.22	0.22
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2215		79	937	379	339
v/s Ratio Prot	c0.20		0.03	c0.22		
v/s Ratio Perm					c0.21	0.05
v/c Ratio	0.30		0.57	0.80	0.94	0.23
Uniform Delay, d1	12.6		84.8	61.4	69.5	58.1
Progression Factor	0.14		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		7.4	5.0	29.9	0.1
Delay (s)	1.8		92.3	66.3	99.4	58.2
Level of Service	A		F	E	F	E
Approach Delay (s)	1.8			67.8	90.0	
Approach LOS	A			E	F	

### Intersection Summary

HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	181.6	Sum of lost time (s)	22.5
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	68	10	0	88	4	3	0	0	1	0	13
Future Vol, veh/h	16	68	10	0	88	4	3	0	0	1	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	17	74	11	0	96	4	3	0	0	1	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	100	0	0	85	0	0	219	214	79	212	218	98
Stage 1	-	-	-	-	-	-	114	114	-	98	98	-
Stage 2	-	-	-	-	-	-	105	100	-	114	120	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1474	-	-	1493	-	-	731	678	973	739	675	950
Stage 1	-	-	-	-	-	-	884	795	-	901	808	-
Stage 2	-	-	-	-	-	-	893	806	-	884	791	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1474	-	-	1493	-	-	714	670	973	732	667	950
Mov Cap-2 Maneuver	-	-	-	-	-	-	714	670	-	732	667	-
Stage 1	-	-	-	-	-	-	873	785	-	890	808	-
Stage 2	-	-	-	-	-	-	880	806	-	873	782	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0	10.1	8.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	714	1474	-	-	1493	-	-	930
HCM Lane V/C Ratio	0.005	0.012	-	-	-	-	-	0.016
HCM Control Delay (s)	10.1	7.5	0	-	0	-	-	8.9
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1



**Intersection**

Int Delay, s/veh 90.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	562	17	194	450	58	9	14	302	44	14	14
Future Vol, veh/h	3	562	17	194	450	58	9	14	302	44	14	14
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	611	18	211	489	63	10	15	328	48	15	15

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	552	0	0	629
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1013	-	-	948
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1011	-	-	948
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.7	107.1	\$ 1604.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	329	1011	-	-	948	-	-	21
HCM Lane V/C Ratio	1.074	0.003	-	-	0.222	-	-	3.727
HCM Control Delay (s)	107.1	8.6	0	-	9.9	0	-	\$ 1604.7
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	13.1	0	-	-	0.8	-	-	10.1

**Notes**  
 -: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 2010 TWSC  
 2: Goerig St & Lewis River Rd (SR 503)

09/22/2018

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	909	573	0	0	124
Future Vol, veh/h	0	909	573	0	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	988	623	0	0	135

Major/Minor

	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	EB	WB	SB
HCM Control Delay, s	0	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt

	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	484
HCM Lane V/C Ratio	-	-	0.278
HCM Control Delay (s)	-	-	15.3
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1.1

HCM Signalized Intersection Capacity Analysis  
 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔		↔	↕	↕				↔	↕↔	
Traffic Volume (vph)	105	552	264	430	566	353	0	0	0	467	282	3
Future Volume (vph)	105	552	264	430	566	353	0	0	0	467	282	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00				1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85				1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1752	3335		1752	1845	1568				1752	1842	
Flt Permitted	0.43	1.00		0.17	1.00	1.00				0.95	1.00	
Satd. Flow (perm)	796	3335		318	1845	1568				1752	1842	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	600	287	467	615	384	0	0	0	508	307	3
RTOR Reduction (vph)	0	47	0	0	0	215	0	0	0	0	0	0
Lane Group Flow (vph)	114	840	0	467	615	169	0	0	0	508	310	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm				Perm	NA	
Protected Phases	1	6		5	2						4	
Permitted Phases	6			2		2				4		
Actuated Green, G (s)	40.8	40.8		55.1	55.1	55.1				40.3	40.3	
Effective Green, g (s)	40.8	40.8		55.1	55.1	55.1				40.3	40.3	
Actuated g/C Ratio	0.33	0.33		0.44	0.44	0.44				0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0				4.0	4.0	
Vehicle Extension (s)	3.0	2.5		3.5	3.0	3.0				4.0	4.0	
Lane Grp Cap (vph)	394	1088		506	813	691				564	593	
v/s Ratio Prot	0.04	c0.25		c0.24	0.33						0.17	
v/s Ratio Perm	0.05			c0.17		0.11				c0.29		
v/c Ratio	0.29	0.77		0.92	0.76	0.24				0.90	0.52	
Uniform Delay, d1	33.1	37.9		34.3	29.3	21.9				40.4	34.5	
Progression Factor	1.00	1.00		0.80	0.66	1.80				1.00	1.00	
Incremental Delay, d2	0.4	5.3		12.8	3.1	0.4				17.8	1.1	
Delay (s)	33.5	43.2		40.3	22.4	39.8				58.2	35.6	
Level of Service	C	D		D	C	D				E	D	
Approach Delay (s)		42.1			32.7			0.0			49.7	
Approach LOS		D			C			A			D	

