Transportation Impact Analysis

SCOTT HILL PARK

City of Woodland, Washington

Prepared for:

ROTARY FOUNDATION OF WOODLAND
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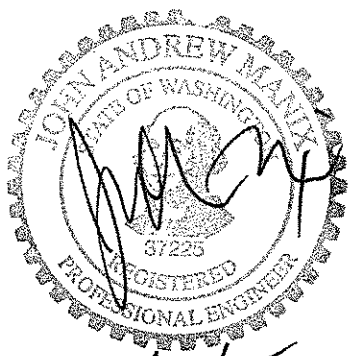

11/18/15

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November 19, 2015

EXECUTIVE SUMMARY

PURPOSE

The Rotary Foundation of Woodland WA, has submitted a site plan for the Scott Hill Park Project. The site is located at the top of Scott Hill Road, is owned by the City of Woodland, and is located in Woodland, Washington. This proposal would develop an undeveloped site of approximately 40 acres. The site is located in Section 47, Township 5 North, Range 1 West of the Willamette Meridian. The project proposes to access Scott Hill Road through two new roadways, both will connect to existing dead end roads. One roadway will connect to Scott Hill Road and the other to Meriwether Lane. This project is scheduled for completion in 2020. This report analyzes the traffic impacts generated by the completed development as required by the City of Woodland (City) and after consultation with City staff.

CONCLUSIONS

The findings of the Traffic Impact Analysis are listed below:

1. A background annual growth rate of 2.3% is expected in the area. This analysis assumes the approved projects will be complete in the 2040 design horizon year.

2. All studied intersections will operate at an acceptable level of service (LOS) in the 2040 design year with or without the project.

3. No left or right turn lanes, nor further turn analysis are recommended.

4. The 2010-2015 collision history at the study intersections was reviewed. The proposed project will not have a significant impact on traffic safety at the studied intersections, as the project traffic volumes increase is marginally larger than the 2040 volumes without the project. Currently, all intersections reviewed in the project study area have collision rates lower than the critical rate. No further analysis is recommended.

5. The Lewis River Road (SR 503)/N Goerig Street intersection angle does not meet the WSDOT Design Manual guideline minimums. This is an existing condition that does not appear to have contributed to collisions at this location. No further analysis is recommended

6. There is no public transit within walking distance of the proposal. There is transit service to the Woodland Park and Ride lot near I-5, approximately 1-1/2 miles away. The community at large does not have transit service. The park and ride lot transit service is provided by Lower Columbia Action Program (CAP). The existing transit service will not be extended due to the implementation of the Scott Hill Park Project.

7. Direct access to the Scott Hill Park project site currently does not exist. When the site roadways are designed, they will need to be designed to follow AASHTO requirements for stopping and intersection sight distance.

PROJECT-RELATED IMPROVEMENTS

RECOMMENDATIONS

The traffic impact analysis supports the following recommendations:

Design the site access points to Scott Hill Road and Meriwether Lane to follow AASHTO requirements for stopping and intersection sight distance.

Do not install objects within the sight distance triangle that would block the drivers view exiting the site at either new access point onto Scott Hill Road or Meriwether Lane.

All sidewalks and driveways constructed will need to be ADA compliant.

Install directional signing to the Scott Hill Park, per City of Woodland, at the following intersections:

- I-5 NB off-ramp/SR 503/Atlantic Avenue
- Atlantic Avenue/East Scott Avenue
- East Scott Avenue/Old Pacific Highway
- Old Pacific Highway/Scott Hill Road

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

INTRODUCTION

The purpose of this study is to determine the impacts of the traffic generated by the Scott Hill Park Project proposal on the surrounding roadway infrastructure. This site is shown on the vicinity map (Figure 1). This study will determine if mitigation is required to keep the roadways operating safely and at capacity levels acceptable under the current Level of Service (LOS) standards. This report documents the findings and conclusions of a Transportation Impact Analysis (TIA) conducted for the proposed site plan (Figure 2) application for property located in the City of Woodland, Washington.

SCOPE OF STUDY

This study documents the existing and proposed conditions, traffic data, safety analysis, and capacity in accordance with the requirements of City of Woodland ordinances.

The scope of the traffic study was refined in phone conversations and email correspondence with City of Woodland staff. The following intersections were identified for analysis:

- *Scott Hill Road/Old Pacific Highway*
- *East Scott Avenue/Old Pacific Highway*
- *Insel Road/Lewis River Road*
- *Hillshire Drive/Lewis River Road*
- *Lewis River Road/North Goerig Street*

This study includes analysis of the background growth and in-process trips, at a rate of 2.3% annual to analyze future conditions. The in-process trips are from the Meriwether subdivision project, east of the development site.

This TIA is prepared for submission to the City of Woodland. Traffic related issues addressed in this report are consistent with discussions with the City of Woodland staff. The issues are:

- *Existing traffic conditions.*
- *Site generated traffic volumes and their distribution.*
- *Future project generated traffic and conditions.*
- *Capacity analysis of the existing and future conditions for weekday PM and Saturday peak hour.*
- *Safety analysis of the existing and future conditions.*
- *Recommendations for mitigation of traffic impacts and conclusions.*

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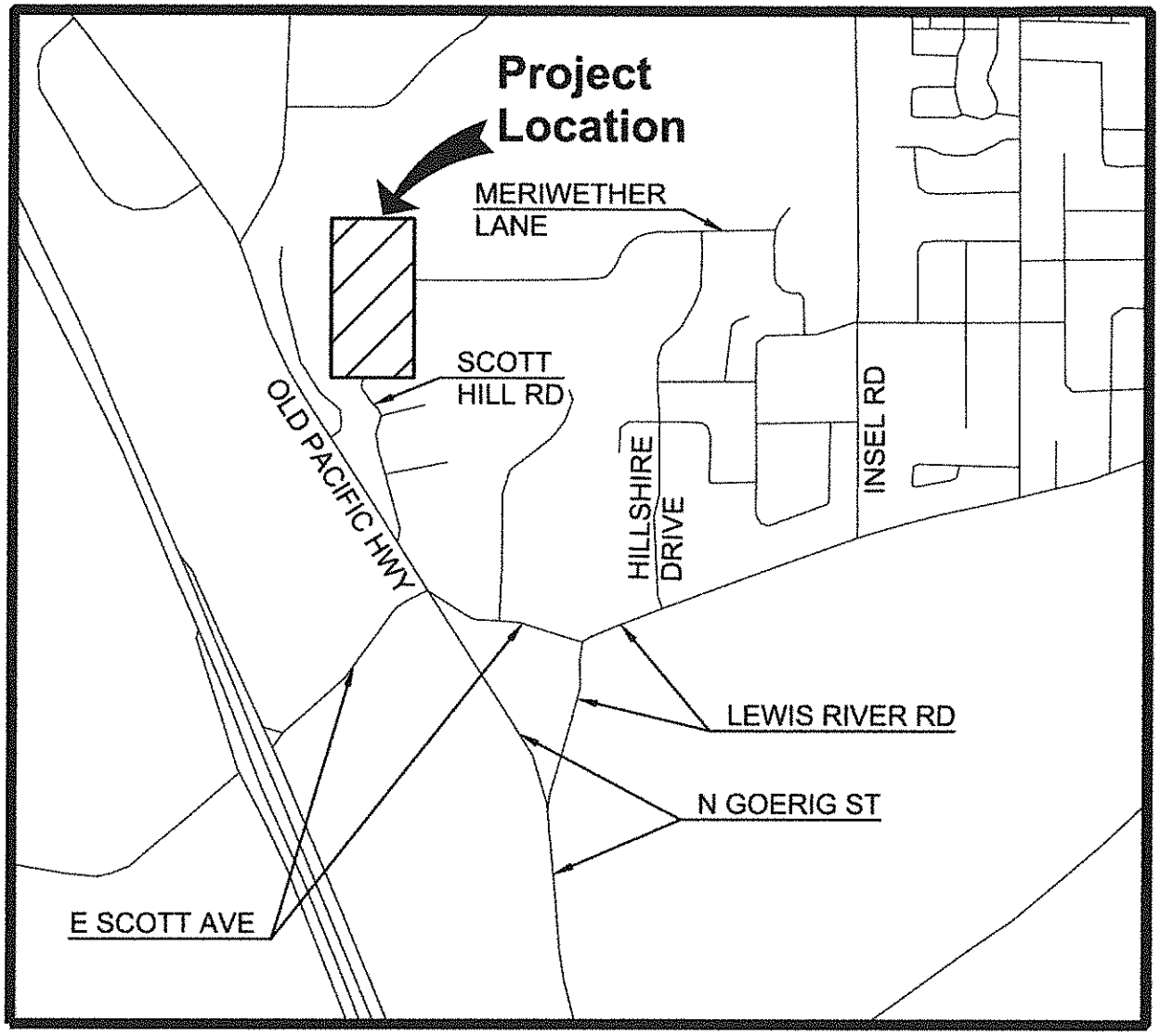

FIGURE 1

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Vicinity Map / Study Area
Scott Hill Park Project - TIA