Intersection Summary

HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑			↘	↘	↘		↘
Traffic Volume (vph)	276	721	0	0	673	177	416	70	691	29	0	231
Future Volume (vph)	276	721	0	0	673	177	416	70	691	29	0	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (prot)	1752	3505			3396			1769	1568	1752		1568
Flt Permitted	0.19	1.00			1.00			0.96	1.00	0.95		1.00
Satd. Flow (perm)	351	3505			3396			1769	1568	1752		1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	300	784	0	0	732	192	452	76	751	32	0	251
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	381	0	0	235
Lane Group Flow (vph)	300	784	0	0	905	0	0	528	370	32	0	16
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Prot		Perm
Protected Phases	1	6			2 10			3		4		
Permitted Phases	6						3		3			4
Actuated Green, G (s)	42.0	42.0			49.5			28.1	28.1	7.9		7.9
Effective Green, g (s)	42.0	42.0			49.5			28.1	28.1	7.9		7.9
Actuated g/C Ratio	0.34	0.34			0.40			0.22	0.22	0.06		0.06
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5
Lane Grp Cap (vph)	353	1177			1344			397	352	110		99
v/s Ratio Prot	c0.14	0.22			c0.27					c0.02		
v/s Ratio Perm	c0.14							0.30	0.24			0.01
v/c Ratio	0.85	0.67			0.67			1.33	1.05	0.29		0.16
Uniform Delay, d1	46.8	35.5			31.1			48.5	48.5	55.9		55.4
Progression Factor	1.25	1.33			0.09			1.00	1.00	1.00		1.00
Incremental Delay, d2	13.4	1.7			0.1			164.9	61.7	1.7		0.9
Delay (s)	71.9	48.8			3.0			213.4	110.1	57.6		56.3
Level of Service	E	D			A			F	F	E		E
Approach Delay (s)		55.2			3.0			152.8			56.5	
Approach LOS		E			A			F			E	

Intersection Summary

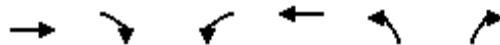
HCM 2000 Control Delay	76.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 5: CC St & Lewis River Rd (SR 503)

09/22/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	1049	430	137	598	276	105
Future Volume (vph)	1049	430	137	598	276	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	6.5	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3017		1577	3154	1577	1411
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3017		1577	3154	1577	1411
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1140	467	149	650	300	114
RTOR Reduction (vph)	36	0	0	0	0	59
Lane Group Flow (vph)	1571	0	149	650	300	55
Turn Type	NA		Prot	NA	Perm	Perm
Protected Phases	6 8		5	2		
Permitted Phases					14	14
Actuated Green, G (s)	86.0		11.0	29.5	16.0	16.0
Effective Green, g (s)	86.0		11.0	29.5	16.0	16.0
Actuated g/C Ratio	0.69		0.09	0.24	0.13	0.13
Clearance Time (s)			4.0	6.5	4.0	4.0
Vehicle Extension (s)			2.5	3.8	1.5	1.5
Lane Grp Cap (vph)	2075		138	744	201	180
v/s Ratio Prot	c0.52		c0.09	c0.21		
v/s Ratio Perm					c0.19	0.04
v/c Ratio	0.76		1.08	0.87	1.49	0.30
Uniform Delay, d1	12.7		57.0	46.0	54.5	49.4
Progression Factor	0.63		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9		99.5	11.4	246.1	0.3
Delay (s)	8.9		156.5	57.3	300.6	49.8
Level of Service	A		F	E	F	D
Approach Delay (s)	8.9			75.8	231.5	
Approach LOS	A			E	F	

### Intersection Summary

HCM 2000 Control Delay	60.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	196	36	0	174	8	40	0	2	9	0	25
Future Vol, veh/h	22	196	36	0	174	8	40	0	2	9	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	24	213	39	0	189	9	43	0	2	10	0	27

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	198	0	0	252
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227
Pot Cap-1 Maneuver	1369	-	-	1307
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1369	-	-	1307
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	13.4	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	476	1369	-	-	1307	-	-	709
HCM Lane V/C Ratio	0.096	0.017	-	-	-	-	-	0.052
HCM Control Delay (s)	13.4	7.7	0	-	0	-	-	10.4
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.2

# **Appendix D**

## **Queue Length Calculations**

Queuing and Blocking Report  
 Weekday AM Peak Hour - 2018 Existing Conditions

09/24/2018

Intersection: 1: Lakeshore Dr/Buckeye St & Goerig St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	57	103	67	71
Average Queue (ft)	5	23	31	34
95th Queue (ft)	30	73	54	63
Link Distance (ft)	365	82	199	233
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		2		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Goerig St & Lewis River Rd (SR 503)

Movement	EB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	3	4	86
Average Queue (ft)	0	0	40
95th Queue (ft)	3	4	69
Link Distance (ft)	82	173	155
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	65	146	142	236	289	25	137	146
Average Queue (ft)	28	70	63	100	117	1	67	67
95th Queue (ft)	58	124	116	184	219	18	113	122
Link Distance (ft)		173			419	419		926
Upstream Blk Time (%)		0	0					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (ft)	105		105	115			100	
Storage Blk Time (%)	0	1	1	3	6		2	2
Queuing Penalty (veh)	0	5	2	15	22		3	4



Queuing and Blocking Report  
 Weekday AM Peak Hour - 2018 Existing Conditions

09/24/2018

Intersection: 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	LT	R	L	R
Maximum Queue (ft)	168	142	144	36	27	298	100	40	92
Average Queue (ft)	66	48	50	6	2	147	45	8	46
95th Queue (ft)	130	100	111	23	13	251	79	30	76
Link Distance (ft)		419	419	54	54	1109			852
Upstream Blk Time (%)				0	0				
Queuing Penalty (veh)				0	0				
Storage Bay Dist (ft)	130						150	55	
Storage Blk Time (%)	2	0				10	0	0	3
Queuing Penalty (veh)	3	0				17	0	0	0

Intersection: 5: CC St & Lewis River Rd (SR 503)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	23	57	153	310	264	340	183
Average Queue (ft)	1	29	32	146	101	158	37
95th Queue (ft)	11	63	89	256	205	270	111
Link Distance (ft)	54	54		661		692	
Upstream Blk Time (%)		3					
Queuing Penalty (veh)		6					
Storage Bay Dist (ft)			85		270		110
Storage Blk Time (%)			0	24	0	23	
Queuing Penalty (veh)			2	70	0	17	

Intersection: 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	31	33
Average Queue (ft)	2	9
95th Queue (ft)	15	32
Link Distance (ft)	199	176
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 171

Queuing and Blocking Report  
 Weekday PM Peak Hour - 2018 Existing Conditions

08/14/2018

Intersection: 1: Lakeshore Dr/Buckeye St & Goerig St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	87	150	110	74
Average Queue (ft)	5	44	53	30
95th Queue (ft)	39	115	87	60
Link Distance (ft)	365	98	199	233
Upstream Blk Time (%)		1		
Queuing Penalty (veh)		7		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Goerig St & Lewis River Rd (SR 503)

Movement	EB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	141	69	92
Average Queue (ft)	17	3	40
95th Queue (ft)	83	35	70
Link Distance (ft)	98	189	211
Upstream Blk Time (%)	1	0	
Queuing Penalty (veh)	8	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	156	255	185	240	424	165	165	586
Average Queue (ft)	40	148	123	137	174	7	149	252
95th Queue (ft)	105	267	207	249	384	96	191	497
Link Distance (ft)		189			419	419		1412
Upstream Blk Time (%)	0	5	1		2	0		
Queuing Penalty (veh)	0	35	0		8	0		
Storage Bay Dist (ft)	105		105	115			100	
Storage Blk Time (%)	0	14	13	15	17		32	14
Queuing Penalty (veh)	1	63	34	62	50		71	49

Queuing and Blocking Report  
 Weekday PM Peak Hour - 2018 Existing Conditions

08/14/2018

Intersection: 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	LT	R	L	R
Maximum Queue (ft)	250	288	298	67	37	504	661	66	134
Average Queue (ft)	131	152	182	14	5	260	293	20	52
95th Queue (ft)	223	244	271	49	21	469	619	53	100
Link Distance (ft)		419	419	60	60	1156	1156		975
Upstream Blk Time (%)		0	0	3	0				
Queuing Penalty (veh)		0	0	12	1				
Storage Bay Dist (ft)	130							55	
Storage Blk Time (%)	15	12						3	9
Queuing Penalty (veh)	40	25						4	2

Intersection: 5: CC St & Lewis River Rd (SR 503)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	47	87	224	426	302	811	235
Average Queue (ft)	9	69	115	202	155	420	134
95th Queue (ft)	32	85	215	351	268	860	302
Link Distance (ft)	60	60		660		1212	
Upstream Blk Time (%)	0	18					
Queuing Penalty (veh)	0	95					
Storage Bay Dist (ft)			85		270		110
Storage Blk Time (%)			25	43	1	68	0
Queuing Penalty (veh)			111	141	2	55	1

Intersection: 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	44	50
Average Queue (ft)	4	21
95th Queue (ft)	23	47
Link Distance (ft)	199	176
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 879

Queuing and Blocking Report  
 Weekday AM Peak Hour - 2025 Conditions without Project

08/13/2018

Intersection: 1: Lakeshore Dr/Buckeye St & Goerig St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	81	165	104	109
Average Queue (ft)	8	49	41	44
95th Queue (ft)	45	122	75	85
Link Distance (ft)	365	82	199	233
Upstream Blk Time (%)		1		
Queuing Penalty (veh)		10		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Goerig St & Lewis River Rd (SR 503)