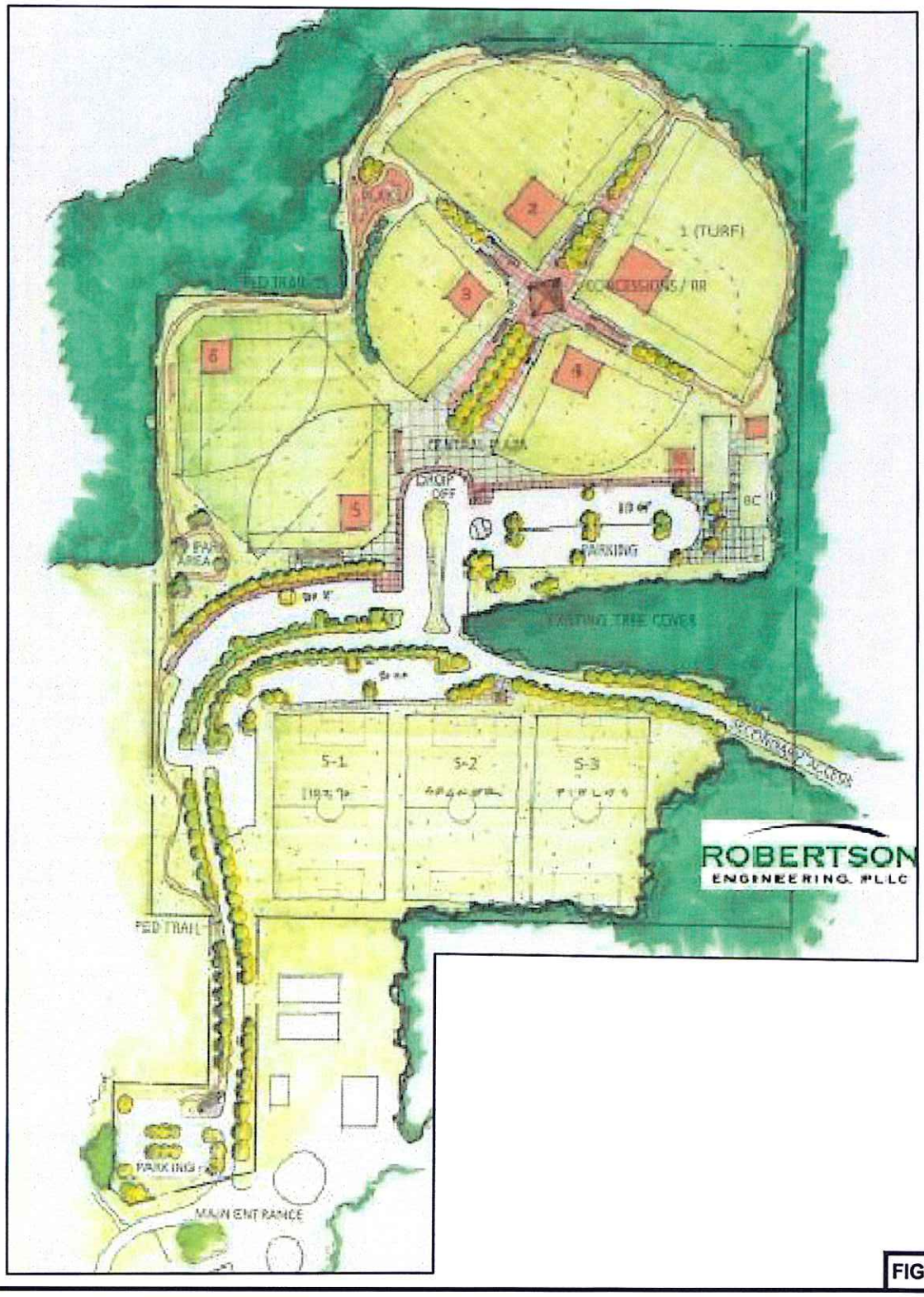

FIGURE 2

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Site Plan
Scott Hill Park Project - TIA

EXISTING CONDITIONS

The existing infrastructure and operational traffic conditions in the vicinity of the site were documented. Roadway conditions were studied to confirm that the roadway is currently operating in a safe and efficient manner. The study area (Figure 1) and the impacted intersections were defined based on information provided by the City of Woodland staff prior to starting the Traffic Impact Analysis (TIA).

EXISTING INFRASTRUCTURE

Land Uses

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

Table 1
Land Use Around The Site

North of Site	
Zoning	UZ
Description	Unzoned Cowlitz County
Existing Use	Residential and Vacant

West of Site	
Zoning	UZ and LDR-8.5
Description	Unzoned and Low Density Res
Existing Use	Residential and Vacant

S I T E

East of Site	
Zoning	LDR-7.2 and 8.5
Description	Low Density Res
Existing Use	Residential and Vacant

South of Site	
Zoning	LDR-8.5
Description	Low Density Res
Existing Use	Residential and Vacant

The site is zoned Public/Quasi-Public Institutional (P/Q-P/I) and currently is vacant.

Existing Roadways

The existing arterial roadways providing access to the site are Old Pacific Highway and Lewis River Road. Data was gathered on these roadways and the study intersection roadways for the purpose of capacity analysis of the existing roadway system. The pertinent information regarding the roadways is tabulated in Table 2.

Table 2
Existing Roadway Information

Roadway Name	Classification	Speed Limit	Lane Configuration	
			Current	Sidewalks/Bike Lanes
Scott Hill Road	Local Access	25 MPH	2 Lanes	No bike lanes, no shoulder, with sidewalk on east side
Old Pacific Highway	Minor Arterial	35 MPH	2 Lanes	No bike lanes, minimal shoulders and no sidewalks
East Scott Avenue	Minor Arterial & Major Collector	25 MPH	2 Lanes	No bike lanes and sidewalk both sides
North Goering Street	Minor Collector	25 MPH	2 Lanes	No bike lanes, no shoulder and no sidewalks
Lewis River Road	Minor Arterial	35 MPH	2 Lanes	No bike lanes and no sidewalks
Hillshire Drive	Local Access	25 MPH	2 Lanes	No bike lanes and sidewalk both sides
Insel Road	Local Access	25 MPH	2 Lanes	No bike lanes and sidewalk on west side (except at SR 503 intersection)

Major Intersections and Traffic Control

The intersections being reviewed in the study area have been identified through communication with the City of Woodland staff. The intersections are:

- *Scott Hill Road/Old Pacific Highway intersection*
- *East Scott Avenue/Old Pacific Highway intersection*
- *Insel Road/Lewis River Road intersection*
- *Hillshire Drive/Lewis River Road intersection*
- *Lewis River Road/North Goerig Street intersection*

The information shown in Table 3 was gathered and is relevant to the analysis of the capacity of the intersections noted above. The information shown below is the existing geometrics and traffic control at these intersections.

Table 3
Major Intersections and Traffic Control

Intersection:	***Scott Hill Road/Old Pacific Highway***			
Weekday PM Peak Hour	4:30 PM - 5:30 PM			
Saturday Peak Hour	12:30 – 1:30 PM			
Leg	**NB**	**SB**	**WB**	
Control	Unc.	Unc.	Stop	
Number of Lanes	1	1	1	

Intersection:	*East Scott Avenue/Old Pacific Highway intersection*			
Weekday PM Peak Hour	4:30 PM – 5:30 PM			
Saturday Peak Hour	12:30 – 1:30 PM			
Leg	**NB**	**SB**	**WB**	**EB**
Control	Stop	Stop	Stop	Stop
Number of Lanes	1	1	1	1

Intersection:	*Insel Road/Lewis River Road intersection*			
Weekday PM Peak	4:30 PM – 5:30 PM			
Saturday Peak Hour	12:30 – 1:30 PM			
Leg:		**SB**	**WB**	**EB**
Control:		Stop	Unc.	Unc.
Number of Lanes:		1	1	1

Intersection:	*Hillshire Drive/Lewis River Road intersection*			
Weekday PM Peak	4:30 PM – 5:30 PM			
Saturday Peak Hour	12:30 – 1:30 PM			
Leg:		**SB**	**WB**	**EB**
Control:		Stop	Unc.	Unc.
Number of Lanes:		1	1	1

Intersection:	*Lewis River Road/North Goerig Street intersection*			
Weekday PM Peak	4:30 PM – 5:30 PM			
Saturday Peak Hour	12:30 – 1:30 PM			
Leg:	**NB**	**SB**	**WB**	**EB**
Control:	Unc.	Unc.		Stop
Number of Lanes:	1	1		1

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 these intersections. The operation of the intersections can be controlled by signing or by signalization. The above table refers to the type of control and the number of approach lanes for each leg of the intersection. The lane configuration for all intersections is shown in Figure 3.

TRAFFIC VOLUMES

Existing traffic volume data is the basis for the analysis of the capacity and safety of the roadway. In-process traffic is the traffic generated by approved projects that have yet to be completed. Thus, the trips from the in-process developments are in addition to the existing traffic volumes. Background traffic growth was estimated for the 20 year design horizon.

Existing Traffic

Traffic volume data was gathered for the major intersections in the site vicinity. During the months of July and September 2015, traffic data was collected at the studied intersections. HDJ

Design Group retained *All Traffic Data* to gather the counts. The July 2015 data was for the Saturday counts. The September 2015 data was for the weekday counts with school in session. The Saturday traffic counts were conducted during the Saturday peak hours of 11:00 AM to 2:00 PM and the weekday PM (4:00-6:00) peak hours (Appendix B). The existing peak hour volumes for the studied intersections are shown in Figure 4.

In-Process Traffic

In-process trips from approved projects were requested from the City of Woodland. The Meriwether subdivision, east of the project site, is noted as the project sending trips through the study area. The in-process trips are included in Appendix A and shown in Figure 5.

This proposal is expected to be completed in 2020. It is not known when the in-process trips will impact the roadway network. For this analysis, it is assumed they will be completed by the 2040 design year horizon used for the future conditions.

Background Traffic

A 2.3% annual growth rate was used to account for background increase of traffic in the area of the site based on discussions with City staff.