Movement	EB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	5	30	109
Average Queue (ft)	0	1	46
95th Queue (ft)	5	18	83
Link Distance (ft)	82	173	155
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	129	197	162	239	371	84	157	226
Average Queue (ft)	36	86	76	124	158	3	84	85
95th Queue (ft)	76	157	133	222	308	60	140	173
Link Distance (ft)		173			419	419		926
Upstream Blk Time (%)	0	0	0		0	0		
Queuing Penalty (veh)	0	2	0		2	0		
Storage Bay Dist (ft)	105		105	115			100	
Storage Blk Time (%)	0	3	2	7	11		5	4
Queuing Penalty (veh)	0	13	5	37	42		9	9

Queuing and Blocking Report  
 Weekday AM Peak Hour - 2025 Conditions without Project

08/13/2018

Intersection: 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	LT	R	L	R
Maximum Queue (ft)	209	174	168	51	30	400	196	43	102
Average Queue (ft)	88	68	74	10	3	195	56	10	48
95th Queue (ft)	169	134	143	37	16	335	130	34	79
Link Distance (ft)		419	419	54	54	1109			852
Upstream Blk Time (%)				1	0				
Queuing Penalty (veh)				6	1				
Storage Bay Dist (ft)	130						150	55	
Storage Blk Time (%)	6	1				21	0	0	4
Queuing Penalty (veh)	11	2				39	1	1	1

Intersection: 5: CC St & Lewis River Rd (SR 503)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	22	61	196	505	319	390	235
Average Queue (ft)	1	36	42	217	146	195	59
95th Queue (ft)	12	70	125	425	296	325	178
Link Distance (ft)	54	54		661		692	
Upstream Blk Time (%)	0	5		1			
Queuing Penalty (veh)	0	14		0			
Storage Bay Dist (ft)			85		270		110
Storage Blk Time (%)			1	38	1	33	0
Queuing Penalty (veh)			5	122	4	26	0

Intersection: 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	26	36
Average Queue (ft)	1	9
95th Queue (ft)	12	32
Link Distance (ft)	199	176
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 361

Queuing and Blocking Report  
 Weekday PM Peak Hour - 2025 Conditions without Project

08/14/2018

Intersection: 1: Lakeshore Dr/Buckeye St & Goerig St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	220	168	232	107
Average Queue (ft)	22	80	109	40
95th Queue (ft)	106	171	213	84
Link Distance (ft)	365	98	199	233
Upstream Blk Time (%)	0	5	5	
Queuing Penalty (veh)	0	30	10	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Goerig St & Lewis River Rd (SR 503)

Movement	EB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	167	160	122
Average Queue (ft)	54	14	43
95th Queue (ft)	155	82	84
Link Distance (ft)	98	189	211
Upstream Blk Time (%)	6	0	0
Queuing Penalty (veh)	49	1	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	184	260	185	240	439	264	165	711
Average Queue (ft)	68	197	152	188	263	23	155	337
95th Queue (ft)	154	308	218	286	479	177	188	657
Link Distance (ft)		189			419	419		1412
Upstream Blk Time (%)	0	13	2		4	0		
Queuing Penalty (veh)	0	98	0		25	1		
Storage Bay Dist (ft)	105		105	115			100	
Storage Blk Time (%)	1	22	26	33	29		40	17
Queuing Penalty (veh)	7	119	80	153	105		95	68

Queuing and Blocking Report  
 Weekday PM Peak Hour - 2025 Conditions without Project

08/14/2018

Intersection: 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	LT	R	L	R
Maximum Queue (ft)	252	284	302	69	46	1079	1108	117	238
Average Queue (ft)	148	161	196	29	8	770	778	26	86
95th Queue (ft)	240	250	280	70	31	1391	1429	76	175
Link Distance (ft)		419	419	60	60	1156	1156		975
Upstream Blk Time (%)				8	0	24	24		
Queuing Penalty (veh)				30	1	0	0		
Storage Bay Dist (ft)	130							55	
Storage Blk Time (%)	21	15						6	28
Queuing Penalty (veh)	61	35						11	7

Intersection: 5: CC St & Lewis River Rd (SR 503)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	42	88	225	634	325	1198	235
Average Queue (ft)	7	71	134	297	193	1022	175
95th Queue (ft)	29	85	249	605	336	1563	332
Link Distance (ft)	60	60		660		1212	
Upstream Blk Time (%)	0	20		7		59	
Queuing Penalty (veh)	1	120		0		0	
Storage Bay Dist (ft)			85		270		110
Storage Blk Time (%)			30	54	3	88	1
Queuing Penalty (veh)			149	194	10	76	1

Intersection: 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	69	30	67
Average Queue (ft)	6	3	24
95th Queue (ft)	41	29	55
Link Distance (ft)	199	277	176
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 1537

Queuing and Blocking Report  
 Weekday AM Peak Hour - 2025 Conditions With Project Trips

08/13/2018

Intersection: 1: Lakeshore Dr/Buckeye St & Goerig St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	71	161	90	90
Average Queue (ft)	8	49	41	42
95th Queue (ft)	41	118	71	75
Link Distance (ft)	365	82	199	233
Upstream Blk Time (%)		2		
Queuing Penalty (veh)		11		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Goerig St & Lewis River Rd (SR 503)

Movement	EB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	2	35	107
Average Queue (ft)	0	1	48
95th Queue (ft)	0	13	84
Link Distance (ft)	82	173	155
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	113	184	163	239	356	86	157	186
Average Queue (ft)	36	87	78	118	150	4	80	86
95th Queue (ft)	75	153	139	217	282	75	137	154
Link Distance (ft)		173			419	419		926
Upstream Blk Time (%)	0	0	0	0	0	0		
Queuing Penalty (veh)	0	2	0		1	1		
Storage Bay Dist (ft)	105		105	115			100	
Storage Blk Time (%)	0	3	2	6	10		4	4
Queuing Penalty (veh)	0	13	5	32	38		8	9



Queuing and Blocking Report  
 Weekday AM Peak Hour - 2025 Conditions With Project Trips

08/13/2018

Intersection: 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	LT	R	L	R
Maximum Queue (ft)	231	234	196	52	23	384	147	50	102
Average Queue (ft)	90	70	74	9	3	184	48	11	49
95th Queue (ft)	178	160	150	34	15	314	88	36	80
Link Distance (ft)		419	419	54	54	1109			852
Upstream Blk Time (%)				1	0				
Queuing Penalty (veh)				4	0				
Storage Bay Dist (ft)	130						150	55	
Storage Blk Time (%)	7	1				19	0	1	4
Queuing Penalty (veh)	13	1				35	1	1	1

Intersection: 5: CC St & Lewis River Rd (SR 503)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	21	62	178	457	325	434	235
Average Queue (ft)	1	36	40	207	148	200	60
95th Queue (ft)	11	70	115	395	301	355	184
Link Distance (ft)	54	54		661		692	
Upstream Blk Time (%)	0	5		1		0	
Queuing Penalty (veh)	0	14		0		0	
Storage Bay Dist (ft)			85		270		110
Storage Blk Time (%)			1	35	1	34	0
Queuing Penalty (veh)			5	114	3	28	0

Intersection: 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	15	31	31
Average Queue (ft)	1	3	12
95th Queue (ft)	8	19	36
Link Distance (ft)	199	143	176
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 339

Queuing and Blocking Report  
 Weekday PM Peak Hour - 2025 Conditions With Project Trips

08/14/2018

Intersection: 1: Lakeshore Dr/Buckeye St & Goerig St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	199	174	235	125
Average Queue (ft)	23	101	132	45
95th Queue (ft)	106	190	241	106
Link Distance (ft)	365	98	199	233
Upstream Blk Time (%)		9	9	1
Queuing Penalty (veh)		55	20	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Goerig St & Lewis River Rd (SR 503)

Movement	EB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	176	221	130
Average Queue (ft)	58	29	51
95th Queue (ft)	162	130	101
Link Distance (ft)	98	189	211
Upstream Blk Time (%)	6	1	
Queuing Penalty (veh)	49	5	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-5 SB On-Ramp/Pacific St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	184	260	185	240	444	419	165	812
Average Queue (ft)	72	203	154	199	306	48	156	374
95th Queue (ft)	155	303	219	293	517	266	186	773
Link Distance (ft)		189			419	419		1412
Upstream Blk Time (%)	0	13	2		6	0		0
Queuing Penalty (veh)	0	101	0		36	1		0
Storage Bay Dist (ft)	105		105	115			100	
Storage Blk Time (%)	2	22	24	35	29		43	17
Queuing Penalty (veh)	13	122	80	166	107		102	67

Queuing and Blocking Report  
 Weekday PM Peak Hour - 2025 Conditions With Project Trips

08/14/2018

Intersection: 4: I-5 NB Off-Ramp/Atlantic St & Lewis River Rd (SR 503)

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	LT	R	L	R
Maximum Queue (ft)	252	314	322	72	56	1098	1148	109	247
Average Queue (ft)	151	163	201	41	11	748	707	26	97
95th Queue (ft)	245	259	290	79	38	1358	1362	75	186
Link Distance (ft)		419	419	60	60	1156	1156		975
Upstream Blk Time (%)			0	13	1	22	22		
Queuing Penalty (veh)			0	48	4	0	0		
Storage Bay Dist (ft)	130							55	
Storage Blk Time (%)	22	15						4	37
Queuing Penalty (veh)	67	36						9	9

Intersection: 5: CC St & Lewis River Rd (SR 503)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	41	81	225	648	325	1251	235
Average Queue (ft)	7	71	167	439	250	1169	176
95th Queue (ft)	29	85	274	804	397	1428	334
Link Distance (ft)	60	60		660		1212	
Upstream Blk Time (%)	0	21		23		73	
Queuing Penalty (veh)	0	128		0		0	
Storage Bay Dist (ft)			85		270		110
Storage Blk Time (%)			46	64	5	92	0
Queuing Penalty (veh)			226	234	20	79	1

Intersection: 6: Library Driveway/Visitor Center (P+R) & Lakeshore Dr

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	54	29	84	53
Average Queue (ft)	5	3	32	21
95th Queue (ft)	29	28	76	50
Link Distance (ft)	199	277	143	176
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1784