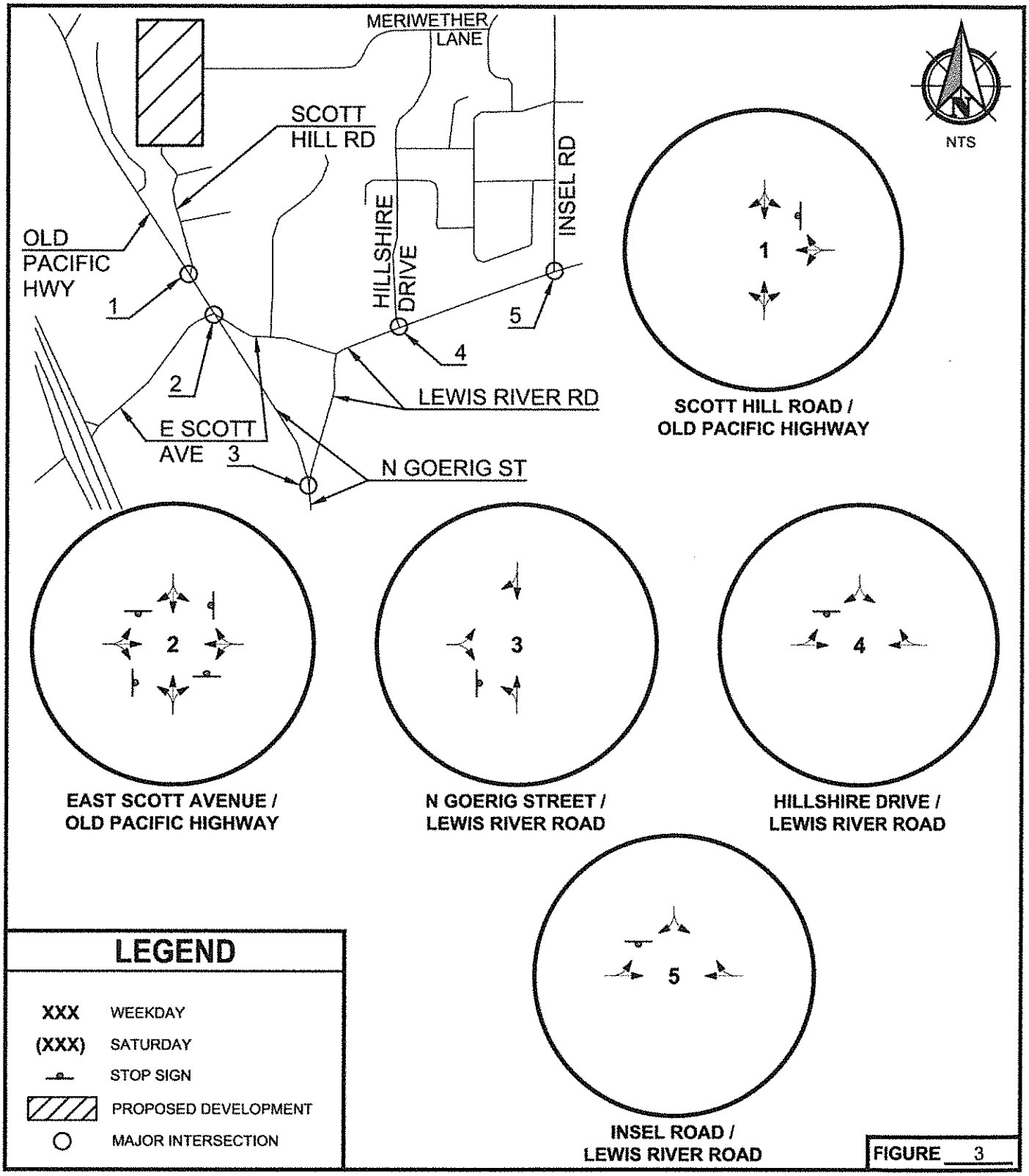

FIGURE 3

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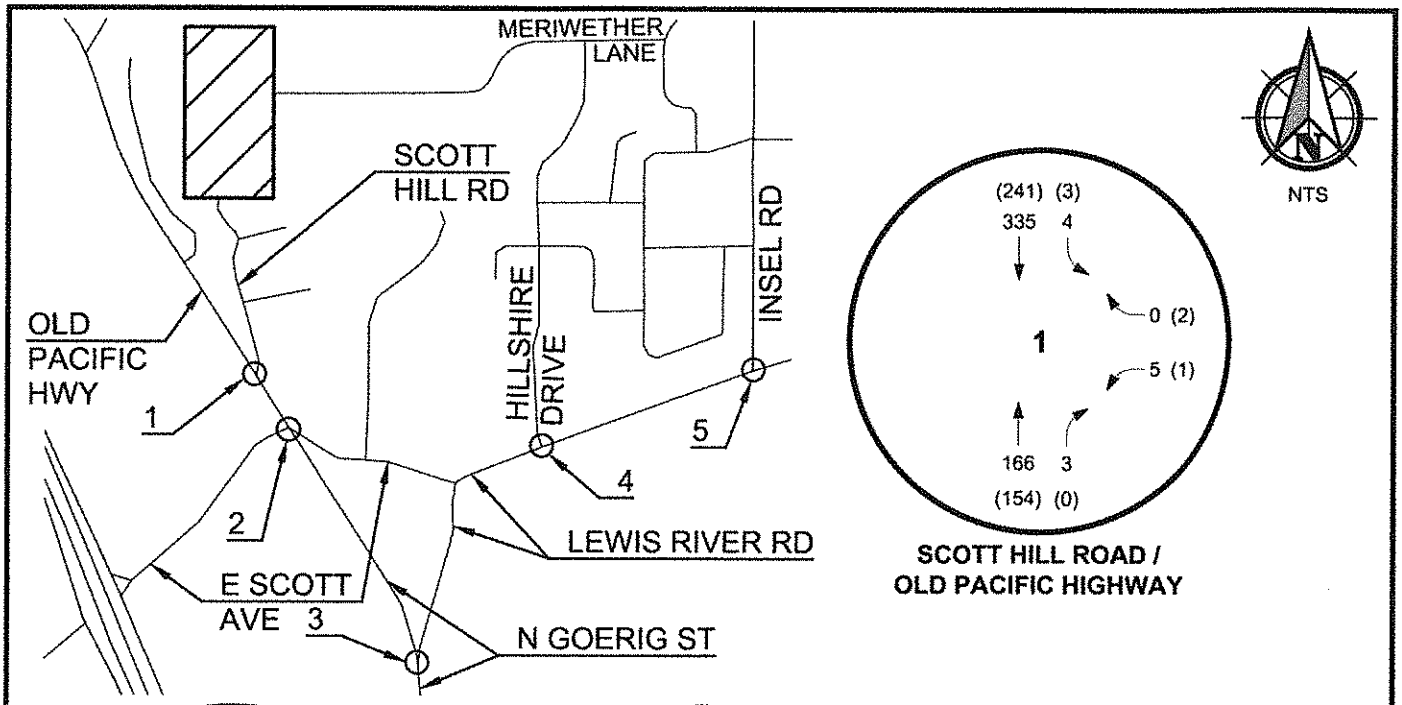
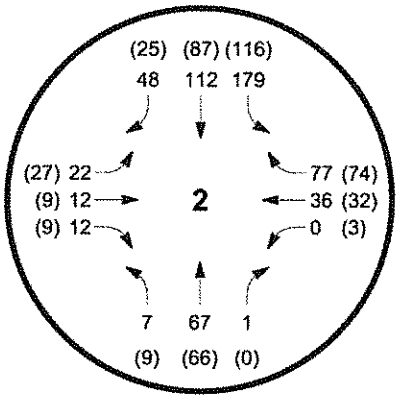
Existing Lane Configuration

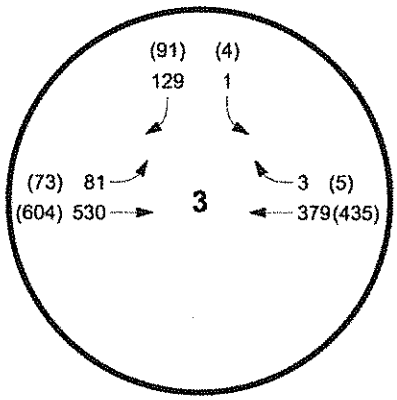
Scott Hill Park Project - TIA



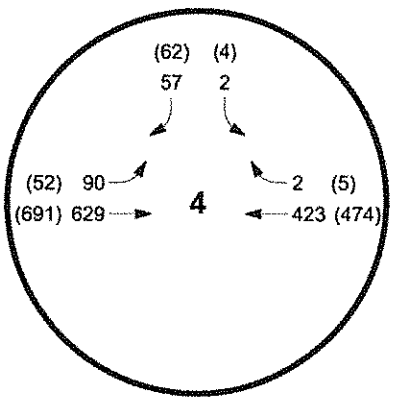
SCOTT HILL ROAD / OLD PACIFIC HIGHWAY



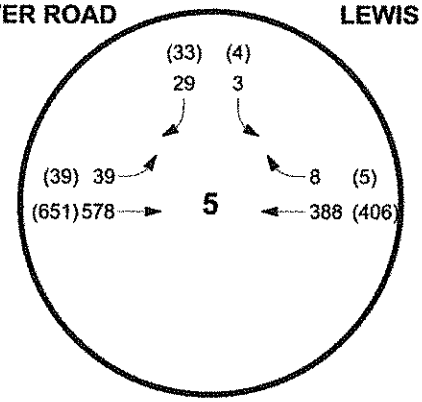
EAST SCOTT AVENUE / OLD PACIFIC HIGHWAY



N GOERIG STREET / LEWIS RIVER ROAD



HILLSHIRE DRIVE / LEWIS RIVER ROAD



INSEL ROAD / LEWIS RIVER ROAD

LEGEND

XXX	WEEKDAY
(XXX)	SATURDAY
	STOP SIGN
	PROPOSED DEVELOPMENT
	MAJOR INTERSECTION

FIGURE 4

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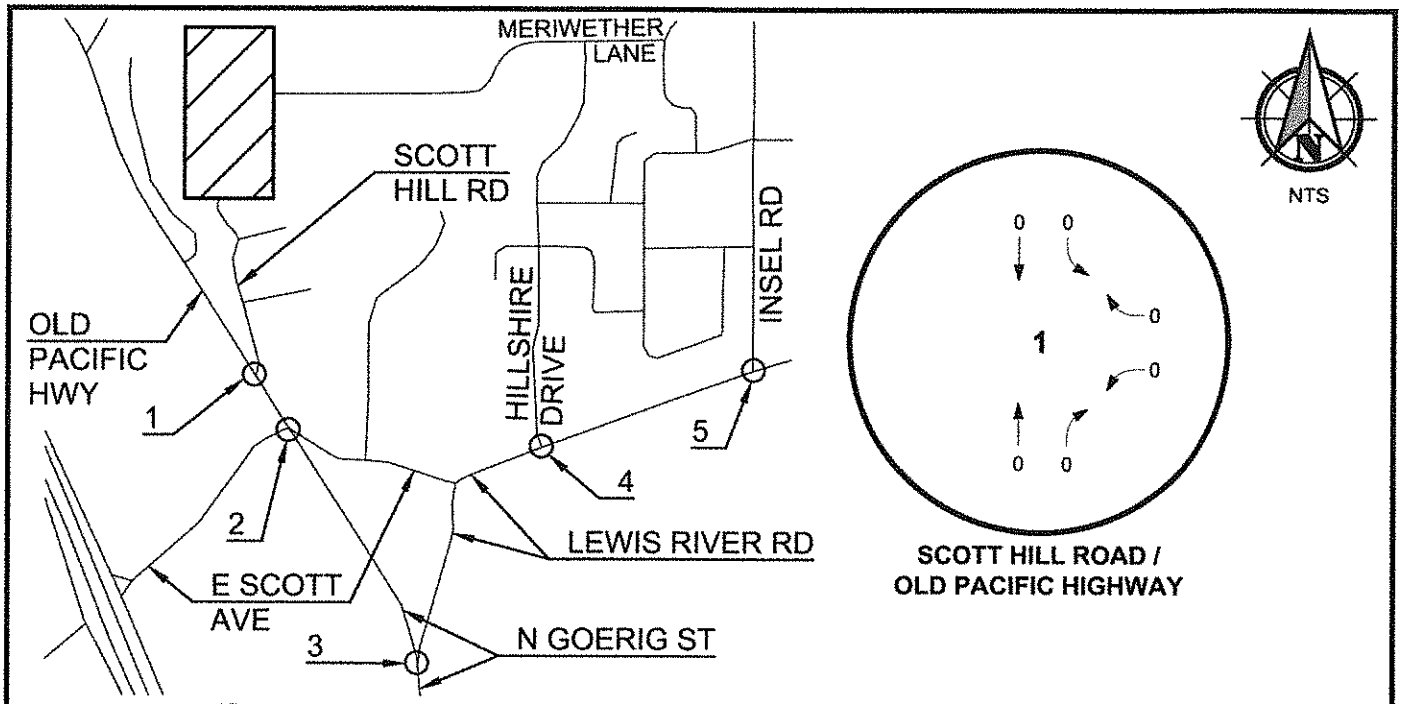
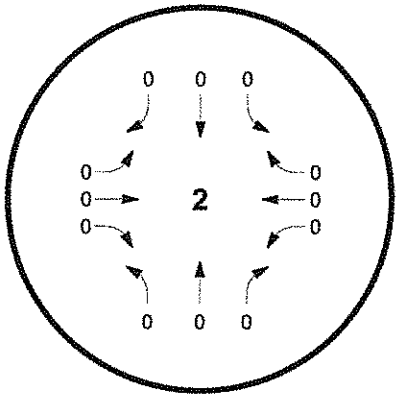
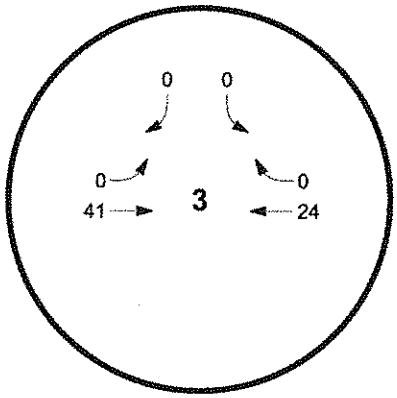
Existing 2015 PM Peak Hour Volumes
Scott Hill Park Project - TIA



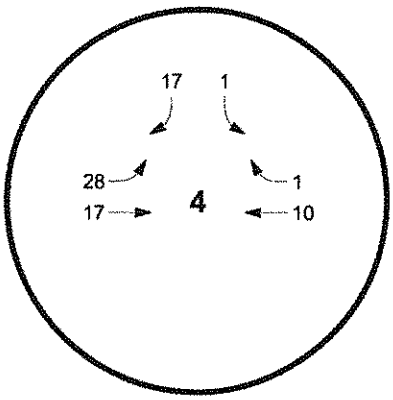
SCOTT HILL ROAD / OLD PACIFIC HIGHWAY



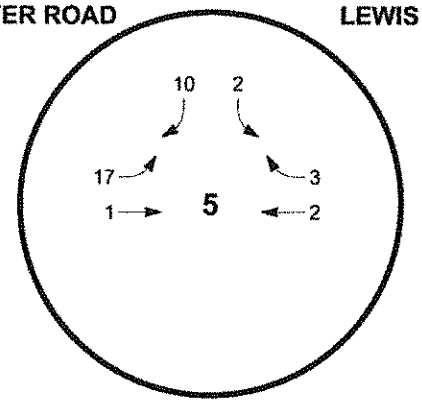
EAST SCOTT AVENUE / OLD PACIFIC HIGHWAY



N GOERIG STREET / LEWIS RIVER ROAD



HILLSHIRE DRIVE / LEWIS RIVER ROAD



INSEL ROAD / LEWIS RIVER ROAD

LEGEND

XXX	WEEKDAY
	STOP SIGN
	PROPOSED DEVELOPMENT
	MAJOR INTERSECTION

FIGURE 5

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2040 PM Peak Hour In-Process Trips

Scott Hill Park Project - TIA

PROPOSED CONDITIONS

The proposed development will add traffic to the roadway system. Where the project is located, the size of the project, and when it will be completed are all important elements that need to be considered to determine the impacts of this development on 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. Furthermore, this section will address any funded infrastructure changes planned by other agencies or developers. All of the above elements are important in assessing the traffic impacts of this project.

PROJECT DESCRIPTION

This proposal would develop an undeveloped site of approximately 40 acres. The site is located in Section 47, Township 5 North, Range 1 West of the Willamette Meridian. The project proposes to access Scott Hill Road through a new roadway and completion of a dead-end roadway connection to Meriwether Lane. This project is scheduled for completion in 2020. This report analyzes the traffic impacts generated by the completed development as required by the City and after consultation with City staff.

The proposed development will consist of six ballfields, three soccer fields, a playground, a large covered area with restrooms, walking trails and work-out stations, concessions, batting cages and picnic areas. The anticipated parking is 45 spaces per sports field, for approximately 405 parking spaces.

Access

Properly located access points are essential to allow for the safe and orderly movement of traffic in and out of a site. There will be two new access points, one that will connect to the existing Scott Hill Road and one that will connect to the dead end of Meriwether Lane.

TRIP GENERATION AND DISTRIBUTION

Trip Generation

After reviewing the ITE land use code 411, City Park, it was determined that the ITE land use code 488 most closely resembles this specific development. Trip generation estimates were prepared for the proposed development (Appendix A). For the purposes of this study the City recommended the "Hazel Dell Sports Field" in Clark County be used as a comparison to the ITE Trip Generation Manual, 9th Edition, land use code (488), Soccer Complex trip generation.

New weekday trips generated by the project are shown in Table 4. New Saturday trips generated by the project are shown in Table 5. The comparison trip generation rate for the Hazel Dell Sports Field is shown in Table 6.

Table 4
ITE Trip Generation Weekday

Land Use:	Soccer Complex			
Weekday ADT	488			
Total Peak Hour Trips:	AM		PM	
In	57%	5	67%	95
Out	43%	4	33%	47
Total:	100%	9	100%	142

Table 5
ITE Trip Generation Saturday

Land Use:	Soccer Complex	
Saturday ADT	488	
Total Peak Hour Trips:	Peak	
In	48%	117
Out	52%	126
Total:	100%	243

Table 6
Hazel Dell Sports Field Trip Generation

Sports Group	Peak Hour Trips per Field	Total Peak Hour Trips – 8 Fields
T-ball	35	280
A	35	280
AA	40	320
Major	41	328
Junior/Senior	40	320
High School	40	320
Average Trips	39	308

The Hazel Dell Sports Field trip generation trips estimate was created prior to the addition of the ITE land use code 488 contained within the 9th Generation Manual. The ITE land use code 488 is the current best available data and as such, was used for this report. Table 6 is being used for comparison purposes only.

Trip Distribution

The trip distribution is based on the anticipated travel between the sports field, local intra-city trips, trips from adjacent communities that will utilize I-5 to access Scott Hill Park, discussions with City staff, and engineering judgment. All traffic accessing the site from Meriwether Lane will be from the large residential neighborhood east of the site.

All out of town traffic will access the site via Scott Hill Road. The City of Woodland will be installing directional signing for northbound I-5 traffic to follow Atlantic Street to East Scott Avenue to Old Pacific Highway and up Scott Hill Road to the Scott Hill Parks. Site generated trips and distribution are shown in Figure 6.

PROPOSED INFRASTRUCTURE

Roadways and Intersections

A roundabout was constructed at the intersection of Lewis River Road and East Scott Avenue in September 2015. With exception of the roundabout construction, there have been no recent improvements to the study intersections or roadways in the project vicinity.