# Appendix E

## Collision Rate Calculations and Data

Collision Rate Calculations at  
Goerig St-Lakeshore Dr-Buckeye

Intersection: Goerig St-Lakeshore Dr-Buckeye Date 9/17/2018

Ra =	System Wide Average accident rate =	0.6
K =	Statistical Constant =	1.645
Average Daily cars passing Through intersection		
	ADT	4740
		1750
		4310
		490
M=	Millions of Vehicles for a three year period =	<b>20.60425</b>

Rc= Critical Accident Rate = **0.85644655**

## Accident Rate

Number of accidents =	8
Number of years =	5

Accident Rate = **0.3882694**

$$Rc = Ra + (K * Ra / M)^{.5} - 1 / (2 * M)$$

ADT = 2018 PM Count X 10  
PM Peak Hour= Approx. 10% ADT

Collision Rate Calculations at  
Goerig St-Lewis River Rd

Intersection: Goerig St-Lewis River Rd Date 9/17/2018

Ra =	System Wide Average accident rate =	0.6
K =	Statistical Constant =	1.645
Average Daily cars passing Through intersection		
ADT		310
		260
		260
		230
M=	Millions of Vehicles for a three year period =	<b>1.9345</b>

Rc= Critical Accident Rate = **1.2576654**

## Accident Rate

Number of accidents =	2
Number of years =	5

Accident Rate = **1.03385888**

$$Rc = Ra + (K * Ra / M)^{.5} - 1 / (2 * M)$$

ADT = 2018 PM Count X 10  
PM Peak Hour= Approx. 10% ADT

Collision Rate Calculations at  
Pacific Ave-I5 SB-Lewis River Rd

Intersection: Pacific Ave-I5 SB-Lewis River Rd Date 9/17/2018

Ra =	System Wide Average accident rate =	0.6
K =	Statistical Constant =	1.645
Average Daily cars passing Through intersection		
ADT		5700
		9580
		6310
		0
M=	Millions of Vehicles for a three year period =	<b>39.40175</b>

Rc= Critical Accident Rate = **0.79030447**

## Accident Rate

Number of accidents =	25
Number of years =	5

Accident Rate = **0.63448958**

$$Rc = Ra + (K * Ra / M)^{.5} - 1 / (2 * M)$$

ADT = 2018 PM Count X 10  
PM Peak Hour= Approx. 10% ADT

Collision Rate Calculations at  
Atlantic-I5 NB-Lewis River Rd

Intersection: Atlantic-I5 NB-Lewis River Rd Date 9/17/2018

Ra =	System Wide Average accident rate =	0.6
K =	Statistical Constant =	1.645
Average Daily cars passing Through intersection		
ADT		1590
		6270
		8690
		7270
M=	Millions of Vehicles for a three year period =	<b>43.4715</b>

Rc= Critical Accident Rate = **0.78175698**

## Accident Rate

Number of accidents =	15
Number of years =	5

Accident Rate = **0.34505366**

$$R_c = R_a + (K * R_a / M)^{.5} - 1 / (2 * M)$$

ADT = 2018 PM Count X 10  
PM Peak Hour= Approx. 10% ADT



Collision Rate Calculations at  
E CC St-Lewis River Rd

Intersection: E CC St-Lewis River Rd Date 9/17/2018

Ra =	System Wide Average accident rate =	0.6
K =	Statistical Constant =	1.645
Average Daily cars passing Through intersection		
ADT		11060
		2870
		5440
M=	Millions of Vehicles for a three year period =	35.35025

Rc= Critical Accident Rate = 0.80016723

## Accident Rate

Number of accidents =	6
Number of years =	5

Accident Rate = 0.16973006

$$R_c = R_a + (K * R_a / M)^{.5} - 1 / (2 * M)$$

ADT = 2018 PM Count X 10  
PM Peak Hour= Approx. 10% ADT

Collision Rate Calculations at  
Lakeshore Dr-Park and Ride

Intersection: Lakeshore Dr-Park and Ride Date 9/17/2018

Ra =	System Wide Average accident rate =	0.6
K =	Statistical Constant =	1.645
Average Daily cars passing Through intersection		
ADT		300
		1390
		1700
M=	Millions of Vehicles for a three year period =	<b>6.18675</b>

Rc= Critical Accident Rate = **1.03146548**

## Accident Rate

Number of accidents =	0
Number of years =	5

Accident Rate =	<b>0</b>
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$$Rc = Ra + (K * Ra / M)^{.5} - 1 / (2 * M)$$