There are several infrastructure improvements noted in the Woodland Transportation Infrastructure Strategic Plan dated November 2008 and the Six Year Transportation Improvement Program From 2015 to 2020 in the project vicinity.

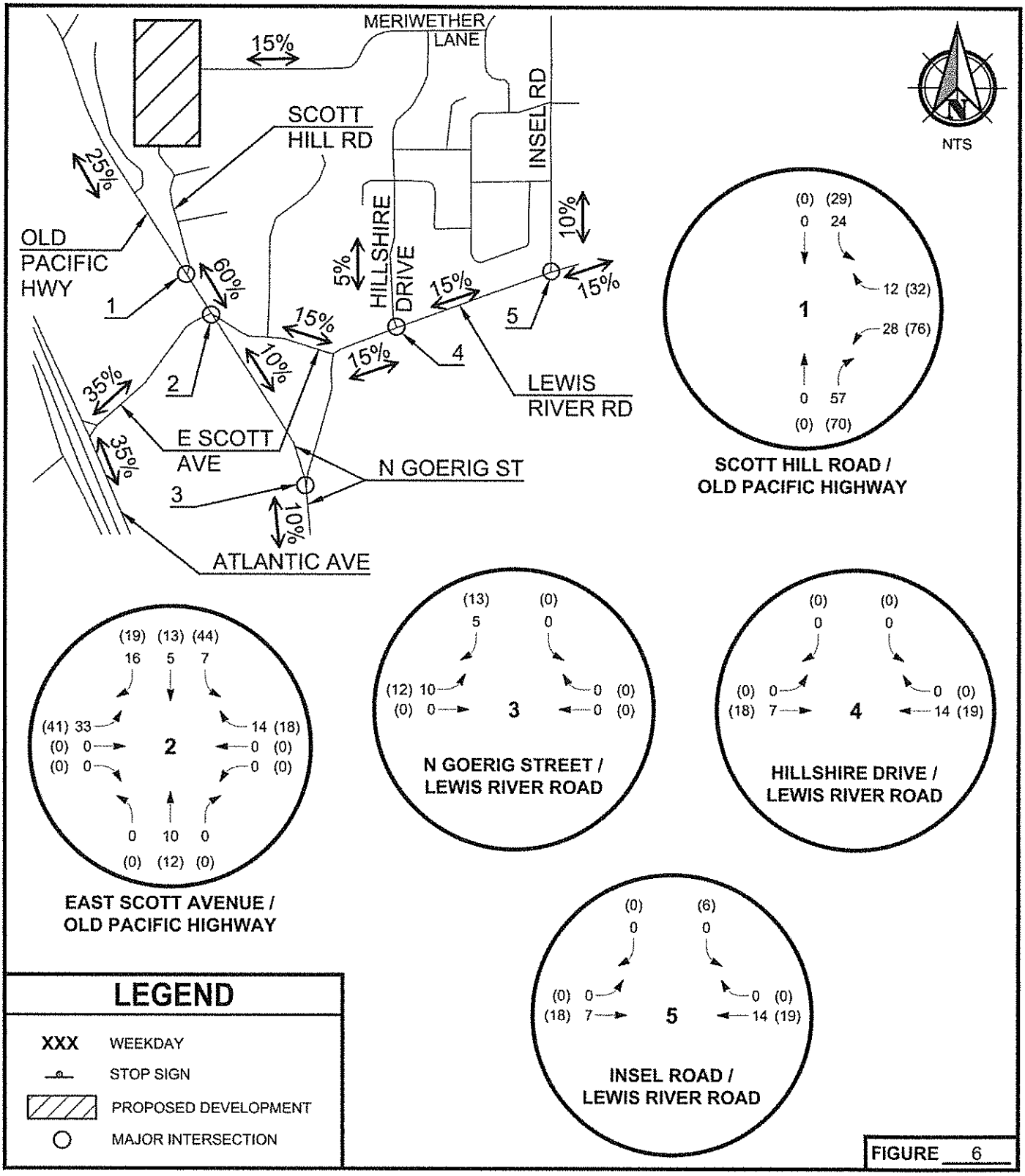

FIGURE 6

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2040 Site Generated Trips and Distribution

Scott Hill Park Project - TIA

CAPACITY ANALYSIS

DESCRIPTION

Traffic operations are assessed in terms of level of service (LOS). LOS is a concept that was developed by transportation engineers to qualify 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.

LOS at un-signalized intersections is quantified in terms of average delay per vehicle. A LOS "A" reflects full freedom of operation for a driver while a LOS "F" represents operational failure. The criteria is based on the theory of gap acceptance for side street stop sign controlled approaches. A detailed description of LOS criteria is provided in Appendix C.

Generally, LOS "D" and LOS "E" are considered the thresholds of acceptable operation for signalized and un-signalized intersections, respectively. This report is based on Transportation Impact Study guidelines from the City of Kelso used in the *Woodland High School Campus Traffic Impact Analysis (TIA),* as directed by the City of Woodland. Per this policy, LOS "D" in the peak hour is considered the minimum acceptable operation at signalized intersections. LOS "E", is acceptable for un-signalized arterial approaches that do not meet signal warrants; or in locations where signal installation is not desired per an approved access management plan for the specific corridor.

ANALYSIS METHODOLOGY

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

- *The proposed development will be completed in 2020.*
- *Existing background traffic on the study area roadways will grow by 2.3% per year.*
- *Traffic generation estimates for the project have been prepared for a twenty year design horizon. These estimates were prepared for the weekday PM peak hour and the Saturday PM peak, on the surrounding street system.*
- *Background traffic volumes on the surrounding street system have been determined prior to adding the traffic impacts of the proposed project. This was done to establish a baseline for measurement of the impact of the project at the time of its development. Background traffic volume estimates were prepared for a twenty year design horizon.*
- *Cumulative traffic impacts of the proposed project were determined by superimposing the project-generated traffic onto the background weekday PM peak and Saturday PM peak traffic and analyzed.*
- *The LOS was calculated with Traffix Software for all intersections.*

The current LOS (calculations can be found in Appendix D) for the study area intersections that have been evaluated for the previously defined peak hours. The findings are listed in Table 7.

LEVEL OF SERVICE ANALYSIS

Existing Conditions

Table 7
Estimated Existing Level Of Service
For Study Area Intersections

INTERSECTION *(critical movement)*	**Existing Level of Service**			
	PM Peak Hour		**Saturday Peak Hour**	
	LOS	***Delay (sec)***	***LOS***	***Delay (sec)***
Scott Hill Road/Old Pacific Highway	B	12.2	A	10.0
East Scott Avenue/Old Pacific Highway	A	9.7	A	8.9
Insel Road/Lewis River Road	B	11.8	B	12.5
Hillshire Drive/Lewis River Road	B	12.1	B	13.9
Lewis River Road/North Goerig Street	B	12.1	B	13.9

As shown in Table 7, all studied intersections currently operate at an acceptable level of service.

2020 Year of Opening Conditions

Table 8
Estimated 2020 Level Of Service
For Study Area Intersections

INTERSECTION *(critical movement)*	**2020 Level of Service**			
	PM Peak Hour		**Saturday Peak Hour**	
	LOS	***Delay (sec)***	***LOS***	***Delay (sec)***
Scott Hill Road/Old Pacific Highway	B	13.5	B	14.6
East Scott Avenue/Old Pacific Highway	B	11.3	B	10.7
Insel Road/Lewis River Road	B	13.5	B	13.8
Hillshire Drive/Lewis River Road	B	14.0	C	15.8
Lewis River Road/North Goerig Street	B	13.4	C	15.8

Table 8 shows that the 2020 year of opening level of service conditions for the study intersections will all operate at an acceptable LOS.

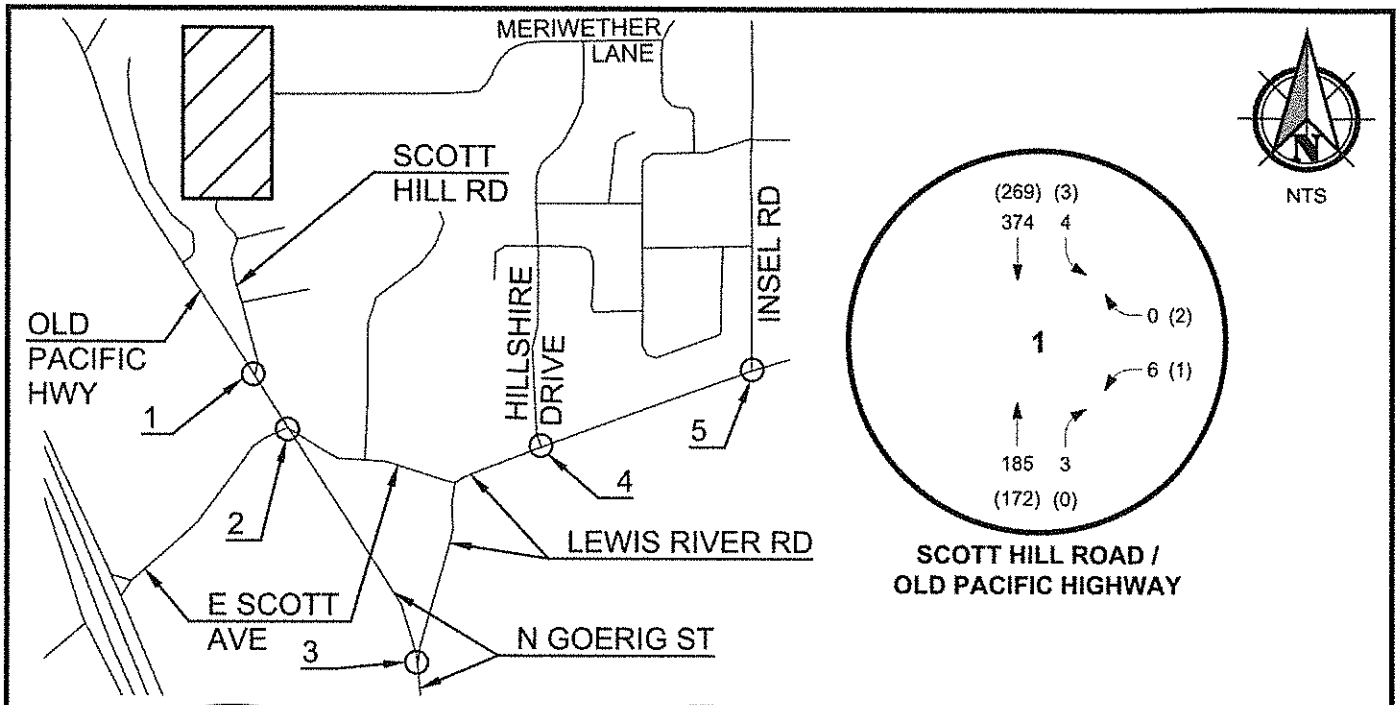
2040 Design Year Conditions

Table 9
Estimated 2040 Level Of Service
For Study Area Intersections

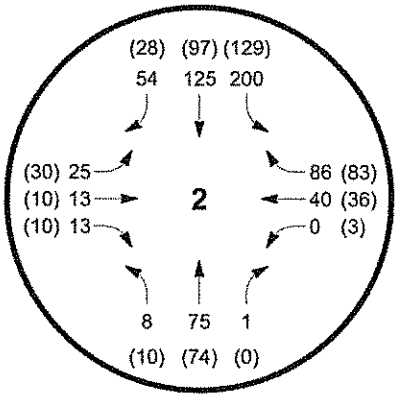
INTERSECTION *(critical movement)*	2040 Level of Service			
	PM Peak Hour		Saturday Peak Hour	
	LOS	*Delay (sec)*	*LOS*	*Delay (sec)*
Scott Hill Road/Old Pacific Highway	C	17.4	C	18.9
East Scott Avenue/Old Pacific Highway	C	19.6	C	15.2
Insel Road/Lewis River Road	C	19.1	C	20.9
Hillshire Drive/Lewis River Road	C	21.7	D	30.7
Lewis River Road/North Goerig Street	C	20.5	D	34.9

Table 9 shows that the 2040 design horizon year level of service conditions for the study intersections are all at an acceptable LOS.

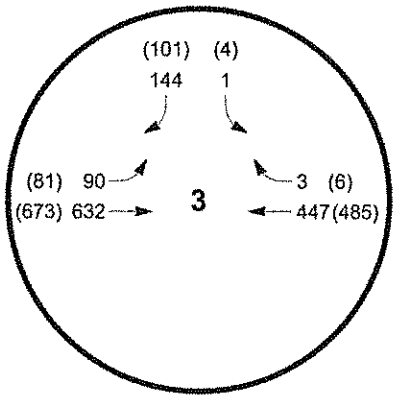
Year of opening (2020) and the design year (2040) traffic volumes without and with the project are shown in Figures 7 to 10, including the in-process project trips with the annual background growth rate of 2.3%.



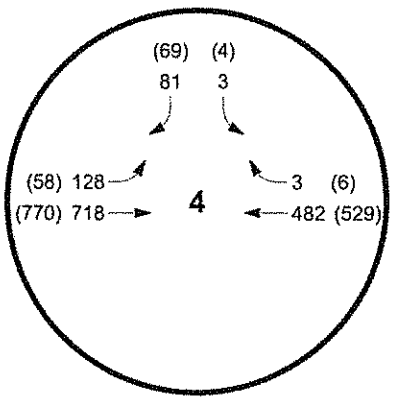
SCOTT HILL ROAD / OLD PACIFIC HIGHWAY



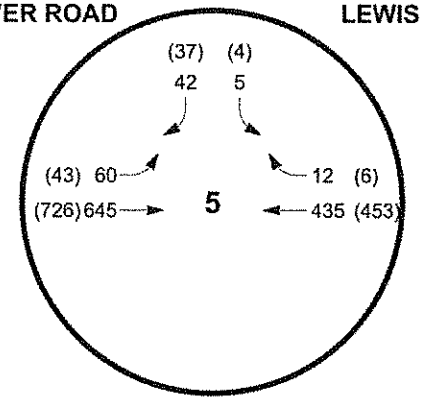
EAST SCOTT AVENUE / OLD PACIFIC HIGHWAY



N GOERIG STREET / LEWIS RIVER ROAD



HILLSHIRE DRIVE / LEWIS RIVER ROAD



INSEL ROAD / LEWIS RIVER ROAD

LEGEND

XXX	WEEKDAY
(XXX)	SATURDAY
	STOP SIGN
	PROPOSED DEVELOPMENT
	MAJOR INTERSECTION

FIGURE 7

HDJ DESIGN GROUP PLLC
engineers | landscape architects | planners | surveyors
314 W 15th Street
Vancouver, WA 98660-2927
360-695-3488
503/924-4005
360-695-8767 fax
Internet: www.hdjdg.com

2020 Peak Hour Volumes Without Project

Scott Hill Park Project - TIA

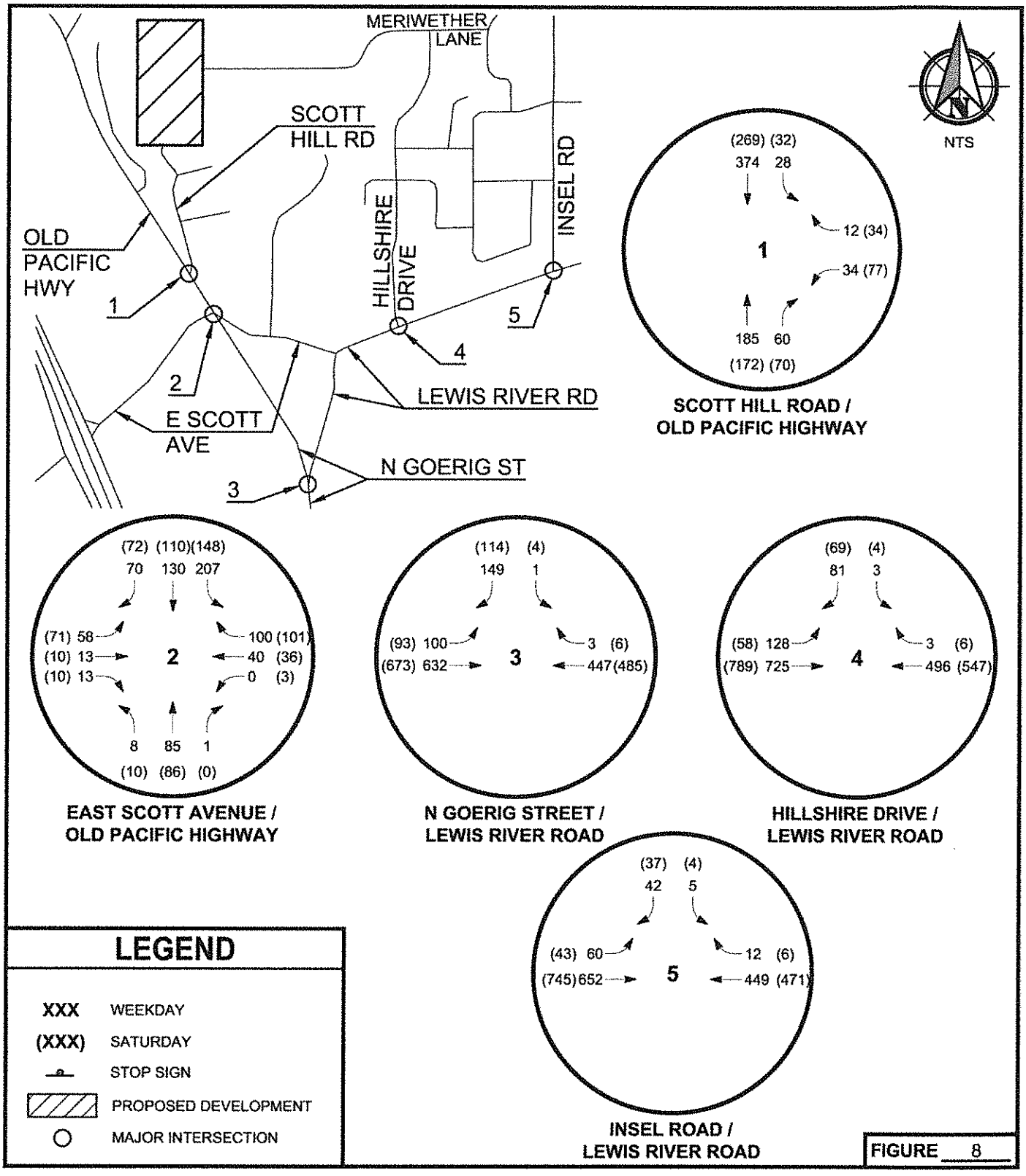


FIGURE 8

HDJ DESIGN GROUP
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2020 Peak Hour Volumes With Project

Scott Hill Park Project - TIA

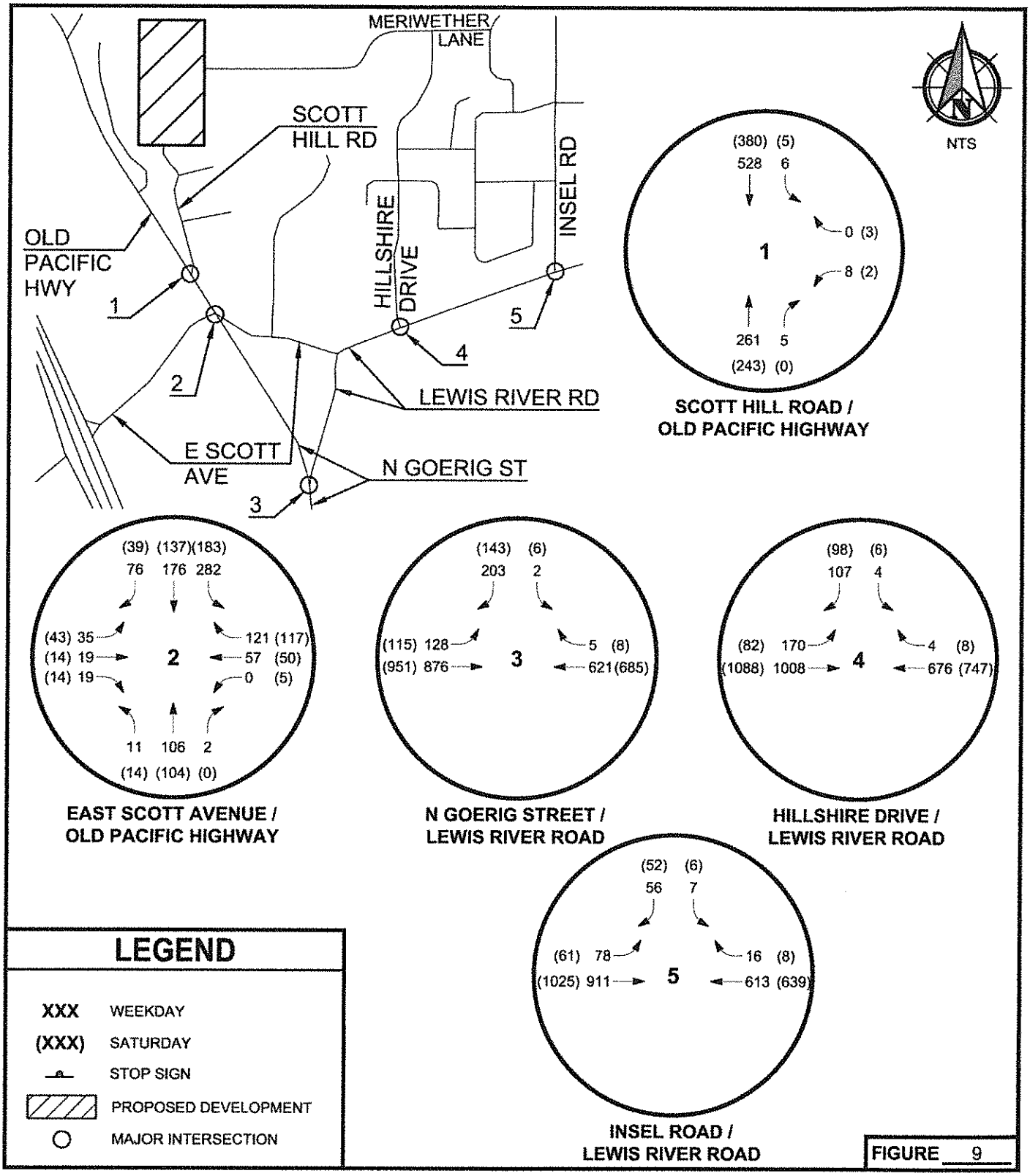

FIGURE 9

HDJ DESIGN GROUP
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360/695-3488
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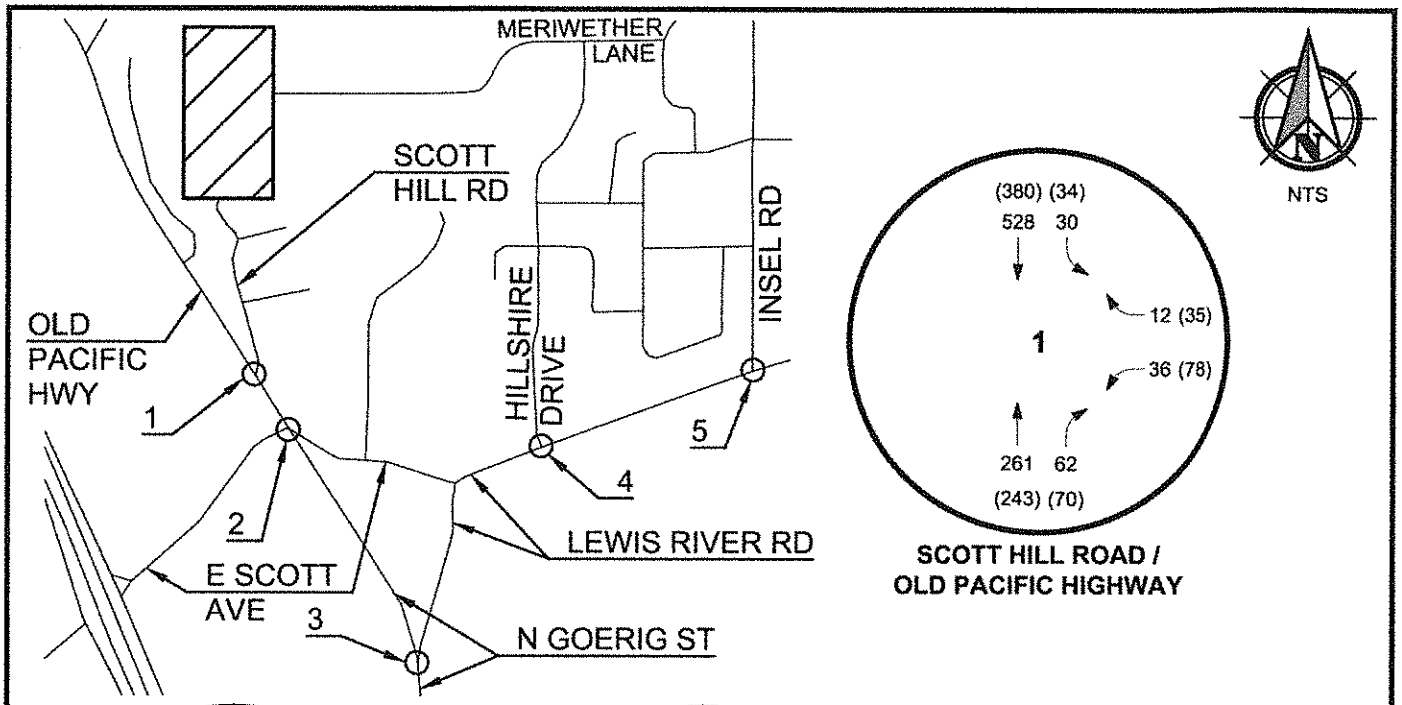
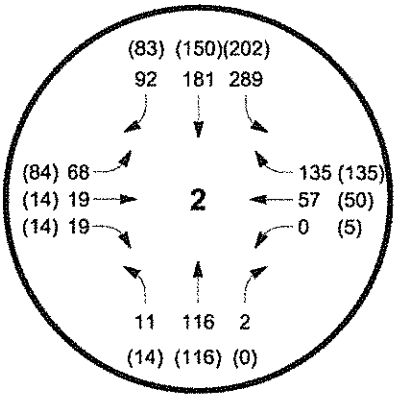
2040 Peak Hour Volumes Without Project

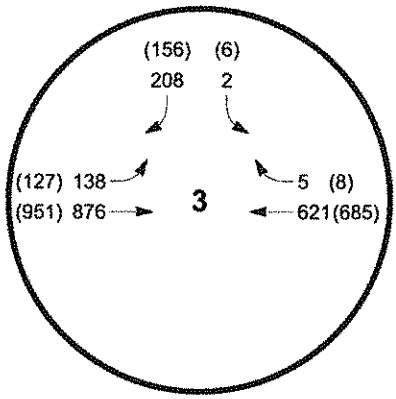
Scott Hill Park Project - TIA



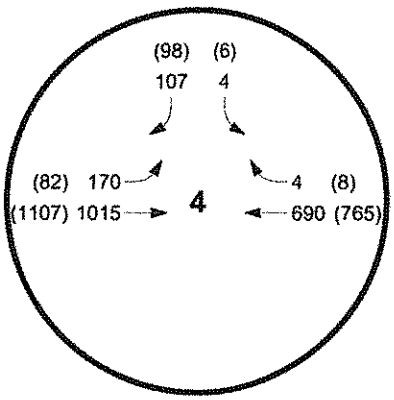
SCOTT HILL ROAD / OLD PACIFIC HIGHWAY



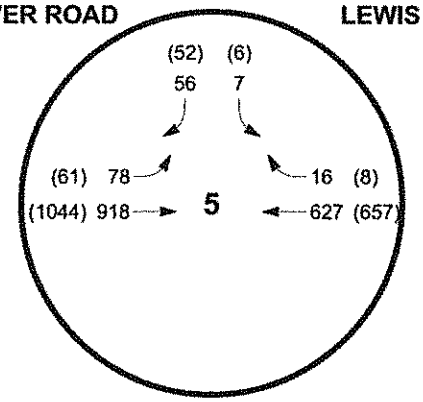
EAST SCOTT AVENUE / OLD PACIFIC HIGHWAY



N GOERIG STREET / LEWIS RIVER ROAD



HILLSHIRE DRIVE / LEWIS RIVER ROAD



INSEL ROAD / LEWIS RIVER ROAD

LEGEND

XXX	WEEKDAY
(XXX)	SATURDAY
	STOP SIGN
	PROPOSED DEVELOPMENT
	MAJOR INTERSECTION

FIGURE 10

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2040 Peak Hour Volumes With Project

Scott Hill Park Project - TIA

LEFT TURN STORAGE ANALYSIS

The intersection of Hillshire Drive and Lewis River Road is the only study intersection with an existing left turn pocket. An analysis was performed on remaining the study intersections. Left turn lanes are typically justified based on either safety or capacity. The capacity analysis identifies the need for left turns at the stop controlled or uncontrolled legs of an intersection. Safety is usually the major justification for left turn lanes on uncontrolled legs of an intersection.

The criteria for the analysis of left turn lanes at uncontrolled intersection legs is based on the WSDOT Design Manual for Left-turn Storage Guidelines: Two-lane Unsignalized Intersections (Exhibit 1310-7a). See Appendix F for Exhibit 1310-7a graphic, for the left turn storage analysis, with and without project. No restrictive geometrics are present that require a left-turning vehicle to slow greatly below the speed of through traffic.

Table 10
Left Turn Storage Analysis With and Without the Project

	2040 PM Weekday With Project	2040 PM Weekday Without Project	2040 PM Saturday With Project	2040 PM Saturday Without Project
Scott Hill Road/Old Pacific Highway				
SB Left-turning Volume % Total DHV Turning	3%	1%	5%	1%
Peak Hour Total Volume – Both Directions	881	800	727	627
Consider Left Turn Storage	No	No	No	No
Insel Road/Lewis River Road				
EB Left-turning Volume % Total DHV Turning	5%	5%	3%	4%
Peak Hour Total Volume – Both Directions	1639	1618	1770	1733
Consider Left Turn Storage	Yes*	Yes*	Yes*	Yes*
Lewis River Road/North Goerig Street				
NB Left-turning Volume % Total DHV Turning	8%	8%	7%	7%
Peak Hour Total Volume – Both Directions	1640	1630	1771	1759
No Left Turn Storage Needed	Yes*	Yes*	Yes*	Yes*

* The project alone does not create a need for left turn storage at either the Scott Hill Road/Old Pacific Highway or Lewis River Road/North Goering Street intersection, as shown in Table 10.

The installation of a left turn lane should be considered with or without the project in the 2040 design year at the Insel Road/Lewis River Road intersection. No left turn lanes or further left turn analysis are recommended for this project.

RIGHT-TURN TREATMENT 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). This guidance 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 speed of all study roadways are 35 mph and below. With all study roadway intersections being below the 45 mph threshold noted in the WSDOT Design manual Right-turn Lane Guidelines, neither right-turn lane analysis or right-turn lanes are recommended for this project.

COLLISION ANALYSIS

Collision data (1/2010 to 4/2015) was requested and obtained from the Washington State Department of Transportation (WSDOT). The analysis is based on the assumption 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 accident data can be found in Appendix E. The results of the accident analysis are shown in Table 12.

Table 12
Collision Analysis For Scott Hill Park Project Study
Intersections (1/2010 to 4/2015)

COLLISION TYPE	Scott Hill Road/Old Pacific Highway	*East Scott Avenue/Old Pacific Highway	Insel Road/Lewis River Road	Hillshire Drive/Lewis River Road	Lewis River Road/North Goerig Street
Rear-end	0	1	0	0	0
Entering at angle	0	3	0	0	0
Sideswipe	0	0	0	0	0
Approach turn	0	0	0	0	1
Vehicle bicycle	0	0	0	0	0
Fixed Object	0	0	0	0	0
TOTAL COLLISIONS	**0**	**4**	**0**	**0**	**1**
CRITICAL RATE	**N/A**	**0.95**	**N/A**	**N/A**	**0.85**
COLLISION RATE	**N/A**	**.038**	**N/A**	**N/A**	**0.05**

*This intersection is composed of "Old Pacific Highway/East Scott Avenue/North Goerig Street.

A full five years of collision data from WSDOT was analyzed for this report. To calculate the collision rate, PM Peak Hour turning movement counts were summed for each approach and multiplied by 10 to provide an approximation of the Average Daily Traffic. The calculation of the critical and collision rate are in Appendix E.

The collision history at the study intersections does not have a collision rate higher than the critical rate and there were no severe or fatal injury types. All of the intersections are lower than the critical collision rate and no further review is recommend.

TRANSIT, PEDESTRIAN, AND BICYCLE FACILITIES

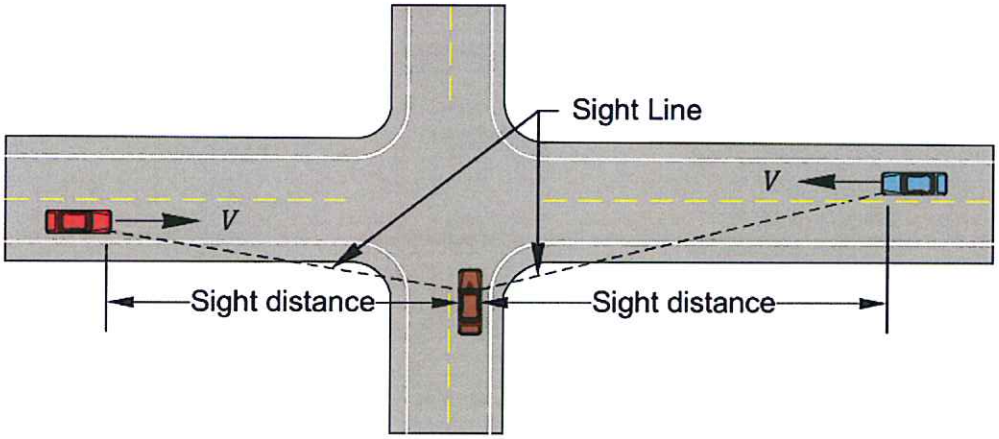
The primary access roadways, Old Pacific Highway and Lewis River Road are two lane roadways, without sidewalks. Old Pacific Highway does not have shoulders, while Lewis River Road does have shoulders. For pedestrians and bicyclists, there are no sidewalks or bicycle lanes and there are no transit services serving the City. The pedestrian and bicycle activity to and from the site is anticipated to be light.

All sidewalk and driveway constructed for the Scott Hill Park Project should meet ADA requirements.

SIGHT DISTANCE AT SITE ACCESS LOCATIONS

The proposed site access points onto Scott Hill Road and Meriwether Lane will need approximately 185 feet of sight distance to meet stopping and intersection sight distances for AASHTO based on the posted speed of 25MPH.

Neither of the access points currently exist. When the project and the associated access points are constructed, they will need to meet the sight distance noted above. Also, the final design should assure sight distance triangle remains unrestricted.



STUDY CONCLUSIONS

The findings of the Traffic Impact Analysis are listed below:

1. A background annual growth rate of 2.3% is expected in the area. This analysis assumes the approved projects will be complete in the 2040 design horizon year.

2. All studied intersections will operate at an acceptable level of service (LOS) in the 2040 design year with or without the project.

3. No left or right turn lanes, nor further turn analysis are recommended.

4. The 2010-2015 collision history at the study intersections was reviewed. The proposed project will not have a significant impact on traffic safety at the studied intersections, as the project traffic volumes increase is marginally larger than the 2040 volumes without the project. Currently, all intersections reviewed in the project study area have collision rates lower than the critical rate. No further analysis is recommended.

5. The Lewis River Road (SR 503)/N Goerig Street intersection angle does not meet the WSDOT Design Manual guideline minimums. This is an existing condition that does not appear to have contributed to collisions at this location. No further analysis is recommended

6. There is no public transit within walking distance of the proposal. There is transit service to the Woodland Park and Ride lot near I-5, approximately 1-1/2 miles away. The community at large does not have transit service. The park and ride lot transit service is provided by Lower Columbia Action Program (CAP). The existing transit service will not be extended due to the implementation of the Scott Hill Park Project.

7. Direct access to the Scott Hill Park project site currently does not exist. When the site roadways are designed, they will need to be designed to follow AASHTO requirements for stopping and intersection sight distance.

PROJECT-RELATED IMPROVEMENTS

RECOMMENDATIONS

The traffic impact analysis supports the following recommendations:

Design the site access points to Scott Hill Road and Meriwether Lane to follow AASHTO requirements for stopping and intersection sight distance.

Do not install objects within the sight distance triangle that would block the drivers view exiting the site at either new access point onto Scott Hill Road or Meriwether Lane.

All sidewalks and driveways constructed will need to be ADA compliant.

Install directional signing to the Scott Hill Park, per City of Woodland, at the following intersections:

- I-5 NB off-ramp/SR 503/Atlantic Avenue
- Atlantic Avenue/East Scott Avenue
- East Scott Avenue/Old Pacific Highway
- Old Pacific Highway/Scott Hill Road

REFERENCES

1. *Highway Capacity Manual*, 2000 Transportation Research Board, National Research Council.

2. *Trip Generation Manual*, Ninth Edition, 2012, Institute of Transportation Engineers.

3. *Manual on Uniform Traffic Control Devices*, 2009 Edition, Federal Highway Administration.

4. *Walla Walla Urban Area Transportation Impact Analysis Guidelines Walla Walla WA*, June 2004, *City* of Walla Walla Engineering Division

5. *Traffic Access and Impact Study for Site Development, A Recommended Practice*, 1991, Institute of Transportation Engineers.

6. *A Policy on The Geometric Design of Highways and Streets*, 2011, American Association of State Highway Transportation Officials.

7. *WSDOT Highway Design Manual*, July 2014, Washington State Department of Transportation.

8. *Woodland Transportation Infrastructure Strategic Plan*, November 2008, City of Woodland

9. *Woodland Transportation Infrastructure Strategic Plan – Final Existing Conditions Technical Memorandum*, August 2007, Cowlitz-Wahkiakum Council of Governments

10. *Woodland Zoning Map*, March 2015, City of Woodland

11. *Resolution No. 645*, June 2, 2014, Transportation Improvement Program for Years Beginning 2015 and ending 2020, City of Woodland