ADT = 2018 PM Count X 10  
PM Peak Hour= Approx. 10% ADT

Collision #	JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	MILEPOST	DATE	MOST SEVERE INJURY TYPE	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION
1	City Street	Cowlitz	Woodland	BUCKEYE ST	100			01/09/2014	No Apparent Injury	At Driveway	One parked--one moving	Backing	Illegally Parked, Unoccupied
2	City Street	Cowlitz	Woodland	GOERIG ST	1400			07/06/2014	No Apparent Injury	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
-	City Street	Cowlitz	Woodland	GOERIG ST	900			09/28/2017	Possible Injury	Not at Intersection and Not Related	From opposite direction - all others	Making U-Turn	Going Straight Ahead
3	City Street	Cowlitz	Woodland	GOERIG ST	900	BUCKEYE ST		05/28/2015	Possible Injury	At Intersection and Related	From opposite direction - both moving - head-on	Making Left Turn	Going Straight Ahead
4	City Street	Cowlitz	Woodland	GOERIG ST	800	BUCKEYE ST		03/05/2015	Possible Injury	At Intersection and Related	Entering at angle	Starting From Parked Position	Going Straight Ahead
5	City Street	Cowlitz	Woodland	GOERIG ST	900	BUCKEYE ST		11/08/2013	No Apparent Injury	At Intersection and Related	Entering at angle	Making Left Turn	Stopped at Signal or Stop Sign
6	City Street	Cowlitz	Woodland	GOERIG ST	700	BUCKEYE ST		03/19/2015	No Apparent Injury	At Intersection and Related	Entering at angle	Going Straight Ahead	Going Straight Ahead
7	City Street	Cowlitz	Woodland	GOERIG ST	0	LAKESHORE DR		11/21/2017	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
8	City Street	Cowlitz	Woodland	GOERIG ST	100	LAKESHORE DR		07/09/2014	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Stopped at Signal or Stop Sign	Going Straight Ahead
1	City Street	Cowlitz	Woodland	GOERIG ST	0	LEWIS RIVER RD		10/12/2017	Possible Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
-	City Street	Cowlitz	Woodland	LAKESHORE DR	700			06/23/2015	Suspected Serious Injury	Not at Intersection and Not Related	Vehicle overturned	Going Straight Ahead	
-	City Street	Cowlitz	Woodland	LAKESHORE DR	700			12/26/2017	No Apparent Injury	Not at Intersection and Not Related	One parked--one moving	Going Straight Ahead	Legally Parked, Unoccupied
-	City Street	Cowlitz	Woodland	LAKESHORE DR	700			12/12/2014	No Apparent Injury	Not at Intersection and Not Related	Wood Sign Post	Going Straight Ahead	
1	City Street	Cowlitz	Woodland	LEWIS RIVER RD	7100			01/13/2017	No Apparent Injury	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
2	City Street	Cowlitz	Woodland	N GOERIG ST	1600			06/06/2016	No Apparent Injury	At Driveway	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
-	City Street	Cowlitz	Woodland	N GOERIG ST	1400			02/25/2014	No Apparent Injury	Not at Intersection and Not Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped in Roadway
2	State Route	Cowlitz	Woodland	005FD02108		Lewis River Dr	0.00	11/10/2015	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
3	State Route	Cowlitz	Woodland	005LX02108			0.00	07/10/2014	No Apparent Injury	At Intersection and Related	Entering at angle	Making Left Turn	Stopped at Signal or Stop Sign
4	State Route	Cowlitz	Woodland	005LX02108			0.00	06/18/2015	Possible Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
5	State Route	Cowlitz	Woodland	005LX02108			0.00	09/15/2016	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
6	State Route	Cowlitz	Woodland	005LX02108			0.00	01/09/2013	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
7	State Route	Cowlitz	Woodland	005LX02108			0.00	04/12/2017	Possible Injury	At Intersection and Related	Entering at angle	Going Straight Ahead	Going Straight Ahead
8	State Route	Cowlitz	Woodland	005LX02108			0.00	12/26/2013	Suspected Minor Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
-	State Route	Cowlitz	Woodland	005LX02108			0.00	12/04/2013	No Apparent Injury	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead
9	State Route	Cowlitz	Woodland	005LX02108			0.00	10/24/2014	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
10	State Route	Cowlitz	Woodland	005LX02108			0.00	12/26/2014	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one right turn	Merging (Entering Traffic)	Merging (Entering Traffic)
11	State Route	Cowlitz	Woodland	005LX02108			0.00	08/07/2015	Possible Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
12	State Route	Cowlitz	Woodland	005LX02108			0.00	10/31/2016	No Apparent Injury	At Intersection and Related	Entering at angle	Making Left Turn	Making Left Turn
-	State Route	Cowlitz	Woodland	005LX02108			0.00	12/14/2015	No Apparent Injury	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end	Stopped at Signal or Stop Sign	Going Straight Ahead
13	State Route	Cowlitz	Woodland	005LX02108			0.00	11/13/2015	No Apparent Injury	At Intersection and Related	Same direction -- both turning left -- both moving -- rear end	Making Left Turn	Making Left Turn
14	State Route	Cowlitz	Woodland	005LX02108			0.00	08/30/2013	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one right turn	Making Left Turn	Making Right Turn
15	State Route	Cowlitz	Woodland	005LX02108			0.00	11/24/2017	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
16	State Route	Cowlitz	Woodland	005LX02108			0.00	11/26/2016	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
17	State Route	Cowlitz	Woodland	005LX02108			0.00	07/20/2013	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
18	State Route	Cowlitz	Woodland	005LX02108			0.00	01/02/2016	Possible Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
19	State Route	Cowlitz	Woodland	005LX02108			0.00	05/03/2016	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
20	State Route	Cowlitz	Woodland	005LX02108			0.00	03/04/2014	Possible Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
21	State Route	Cowlitz	Woodland	005LX02108			0.00	10/03/2014	No Apparent Injury	At Intersection and Related	Entering at angle	Going Straight Ahead	Going Straight Ahead
22	State Route	Cowlitz	Woodland	005LX02108			0.00	07/13/2013	Possible Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
23	State Route	Cowlitz	Woodland	005LX02108			0.00	10/04/2015	No Apparent Injury	At Intersection and Related	Same direction -- both turning left -- both moving -- rear end	Making Left Turn	Slowing
24	State Route	Cowlitz	Woodland	005LX02108			0.00	09/29/2013	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
25	State Route	Cowlitz	Woodland	005LX02108			0.00	09/27/2017	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
-	State Route	Cowlitz	Woodland	005LX02108			0.01	06/23/2014	No Apparent Injury	Not at Intersection and Not Related	From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead
-	State Route	Cowlitz	Woodland	005LX02108			0.02	05/15/2017	Possible Injury	Not at Intersection and Not Related	From same direction - all others	Going Straight Ahead	Going Straight Ahead
-	State Route	Cowlitz	Woodland	005P102085			0.23	03/17/2013	No Apparent Injury	Not at Intersection and Not Related	From same direction - both going straight - both moving - sideswipe	Going Straight Ahead	Going Straight Ahead
-	State Route	Cowlitz	Woodland	005P102085			0.23	07/18/2013	No Apparent Injury	Not at Intersection and Not Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
1	State Route	Cowlitz	Woodland	005P102085			0.25	08/21/2014	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Going Straight Ahead
2	State Route	Cowlitz	Woodland	005P102085			0.25	12/14/2015	Suspected Minor Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
3	State Route	Cowlitz	Woodland	005P102085			0.25	10/04/2016	Possible Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Slowing	Stopped at Signal or Stop Sign
-	State Route	Cowlitz	Woodland	005S102071			0.00	07/13/2017	No Apparent Injury	At Intersection and Not Related	Signal Pole	Going Straight Ahead	
1	State Route	Cowlitz	Woodland	503			54.31	05/10/2015	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign
2	State Route	Cowlitz	Woodland	503			54.31	10/26/2013	Suspected Minor Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Stopped at Signal or Stop Sign	Going Straight Ahead
3	State Route	Cowlitz	Woodland	503			54.31	07/06/2016	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
4	State Route	Cowlitz	Woodland	503			54.31	01/04/2014	Possible Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Changing Lanes	Stopped at Signal or Stop Sign
-	State Route	Cowlitz	Woodland	503			54.31	08/05/2016	No Apparent Injury	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic
5	State Route	Cowlitz	Woodland	503			54.31	04/27/2015	No Apparent Injury	At Intersection and Related	From same direction - both going straight - both moving - sideswipe	Merging (Entering Traffic)	Going Straight Ahead
6	State Route	Cowlitz	Woodland	503			54.31	07/28/2017	No Apparent Injury	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign

4	State Route	Cowlitz	Woodland	503		54.33	10/31/2013	No Apparent Injury	At Intersection and Related	Entering at angle	Changing Lanes	Making Right Turn
5	State Route	Cowlitz	Woodland	503		54.33	01/13/2015	Possible Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
6	State Route	Cowlitz	Woodland	503		54.33	01/27/2017	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
7	State Route	Cowlitz	Woodland	503		54.33	05/24/2016	Possible Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
8	State Route	Cowlitz	Woodland	503		54.33	07/13/2013	Suspected Minor Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
9	State Route	Cowlitz	Woodland	503		54.33	05/02/2014	No Apparent Injury	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead
-	State Route	Cowlitz	Woodland	503		54.33	12/12/2014	No Apparent Injury	At Intersection and Related	From same direction - both going straight - both moving - rear-end	Slowing	Slowing
10	State Route	Cowlitz	Woodland	503		54.33	12/30/2016	No Apparent Injury	At Intersection and Related	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead
11	State Route	Cowlitz	Woodland	503		54.33	09/23/2014	No Apparent Injury	At Intersection and Related	Entering at angle	Going Straight Ahead	Starting From Parked Position
12	State Route	Cowlitz	Woodland	503		54.33	05/16/2017	No Apparent Injury	At Intersection and Related	Entering at angle	Going Straight Ahead	Starting in Traffic Lane
13	State Route	Cowlitz	Woodland	503		54.34	04/25/2017	Possible Injury	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing
14	State Route	Cowlitz	Woodland	503		54.35	03/17/2017	No Apparent Injury	Intersection Related but Not at Intersection	From same direction - all others	Backing	Stopped at Signal or Stop Sign
15	State Route	Cowlitz	Woodland	503		54.35	10/21/2013	No Apparent Injury	At Intersection and Related	From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead
-	State Route	Cowlitz	Woodland	503		54.36	12/04/2013	No Apparent Injury	Not at Intersection and Not Related	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic