

# Troutdale Village Transportation Analysis

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## EXECUTIVE SUMMARY

### Purpose of the Report

The purpose of this transportation analysis (TA) report is to identify and document potential traffic deficiencies related to the proposed Troutdale Village project in the City of La Quinta. This technical report will also recommend transportation improvements to address potential project deficiencies to local and regional transportation facilities.

### Project Overview

The project will be developed on a vacant site located on the northeast corner of Washington Street and Avenue 50. Access to the project site will be provided via two driveways along Washington Street and Avenue 50 respectively. The subject project is proposing the construction of eleven (11) residential buildings including sixty-eight (68) multifamily (low-rise) housing units, two hundred and sixteen (216) multifamily (mid-rise) housing units (63 affordable housing units) and one (1) clubhouse with amenities.

The project trip generation was calculated using the ITE Trip Generation Manual (10<sup>th</sup> Edition). It is estimated that the project will generate 1,684 total daily trips, 109 AM peak hour trips and 134 PM peak hour trips. Project trip distribution and assignment were developed, in coordination with the City of La Quinta staff, based on the land use characteristics of the proposed project and surrounding area, existing travel patterns within the study area, anticipated travel patterns to and from the project site, and approved projects located in the vicinity of the project site. Project scenarios and study area were then established in coordination with City staff to determine the potential project deficiencies on the transportation network. Refer to **Appendix A** for approved scoping agreement.

### Project Scenarios:

- Existing Conditions (2021)
- Project Completion Year 2023 (Existing Plus Ambient Plus Project) Conditions
- Cumulative (Existing Plus Ambient Plus Cumulative Plus Project) Conditions

### Study Area Intersections:

1. Washington Street and Avenue 50
2. Washington Street and Eisenhower Drive
3. Washington Street and Avenue 48

## Analysis Results and Recommendations

### Existing Conditions (2021) Scenario

All study area intersections operate at acceptable level of service (LOS) under Existing Conditions 2021. Therefore, no improvements are required by this project.

### Project Completion Scenario

All study area intersections operate at acceptable LOS under Project Completion Conditions. Therefore, no improvements are required by this project.



**Cumulative Scenario**

All study area intersections operate at acceptable LOS under Cumulative. Therefore, no improvements are required by this project.

**Vehicle Miles Traveled**

Per the City of La Quinta Vehicle Miles Traveled (VMT) Analysis Policy (June 2021), the project can be presumed to not have a significant transportation related CEQA impact by qualifying for the small project screening criterion as an affordable housing and small project.



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## 1.0 PROJECT INTRODUCTION

This transportation analysis (TA) report has been prepared for Troutdale Village project. The project will be developed on a vacant site located at the northeast corner of Washington Street and Avenue 50.

### PROJECT DESCRIPTION

The subject project is proposing the construction of eleven (11) residential buildings including sixty-eight (68) multifamily (low-rise) units, two hundred and sixteen (216) multifamily (mid-rise) units (63 affordable units) and one (1) clubhouse with amenities. Access to the project site will be provided via two driveways along Washington Street and Avenue 50 respectively.

**Figure 1-1** shows the project site plan.

### STUDY AREA

The study area for this project was developed consistent with the County of Riverside Transportation Analysis Guidelines, including all intersections of “Collector” or higher classification streets with “Collector” or higher classification streets, at which the proposed project will add 50 or more peak hour trips. IEG prepared a project traffic study scoping agreement defining the study area, which was reviewed and approved by City of La Quinta staff prior to the preparation of this technical report. Refer to **Appendix A** for approved scoping agreement.

**Figure 1-2** presents the study area that includes the following key intersection locations:

1. Washington Street and Avenue 50
2. Washington Street and Eisenhower Drive
3. Washington Street and Avenue 48

Turning movement counts were conducted for one weekday during the morning and evening peak hours on Tuesday November 9, 2021. The turning movement counts are included in **Appendix B**. These counts will be utilized in Synchro 10 software to determine LOS at all study intersections. Existing Plus Ambient Growth without Project traffic volumes will be developed by adding a 2% annual growth for two years to the existing counts.

### PROJECT TRIP GENERATION

The trip generation is a measure or forecast of the number of trips that begin or end at the project site. These trips will result in some traffic increases on the streets where they occur. The rates used in this analysis were determined using *Trip Generation, 10<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE) that is the method preferred by the County of Riverside TA Guidelines. Project ITE average trip generation rates are presented in **Table 1-1**.

**Table 1-1  
Project Trip Generation Rate**

Land Use	Units <sup>1</sup>	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily Housing (Low Rise)	DU	220	0.11	0.35	0.46	0.35	0.21	0.56	7.32
Multifamily Housing (Mid Rise)	DU	221	0.09	0.27	0.36	0.27	0.17	0.44	5.44

Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10<sup>th</sup> Edition (2017)

<sup>1</sup> DU = Dwelling Unit

**Tables 1-2** summarizes the calculated trip generation based on the number of dwelling units associated with the proposed Project. As shown on Table 1-2, the proposed development is anticipated to generate approximately 1,618 total daily trips, 101 AM peak hour trips and 124 PM peak hour trips.

**Table 1-2  
Project Trip Generation**

Land Use	Intensity	Units <sup>1</sup>	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily Housing (Low Rise)	68	DU	7	24	31	24	14	38	498
Multifamily Housing (Mid Rise)	218	DU	20	58	78	59	37	96	1,186
<b>Total</b>			<b>27</b>	<b>82</b>	<b>109</b>	<b>83</b>	<b>51</b>	<b>134</b>	<b>1,684</b>

Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10<sup>th</sup> Edition (2017)

<sup>1</sup> DU = Dwelling Unit

**PROJECT TRIP DISTRIBUTION AND ASSIGNMENT**

Trip distribution and assignment is the process of identifying the probable destinations, directions and traffic routes that project related traffic will affect. Once the proposed development’s trips have been estimated, they are assigned to the study area network. For this development, the project trip distribution and assignment were developed, in coordination with City staff, based on the land use characteristics of the proposed project and surrounding area, existing travel patterns within the study area, anticipated travel patterns to and from the project site, and approved projects located in the vicinity of the project site.

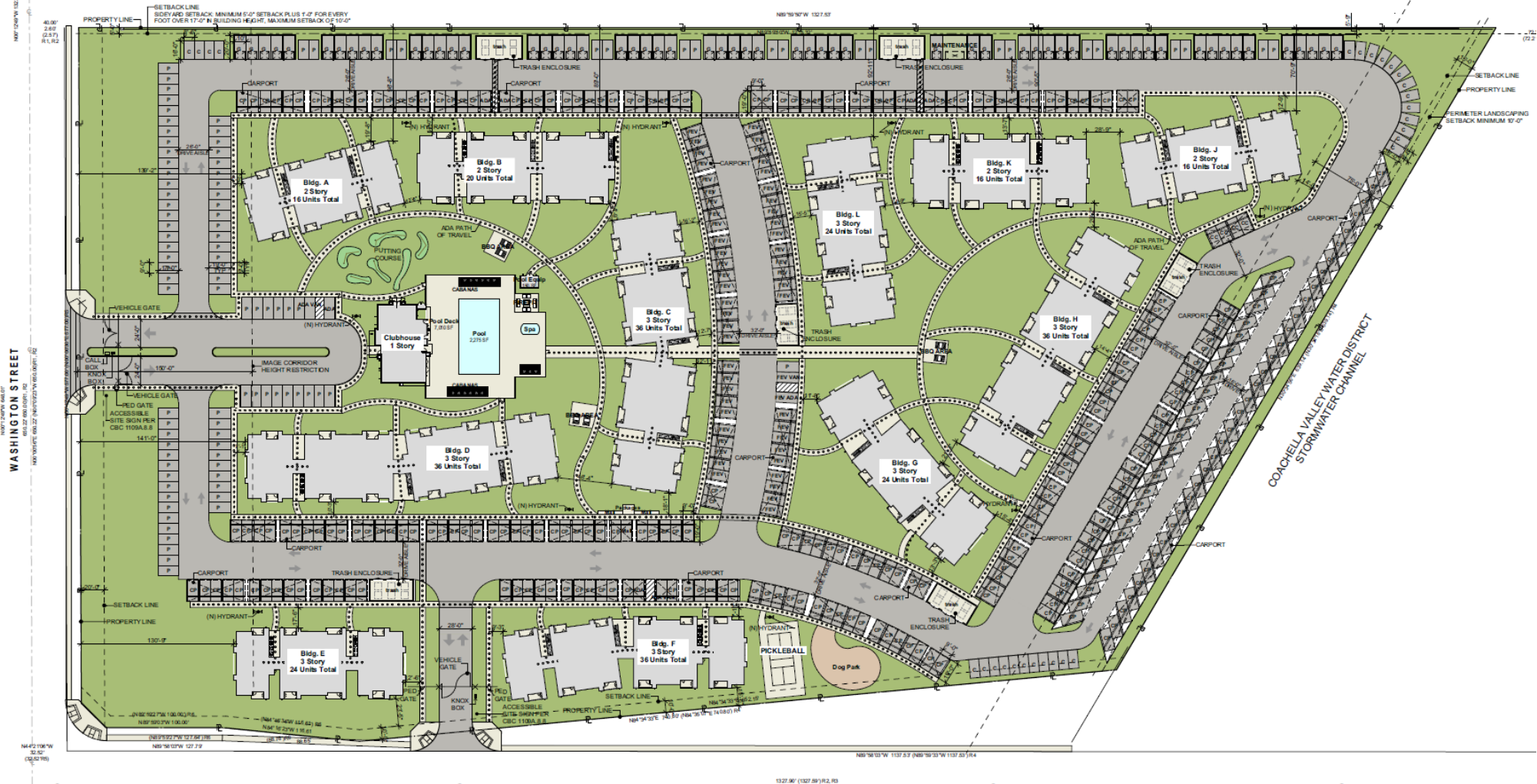
**Figures 1-1 through 1-4** show project site plan, study area, trip distribution/assignment and intersection turning movement volumes.

**PROJECT ACCESS**

Access to the project site will be provided via two driveways along Washington Street and Avenue 50, respectively.

**PARKING**

The proposed development will be required to provide on-site parking spaces consistent with City of La Quinta parking requirements.



AVENUE 50

Common Area Calculations	Area (SF)
1st Floor	
CLUBHOUSE RESIDENT ACTIVITY	978
FIRE PIT LANDSCAPE	322
GYM RESIDENT ACTIVITY	731
HALL CIRCULATION	188
HK SERVICE	36
Office ADMINISTRATION	200
Pool RETENTION BASIN	2,275
Pool Deck TERRACE	7,010
Pool Equip MECHANICAL	150
RR RESTROOMS	124
Shower RESTROOMS	68
Spa RETENTION BASIN	133
Stor SERVICE	111
Wet Bar RESIDENT ACTIVITY	36
WHTRU MECHANICAL	24
<b>TOTAL</b>	<b>12,474 sq ft</b>

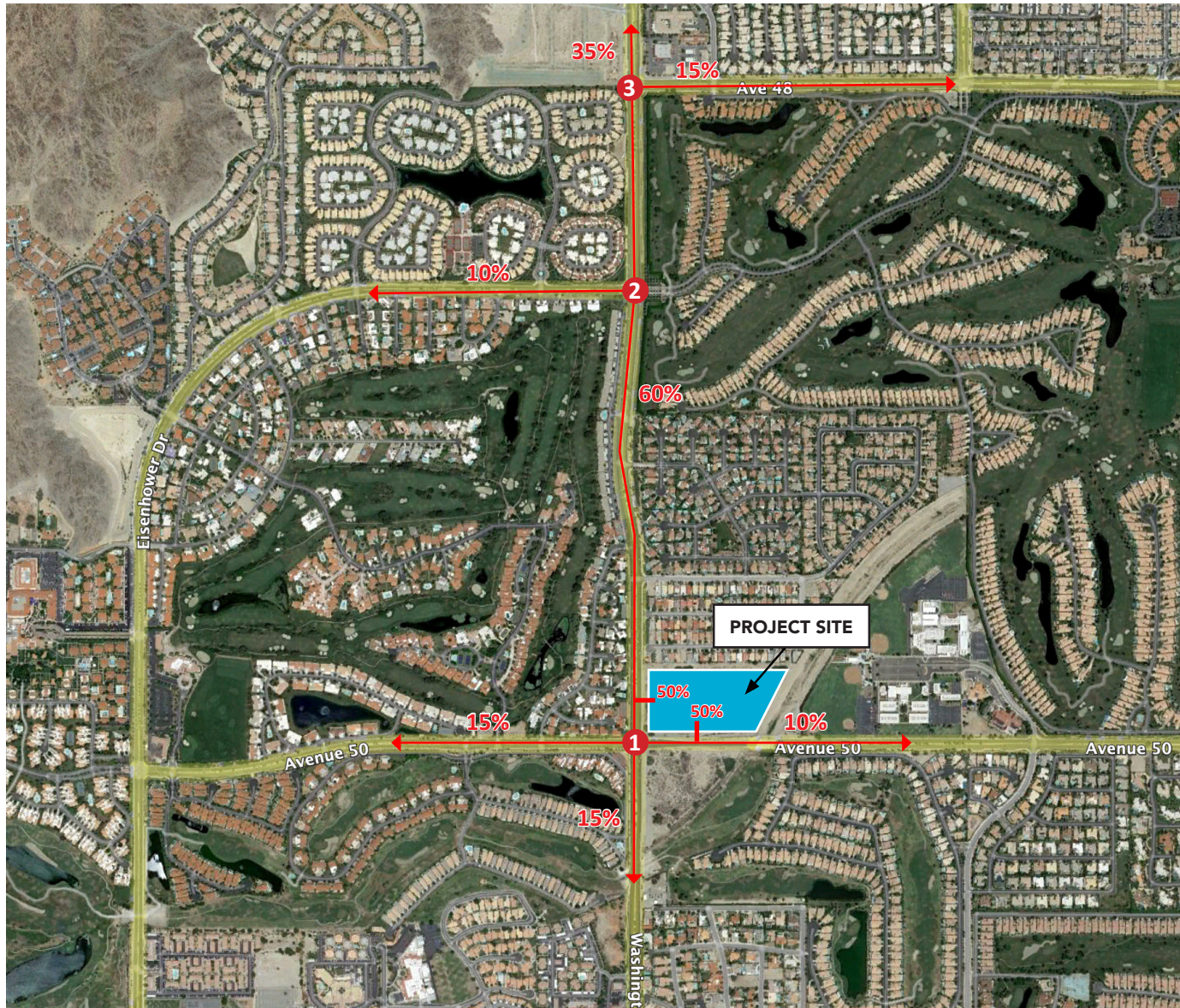
UNIT MIX	Unit Type	Unit Name	Units	Qty	Area (SF)	Total (SF)
1Bed Apartment	1B		1	118	755	87,500
1Bed Apartment	1A		1	70	873	47,110
3Bed Apartment	3A		2	98	956	49,888
			<b>38</b>	<b>284</b>		<b>228,378 sq ft</b>
MARKET RATE UNITS			231			
AFFORDABLE UNITS (28.0%)			83			
TOTAL UNITS			314			
PARKING/STORAGE			531			
PARKING PROVIDED			539			
TOTAL PAVED AREA			6,964 SF			
TOTAL BALCONY AREA			11,186 SF (N.I.C. STAIR LANDINGS)			

Parking Cakes	Qty
ADA	6
ADA VAN	2
C	28
CC	4
CP	265
FEV	52
FEV ADA	1
FEV VAN	1
G	58
M	1
P	101
<b>TOTAL</b>	<b>539</b>

DISABLED/ACCESSIBLE
ADA = ACCESSIBLE STANDING PARKING SPACE (8' X 12') 40' ASIDE
ADA VAN = ACCESSIBLE VAN PARKING SPACE (8' X 12') 40' ASIDE
C = CONTACT PARKING SPACE (8' X 12')
CC = CURBSIDE/CONTACT PARKING SPACE (8' X 12' X 12')
CP = CURBSIDE STANDING PARKING SPACE (8' X 12')
FEV = FUTURE EV PARKING SPACE (8' X 12')
FEV ADA = FUTURE EV ADA PARKING SPACE (8' X 12') 40' ASIDE
FEV VAN = FUTURE EV VAN PARKING SPACE (8' X 12') 40' ASIDE
G = GARAGE STANDING PARKING SPACE (10' X 20')
M = DESIGNATED MAIL VAN PARKING SPACE (8' X 12')
P = STANDARD PARKING SPACE (8' X 12') (8' X 12')





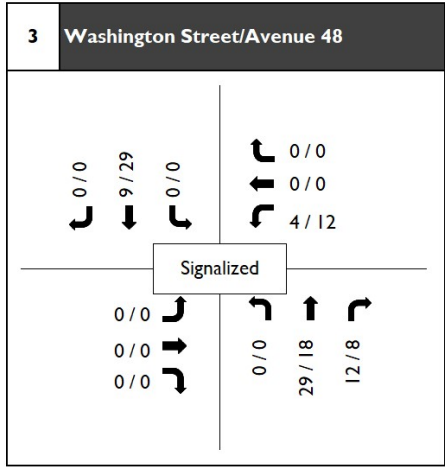
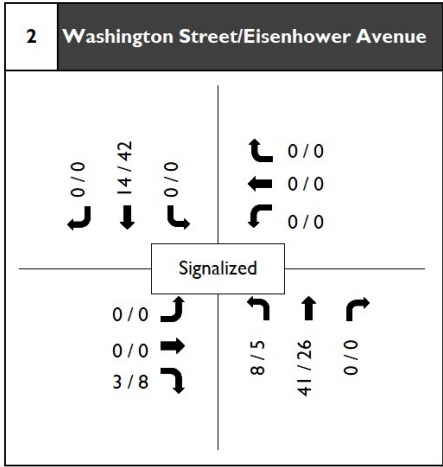
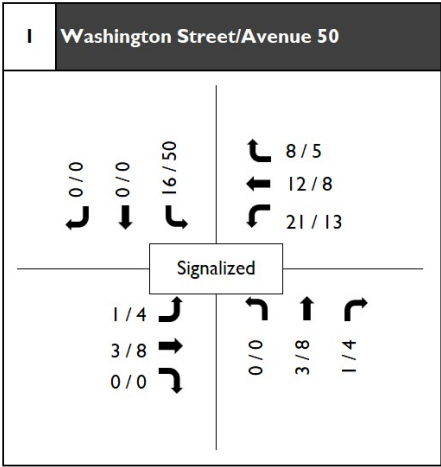


**LEGEND** # Intersection ●



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Troutdale Village  
Project Study Area and Trip Distribution  
Figure 1-2



**LEGEND**  
(AM/PM) Peak Hour Volumes

## 2.0 METHODOLOGIES

This section documents the methodologies and assumptions used to conduct the circulation impact analysis for the proposed project. This section contains the following background information:

- Study scenarios
- Study time periods
- Analysis methodologies

Refer to **Appendix A** for approved scoping agreement.

### STUDY SCENARIOS

This report presents an analysis of the intersections which were selected for the following anticipated timeframe scenarios:

- Existing Conditions (2021)
- Project Completion Year 2023 (Existing Plus Ambient Plus Project) Conditions
- Cumulative (Existing Plus Ambient Plus Cumulative Plus Project) Conditions

### STUDY TIME PERIODS

The City of La Quinta selected the following peak hours for analysis:

- Weekday AM (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM (peak hour between 4:00 PM and 6:00 PM)

### ANALYSIS METHODOLOGIES

Street system operating conditions are typically described in terms of “level of service.” Level of service is a report-card scale used to indicate the quality of traffic flow on roadway segments and at intersections. Level of service (LOS) ranges from LOS A (free flow, little congestion) to LOS F (forced flow, extreme congestion). **Table 2-1** describes generalized definitions of auto LOS A through F.



**Table 2-1  
Vehicular Level of Service Definitions**

LOS	Characteristics
A	Primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Controlled delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B	Reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
C	Stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E	Unstable operation and significant delay. Such operations may be due to some combination of adverse signal progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F	Flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed. Also, LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections have a volume-to-capacity ratio greater than 1.0.

Source: Highway Capacity Manual, Transportation Research Board (2010)

### Intersection Capacity Analysis

The analysis of peak hour intersection performance was conducted using the Synchro 10 software program, which uses methodologies defined in the Highway Capacity Manual (HCM) 6th Edition to calculate LOS. Level of service (LOS) for intersections is determined by control delay. Control delay is defined as the total elapsed time from when a vehicle stops at the end of a queue to the time the vehicle departs from the stop line. The total elapsed time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

### Signalized Intersections

The HCM analysis methodology for evaluating signalized intersections is based on the “operational analysis” procedure. This technique uses 1,900 passenger cars per hour of green per lane (pcphpl) as the maximum saturation flow of a single lane at an intersection. Average control delay is calculated by taking a volume-weighted average of all the delays for all vehicles entering the intersection. **Table 2-2** summarizes the level of service criteria for signalized intersections.



**Table 2-2  
Signalized Intersection Level of Service HCM Operational Analysis Method**

Average Control Delay Per Vehicle (seconds)	Level of Service (LOS) Characteristics
≤10.0	<i>LOS A</i> occurs when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
10.1 – 20.0	<i>LOS B</i> occurs when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with <i>LOS A</i> .
20.1 – 35.0	<i>LOS C</i> occurs when progression is favorable or the cycle length is moderate. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
35.1 – 55.0	<i>LOS D</i> occurs when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
55.1 – 80.0	<i>LOS E</i> occurs when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
>80.0	<i>LOS F</i> occurs when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, Transportation Research Board (2010)

**Table 2-3  
Level of Service Criteria for Stop Controlled Unsignalized Intersections**

Average Control Delay (sec/veh)	Level of Service (LOS)
≤10.0	A
10.1 – 15.0	B
15.1 – 25.0	C
25.1 – 35.0	D
35.1 – 50.0	E
>50.0	F

Source: Highway Capacity Manual, Transportation Research Board (2010)

**City of La Quinta General Plan Compliance**

In coordination with City staff, the transportation analysis will identify LOS deficiencies for compliance with City of La Quinta General Plan goals. The City of La Quinta has established LOS “D” as the minimum allowable level of service at signalized intersections and LOS “E” as the minimum allowable LOS for the side street at cross-street stop-controlled intersections. Therefore, any intersection operating at an LOS worse than these minimums will be considered deficient for the purposes of this analysis.

### 3.0 EXISTING CONDITIONS (2021) SCENARIO

This section documents the circulation system conditions within the study area of the project under Existing Conditions Year 2021. This section also documents operational deficiencies on the existing local and regional circulation networks.

#### ROADWAY NETWORK

Locally significant roadway located within the study area of the proposed project is discussed below.

Washington Street from Avenue 48 to Avenue 50 functions as a 6-lane major arterial. The posted speed limit on Washington Street is 50 miles per hour (mph). Per the City of La Quinta General Plan Circulation Element, the buildout roadway classification of Washington Street is a divided 6-lane major arterial.

Avenue 50 from Eisenhower Drive to Park Avenue mostly functions as a 3-lane primary arterial along the property frontage and transitions to a 4-lane primary arterial to the east. The posted speed limit on Washington Street is 45 mph. Per the City of La Quinta General Plan Circulation Element, the buildout roadway classification of Avenue 50 is a divided 4-lane primary arterial.

**Figures 3-1** and **3-2** show the City of La Quinta General Plan Circulation Network and Recommended Roadway Cross Sections, respectively.

#### TRANSIT SYSTEM

The SunLine Transit Agency (STA) is the main transit agency servicing the City of La Quinta. Currently, STA operates Route 7 within the vicinity of the project. Route 7 operates seven days a week and connects to Indian Wells and Palm Desert north of the site. Weekday and weekend service frequency is 90 minutes. Bus stops for Route 7 are currently located at the northeast corner of the intersection of Washington Street and Avenue 50 for northbound service and at the southwest corner for southbound service. Pedestrian accessibility and connectivity from the project site to these bus stops is provided along the east and west sides of Washington Street with signalized crossings at the intersection where the bus stops are located. Bus route information is included in **Appendix G**.

#### ACTIVE TRANSPORTATION SYSTEM

Active transportation facilities including pedestrian and bicycle facilities are provided within the study area of the project. Pedestrian crosswalks are generally provided at signalized intersections along Washington Street with sidewalks on the east side. Buffered Class II bike lanes are provided in both directions along Washington Street and along the southside along Avenue 50, east of the project site.

#### TRAFFIC VOLUMES

The Existing Year 2021 peak hour intersection turning movement volumes were counted on Tuesday November 9, 2021. The turning movement counts are provided in **Appendix B**.

## ANALYSIS RESULTS

**Table 3-1** shows Existing Conditions intersection operation analysis results.

**Figure 3-3** shows intersection turning movement counts under Existing Year 2021 scenario.

**Table 3-1**  
**Existing Conditions 2021 Scenario Intersection Operation Analysis**

Intersection	Intersection Control	Existing Conditions	
		Delay (a)	LOS (b)
AM/PM Peak			
1. Washington Street and Avenue 50	Signalized	20.7/16.4	C/B
2. Washington Street and Eisenhower Drive	Signalized	15.0/13.7	B/B
3. Washington Street and Avenue 48	Signalized	13.2/11.9	B/B

Notes:

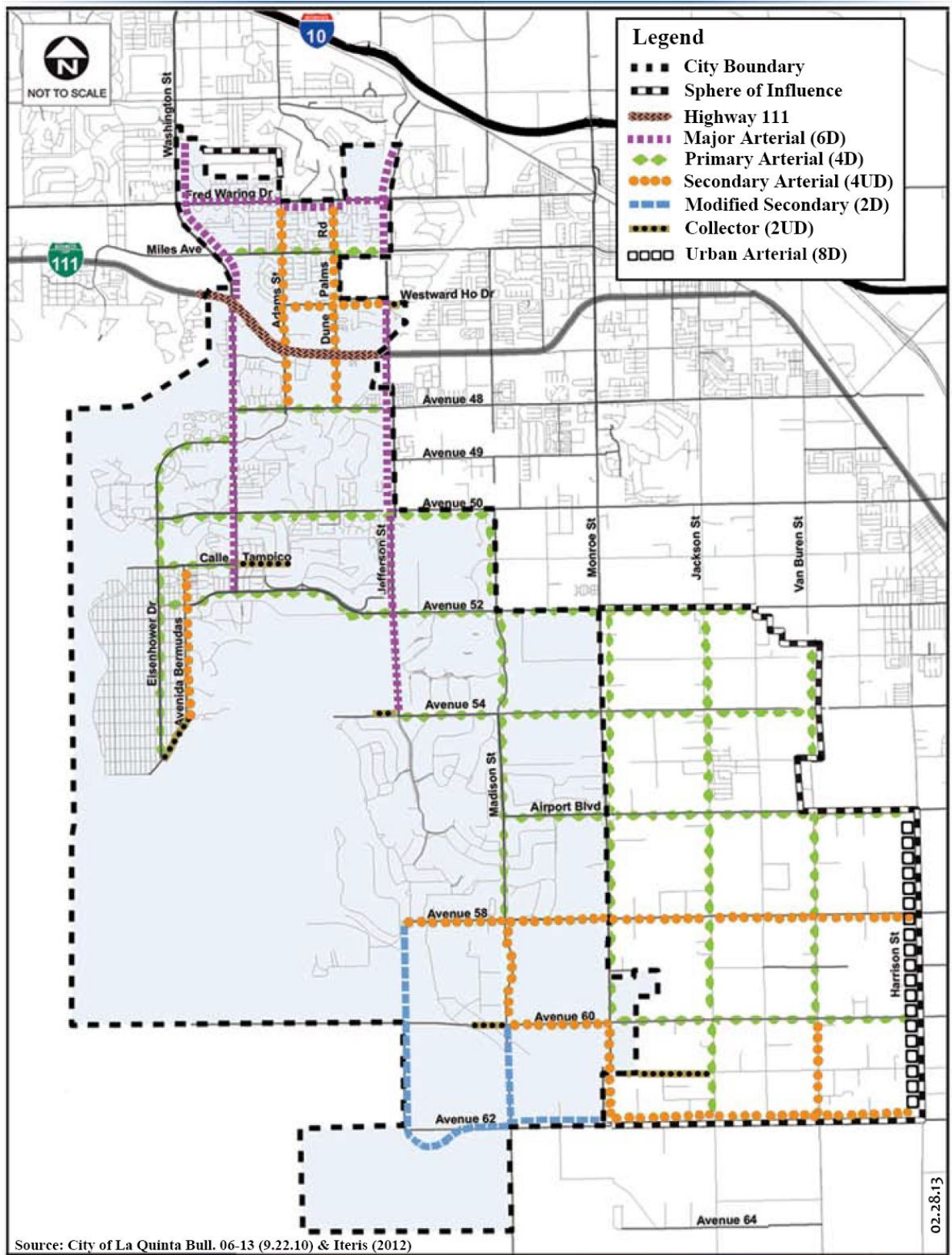
(a) Delay refers to the average control delay for the entire intersection, measured in seconds/vehicle.

(b) LOS calculations are based on the methodology outlined in the Highway Capacity Manual 6<sup>th</sup> Edition and performed using Synchro 10

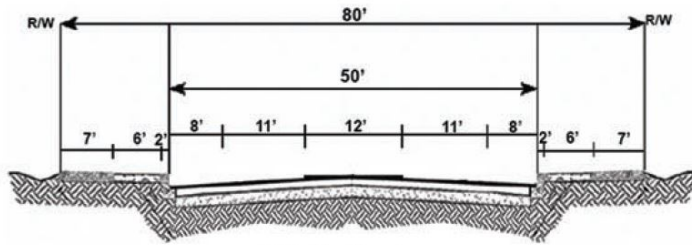
Per the analysis results shown in **Table 3-1**, all analyzed intersections are operating at an acceptable LOS under Existing Year 2021 Conditions. Therefore, no improvements are required.

Existing Conditions peak hour analysis worksheets are provided in **Appendix C**.

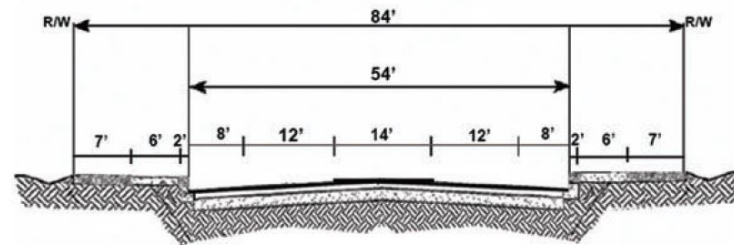




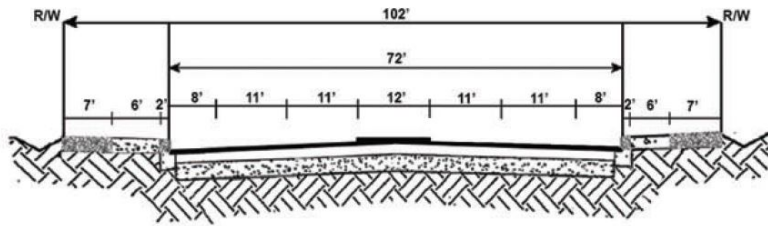




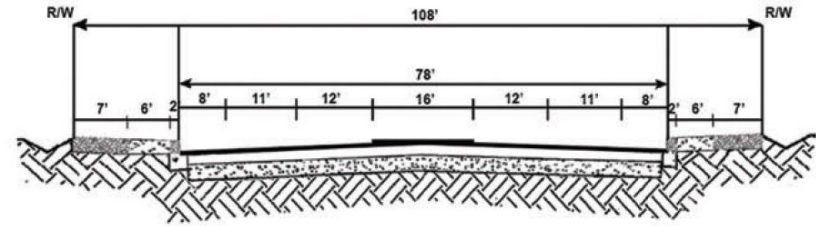
**80' Collector**



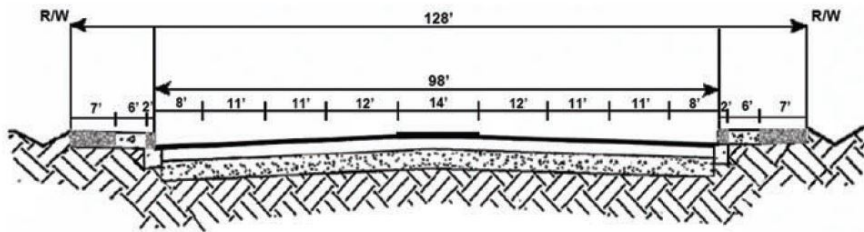
**84' Modified Secondary Arterial**



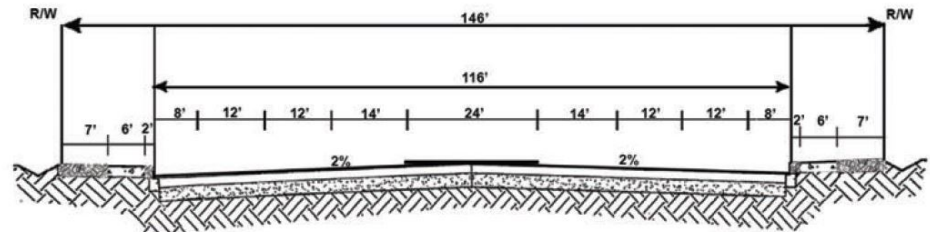
**102' Secondary Arterial**



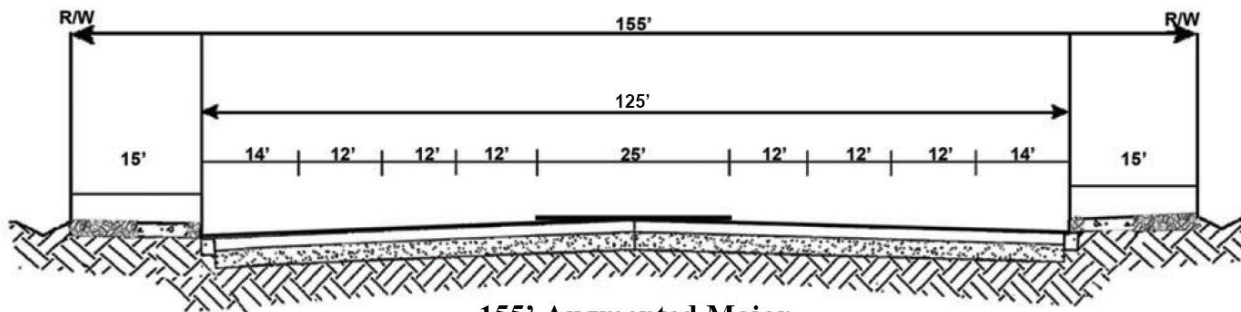
**108' Primary Arterial**



**128' Major Arterial**

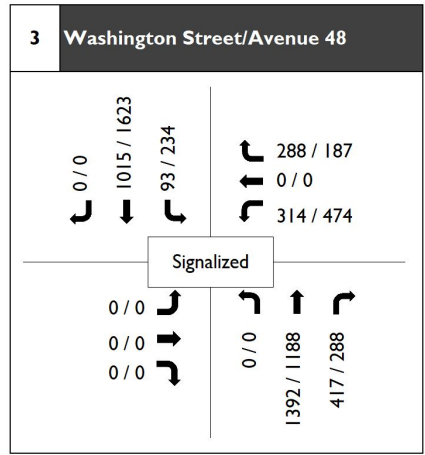
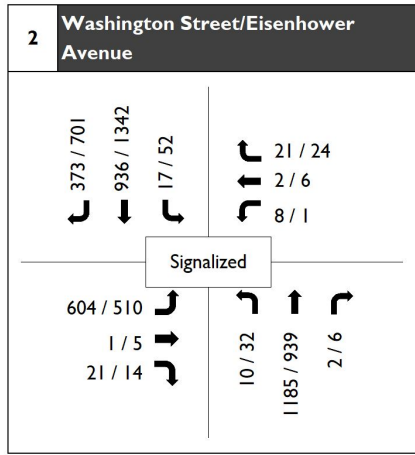
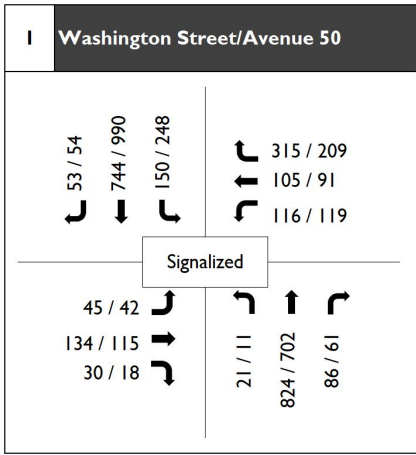


**146' State Highway 111**



**155' Augmented Major**





**LEGEND**

(AM/PM) Peak Hour Volumes



## 4.0 PROJECT COMPLETION CONDITIONS

This section documents the circulation system conditions within the study area of the project under Project Completion (Existing Plus Ambient Plus Project) Conditions. Since the project is expected to be built and operational in 2023, a 2% annual growth factor for two years was applied to the existing counts. Project traffic volumes are then added to these volumes to develop Project Completion Conditions traffic volumes. This section also documents potential operational deficiencies on the existing local and regional circulation networks.

### ANALYSIS RESULTS

Table 4-1 shows Project Completion Conditions intersection operation analysis results.

Figures 4-1 shows intersection turning movement volumes under Project Completion Conditions.

**Table 4-1**  
**Project Completion Scenario Intersection Operation Analysis**

Intersection	Existing Conditions		Project Completion Conditions	
	Delay (a)	LOS (b)	Delay (a)	LOS (b)
<b>AM Peak/PM Peak</b>				
1. Washington Street and Avenue 50	20.7/16.4	C/B	22.2/17.4	C/B
2. Washington Street and Eisenhower Drive	15.0/13.7	B/B	16.3/14.7	B/B
3. Washington Street and Avenue 48	13.2/11.9	B/B	14.6/12.7	B/B

Notes:

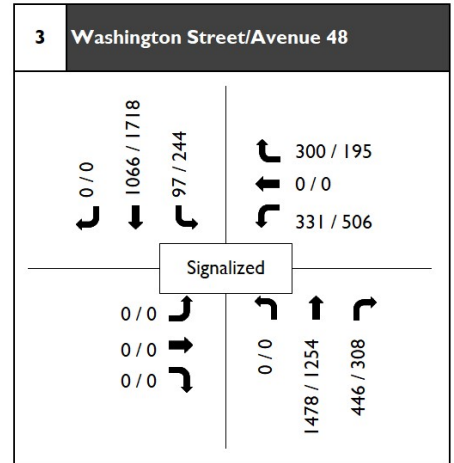
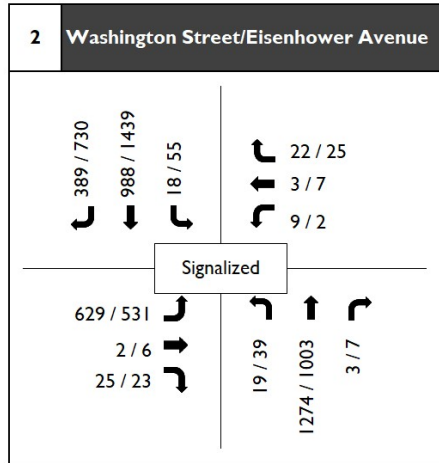
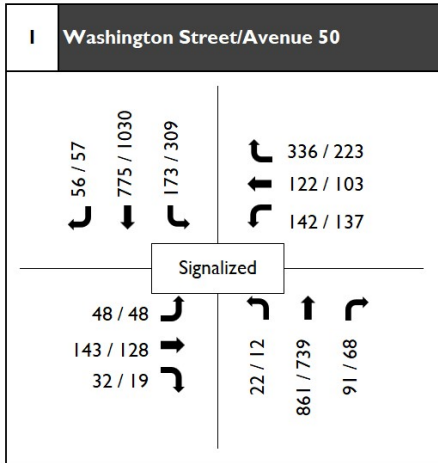
(a) Delay refers to the average control delay for the entire intersection, measured in seconds/vehicle. At unsignalized intersections, delay refers to the worst movement.

(b) LOS calculations are based on the methodology outlined in the Highway Capacity Manual 6<sup>th</sup> Edition and performed using Synchro 10

Per the analysis results shown in **Table 4-1**, all analyzed intersections are operating at an acceptable LOS under Project Completion Conditions. Therefore, no additional improvements are required.

Project Completion Conditions peak hour analysis worksheets are provided in **Appendix D**.





**LEGEND**

(AM/PM) Peak Hour Volumes

## 5.0 CUMULATIVE CONDITIONS

This section documents the circulation system conditions within the study area of the Project under Cumulative (Existing Plus Ambient Plus Cumulative Plus Project) Conditions. The Cumulative Conditions traffic volumes were developed by adding cumulative project trips to the Project Completion Conditions traffic volumes. This cumulative project is shown in **Table 5-1** below. The location is shown in **Figure 5-1** and the Cumulative project trip volumes assigned to the study intersections are shown in **Figure 5-2**. This section also documents potential Cumulative Project operational deficiencies on the circulation network. No network improvements are assumed under Cumulative conditions.

**Table 5-1**  
**Cumulative Projects**

Project	Land Use	Quantity	Units <sup>1</sup>
Crossing at La Quinta	Residential	68	DU

<sup>1</sup>DU = Dwelling Units

### ANALYSIS RESULTS

**Table 5-2** shows Cumulative Conditions intersection operation analysis results.

**Figures 5-1** and **5-2** show intersection turning movement volumes for the cumulative projects in **Table 5-1** and under Cumulative Conditions, respectively. Trip distribution for each Cumulative project is included in **Appendix E**.

**Table 5-2**  
**Cumulative Condition Intersection Operation Analysis**

Intersection	Existing Conditions		Cumulative Conditions	
	Delay (a)	LOS (b)	Delay (a)	LOS (b)
1. Washington Street and Avenue 50	20.7/16.4	C/B	22.4/17.7	C/B
2. Washington Street and Eisenhower Drive	15.0/13.7	B/B	16.4/14.8	B/B
3. Washington Street and Avenue 48	13.2/11.9	B/B	14.8/12.8	B/B

Notes:

(a) Delay refers to the average control delay for the entire intersection, measured in seconds/vehicle. At unsignalized intersection, delay refers to the worst movement.

(b) LOS calculations are based on the methodology outlined in the Highway Capacity Manual 6<sup>th</sup> Edition and performed using Synchro 10

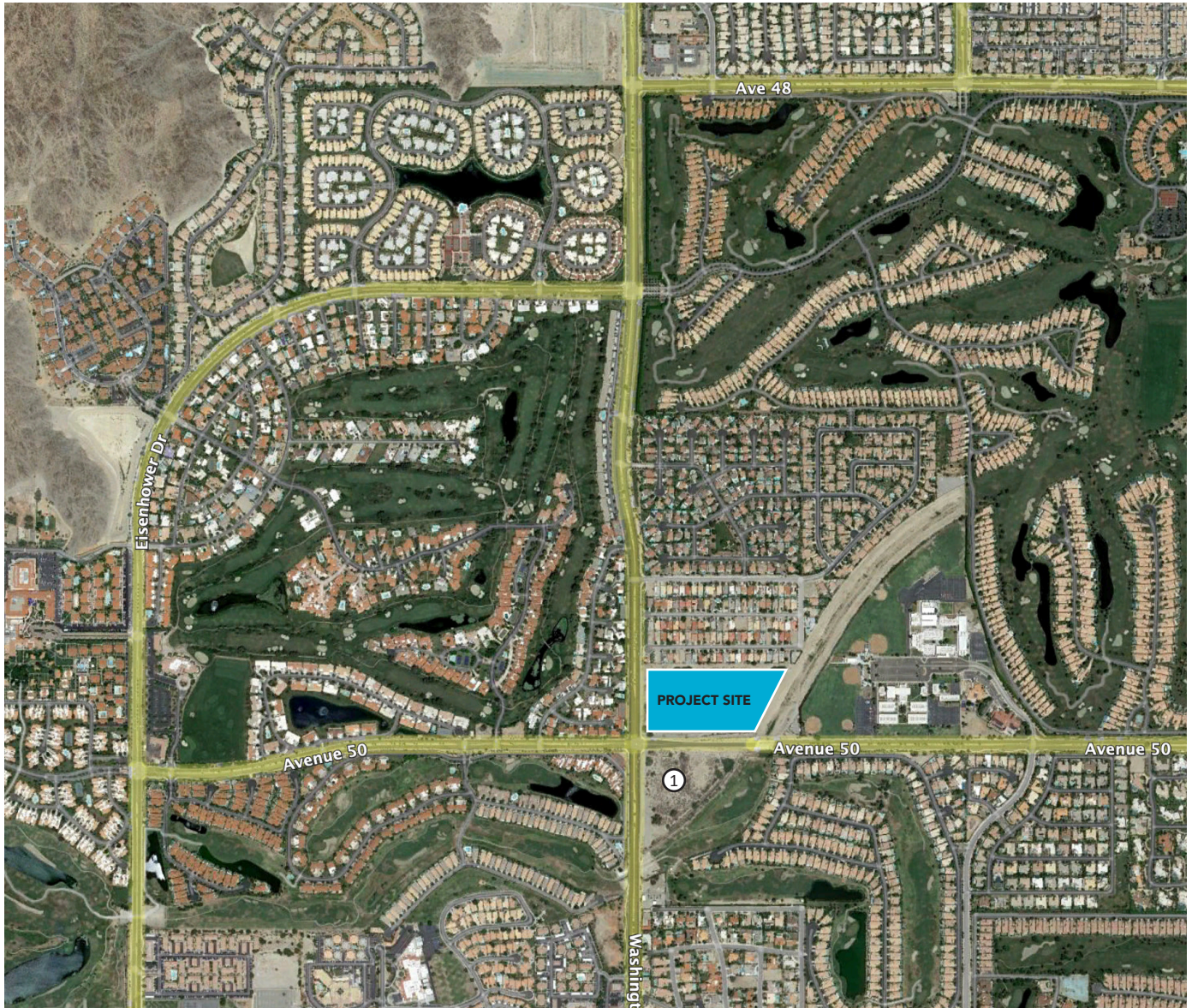
Per the analysis results shown in **Table 5-2**, all analyzed intersections are operating at an acceptable LOS under Cumulative Conditions. Therefore, no additional improvements are required.

Cumulative Condition peak hour analysis worksheets are provided in **Appendix F**.

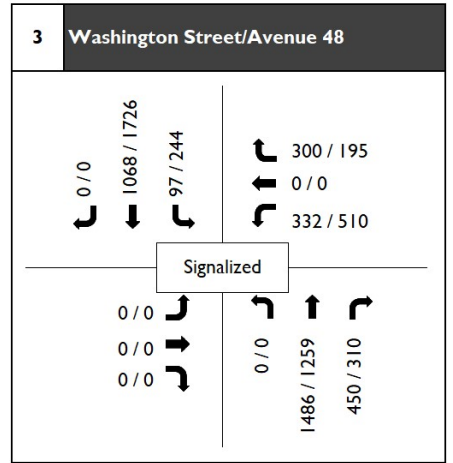
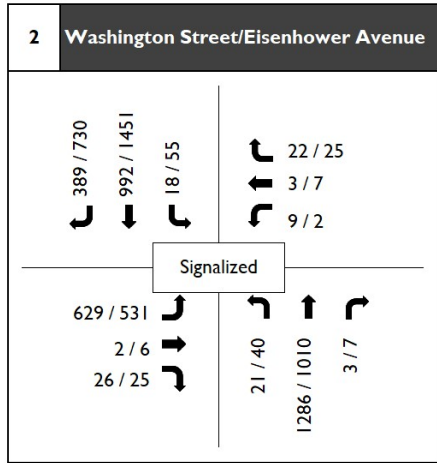
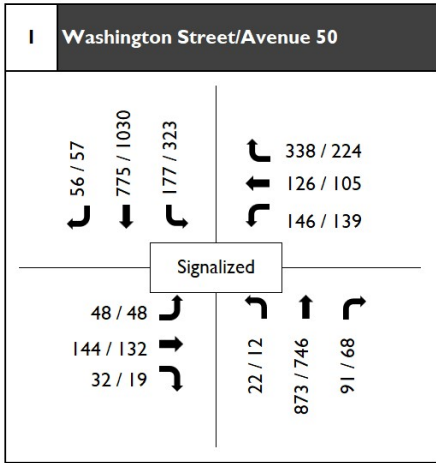
1 Washington Street/Avenue 50	
 0/0 0/0 4/14 2/1 4/2 4/2	 2/1 4/2 4/2
Signalized	
 0/0 1/4 0/0	 0/0 12/7 0/0

2 Washington Street/Eisenhower Avenue	
 0/0 4/12 0/0	 0/0 0/0 0/0
Signalized	
 0/0 0/0 1/2	 2/1 12/7 0/0

3 Washington Street/Avenue 48	
 0/0 2/8 0/0	 0/0 0/0 1/4
Signalized	
 0/0 0/0 0/0	 0/0 8/5 4/2



① Crossing at La Quinta



**LEGEND**

(AM/PM) Peak Hour Volumes



## 6.0 VEHICLE MILES TRAVELED

This section documents the results of the Project Screening assessment per the City of La Quinta Vehicle Miles Traveled (VMT) Analysis Policy (June 2021).

The VMT Policy provides project screening criteria to determine if a VMT analysis is necessary. A presumption can be made that a project would not have a significant transportation related CEQA impact if a project meets one of project-level assessment screening criteria identified in the City's VMT Analysis Policy.

Per the City of La Quinta VMT Analysis Policy and screening criteria for Development Projects, the proposed project consisting of a combination of 68 multifamily (low-rise) units and 216 multifamily (mid-rise) of which 63 units are affordable housing units can be presumed to not have a significant transportation related CEQA impact by qualifying for small and local serving projects screening criteria as affordable housing, multi-family (low-rise) housing projects less than or equal to 200 dwelling units; or multi-family (mid-rise) housing projects less than or equal to 245 dwelling units.



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**APPENDIX A -**  
**SCOPING AGREEMENT**





Date: October 26, 2021

To: Bryan McKinney, Public Works/Engineering Director, City Engineer, City of La Quinta

From: George Ghossain, Principal Engineer, Integrated Engineering Group

**Subject: TRIP GENERATION AND VMT SCOPING AGREEMENT FOR WASHINGTON STREET AND AVENUE 50 MULTI-FAMILY DEVELOPMENT, LA QUINTA**

---

Integrated Engineering Group (IEG) is pleased to submit this scoping agreement for the Washington Street and Avenue 50 Multi-Family Development located on the northeast corner of Washington Street and Avenue 50 in the City of La Quinta, California. The subject project is proposing the construction of 10 residential buildings including 221 multifamily (low-rise) units and 1 clubhouse with amenities on a vacant site.

Our goal is to obtain comments from City of La Quinta staff, to ensure that this memo fully addresses the analysis requirements per the City of La Quinta General Plan and County of Riverside Transportation Analysis (TA) Guidelines for Level of Service (LOS) and Vehicle Miles Traveled (VMT), December 2020.

The preliminary site plan for the proposed Project is shown on **Figure 1**. It is anticipated that the proposed development will be built in one phase which will be discussed in detail with City staff. Access to the Project site will be provided via one full access driveway along Avenue 50 and one right in/right out only driveway along Washington Street.

### **STUDY AREA**

The study area for this project was developed consistent with the County of Riverside TA guidelines in coordination with City staff. **Figure 2** presents the study area that includes the following three key intersections:

#### **Intersections**

1. Washington Street and Avenue 50
2. Washington Street and Eisenhower Drive/Rancho La Quinta Drive
3. Washington Street and Avenue 48

### **ANALYSIS SCENARIOS**

Analysis of the intersection operating conditions during the peak periods will be conducted for the following anticipated timeframe scenarios:

- Existing Year 2021
- Project Completion (Existing plus Ambient Growth plus Project)



- Cumulative (Existing plus Ambient Growth plus Project plus Cumulative Projects)

**TRIP GENERATION**

Trip generation is a measure or forecast of the number of trips that begin or end at the project site. The traffic generated is a function of the extent and type of development proposed for the site. These trips will result in some traffic increases on the streets where they occur. Per Appendix B in the County of Riverside TA Guidelines, trip generation rates from the *Trip Generation Manual, 10<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE) should be used to determine trip generation.

The proposed Project trip generation rates and trip calculations summary are presented in **Tables 1** and **2**, respectively.

**Table 1**  
**Project Trip Generation Rate**

Land Use <sup>1</sup>	Units <sup>2</sup>	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily Housing (Low Rise)	DU	220	0.11	0.35	0.46	0.35	0.21	0.56	7.32

<sup>1</sup>Trip Generation Rate Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

<sup>2</sup>DU = Dwelling Unit

**Table 2**  
**Project Trip Generation**

Land Use	Intensity	Units <sup>1</sup>	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily Housing (Low Rise)	221	DU	23	78	101	78	46	124	1,618
<b>Total</b>			<b>23</b>	<b>78</b>	<b>101</b>	<b>78</b>	<b>46</b>	<b>124</b>	<b>1,618</b>

<sup>1</sup>DU = Dwelling Unit

**Table 2** summarizes the trip generation based on the dwelling units associated with the proposed Project. As shown, the proposed project is estimated to generate approximately 1,618 total daily trips, 101 AM peak hour trips and 124 PM peak hour trips.

**TRIP DISTRIBUTION/ASSIGNMENT**

Trip distribution and assignment is the process of identifying the probable destinations, directions and traffic routes that project related traffic will likely affect. Trip distribution and assignment information can be estimated from observed traffic patterns, experience or through use of the Riverside County Transportation Analysis Model (RivCOM). Once the proposed development trips have been estimated, they are assigned to the study area network. For this development, the project distribution was developed based on the land use characteristics of the proposed project and surrounding area, anticipated travel patterns to and from the project site and existing travel patterns within the study area. **Figures 2** and **3** show project trips distribution percentages and assignment.



**EXISTING AND PROJECTED TRAFFIC VOLUMES**

Intersection turning movement and roadway segment average daily traffic counts will be conducted during the weekday morning peak period from 7:00 AM to 9:00 AM and weekday evening peak period from 4:00 PM to 6:00 PM. Opening Year 2023 volumes will be developed by applying two percent per year growth factor over the Existing Year 2021 volumes.

**IMPROVEMENT TO ADDRESS LOS DEFICIENCIES**

For the purposes of this analysis, LOS D is the minimum LOS standard for intersection analysis is LOS D and improvements should be identified to address intersection deficiencies caused by the project.

**VEHICLE MILES TRAVELED (VMT)**

The City of La Quinta does provide guidance on evaluating VMT for transportation impacts under CEQA. IEG will conduct a VMT assessment per City’s revised VMT Guidelines dated June 2021 and submit for City staff review and approval.

Sincerely,  
 IEG

George Ghossain, PE, MSCE, MPA  
 Principal Engineer

Approved By:

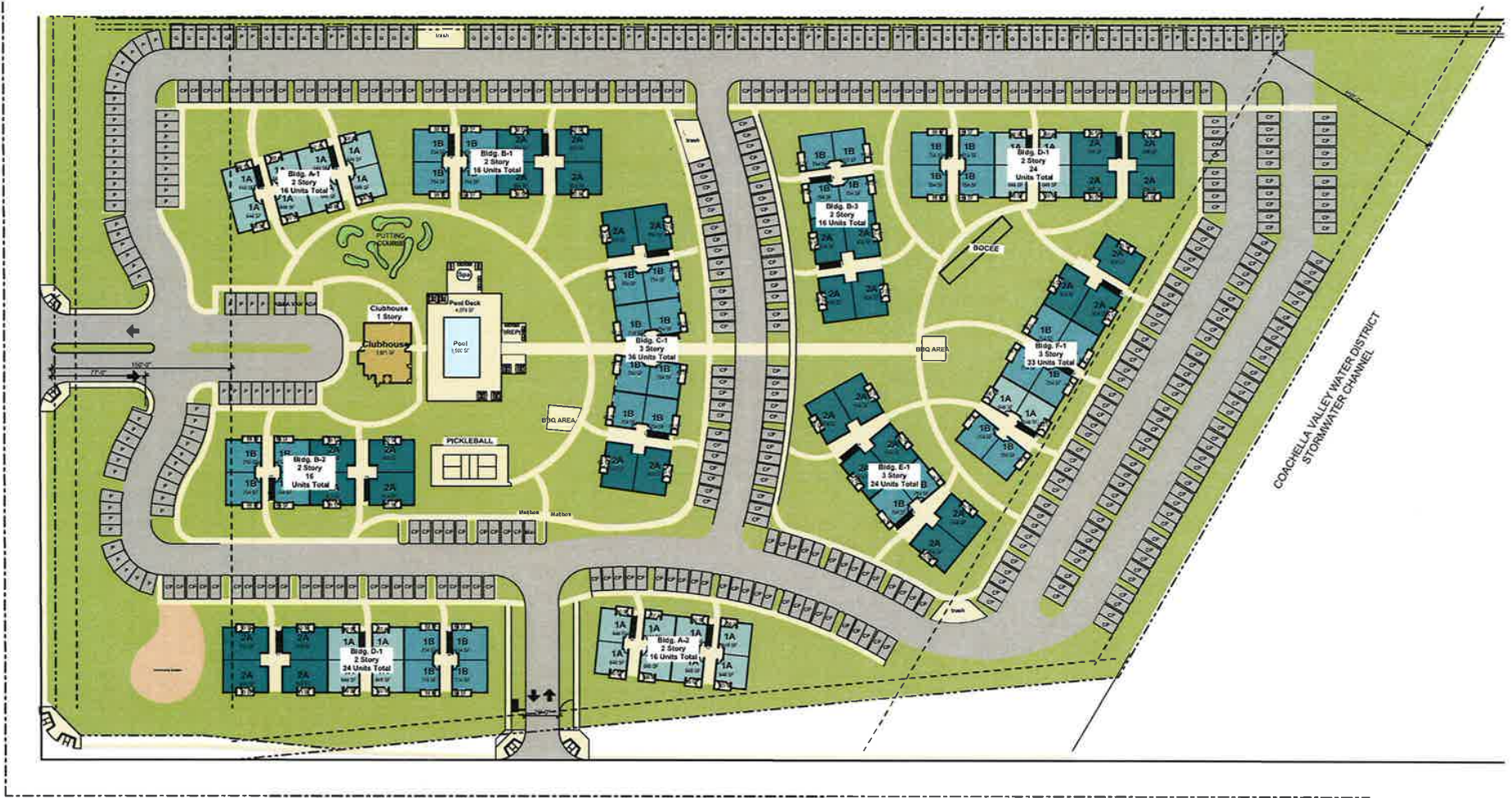
Signature:

Name: \_\_\_\_\_

Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- Attachments: Figure 1 – Project Site Plan  
 Figure 2 – Study Area Trip Distribution  
 Figure 3 – Trip Assignment

WASHINGTON STREET



AVENUE 50

CONCHELLA VALLEY WATER DISTRICT  
STORMWATER CHANNEL

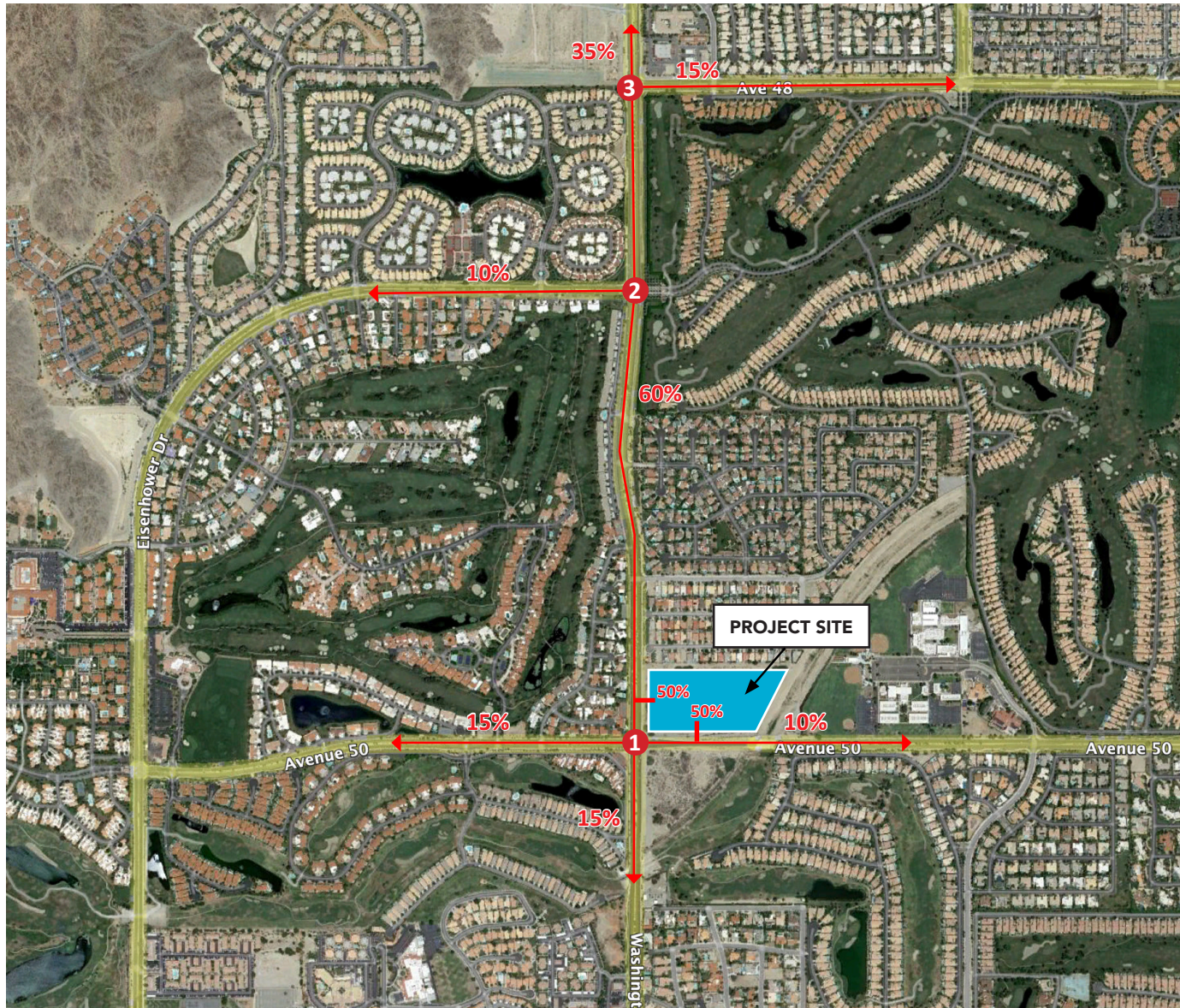


**INTEGRATED ENGINEERING GROUP**  
TRANSPORTATION PLANNING AND ENGINEERING

Washington Street & Avenue 50 Multi-Family Development

Project Site Plan

Figure 1

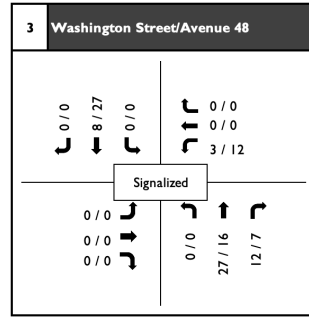
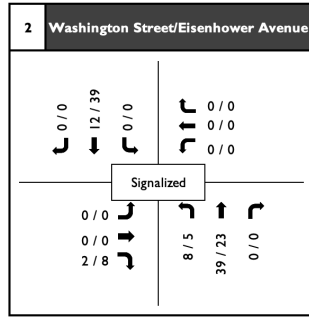
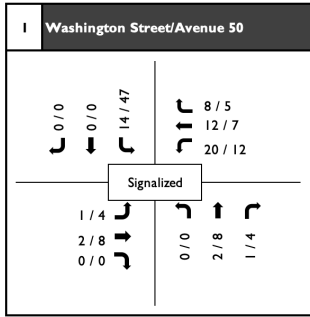


**LEGEND** # Intersection ●



**INTEGRATED ENGINEERING GROUP**  
TRANSPORTATION PLANNING AND ENGINEERING

Washington Street & Avenue 50 Multi-Family Development  
Project Study Area and Trip Distribution  
Figure 2



**LEGEND**

(AM/PM) Peak Hour Volumes

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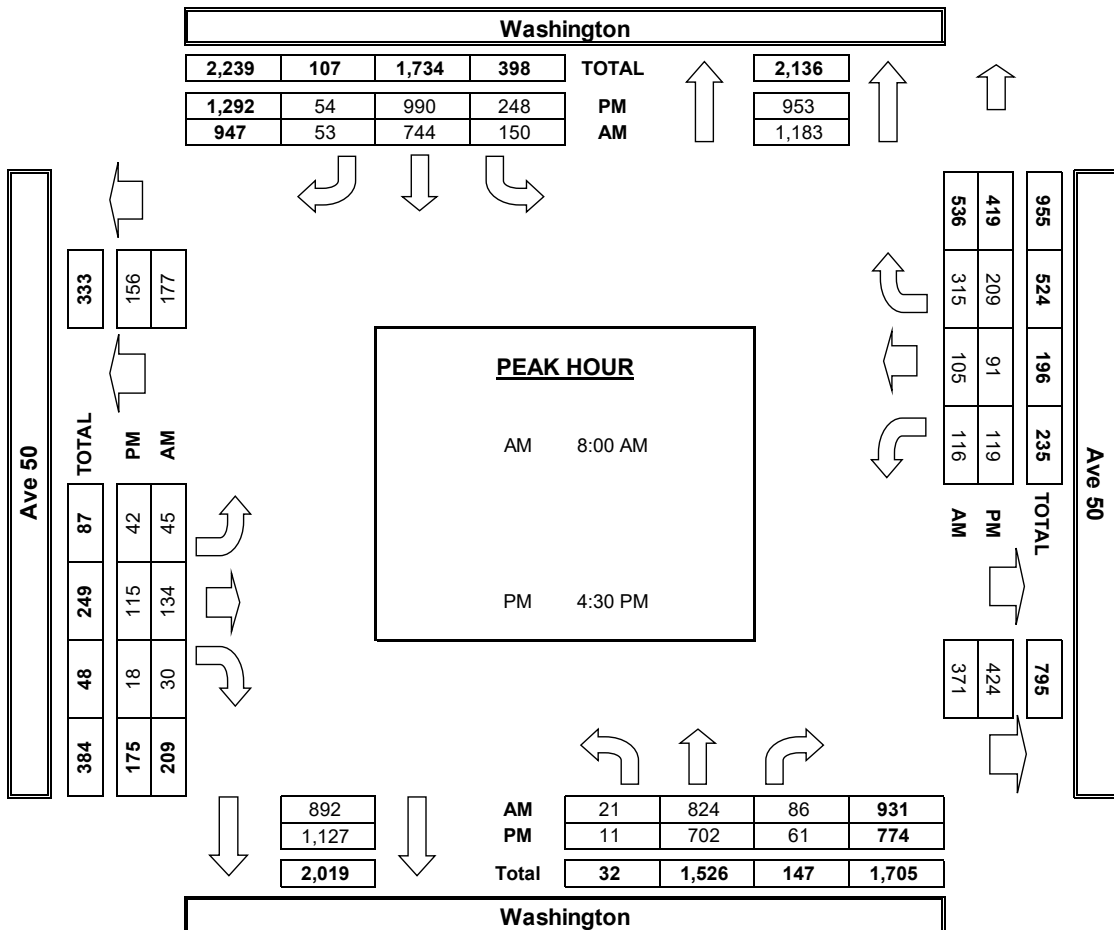
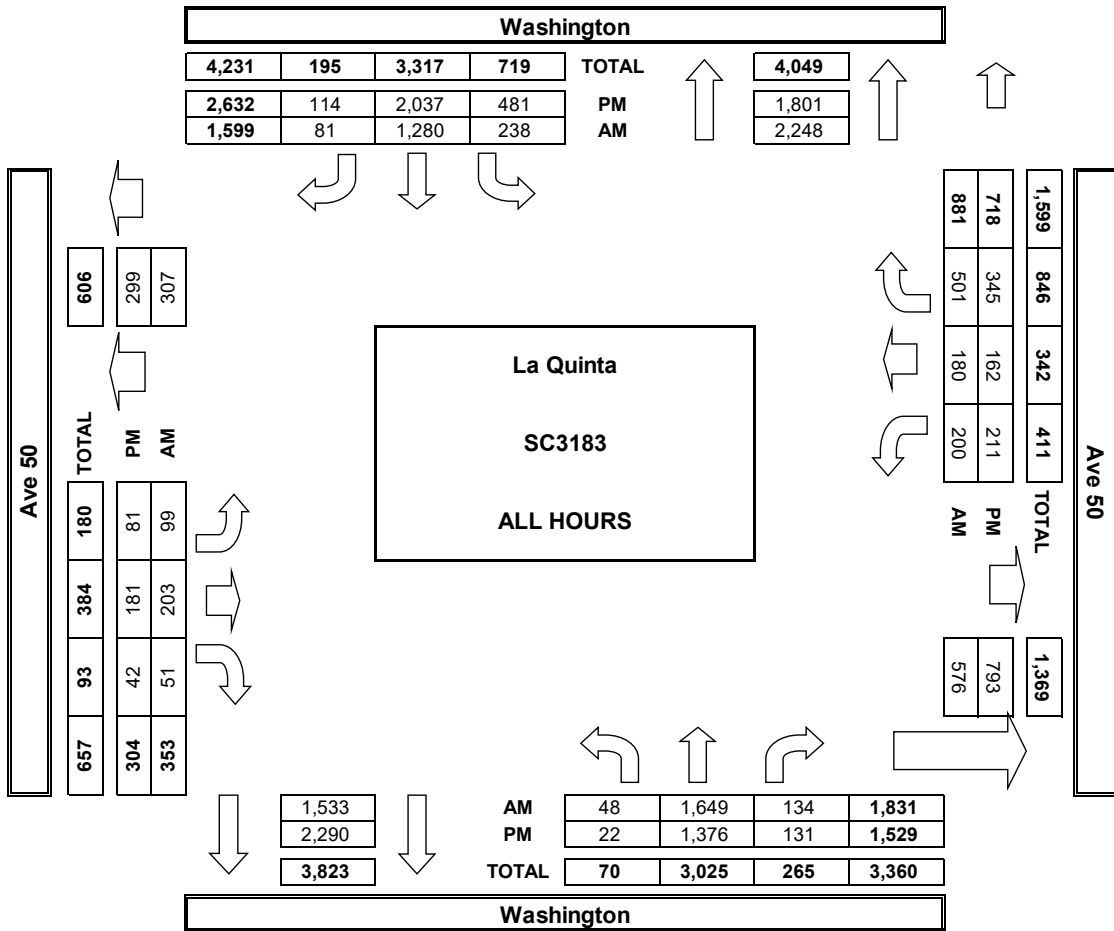
**APPENDIX B -  
TRAFFIC COUNT DATA**







**AimTD LLC**  
TURNING MOVEMENT COUNTS



### INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

**DATE:**  
Tue, Nov 9, 21

**LOCATION:**  
NORTH & SOUTH:  
EAST & WEST:

La Quinta  
Washington  
Eisenhower

**PROJECT #:** SC3183  
**LOCATION #:** 2  
**CONTROL:** SIGNAL

**NOTES:**

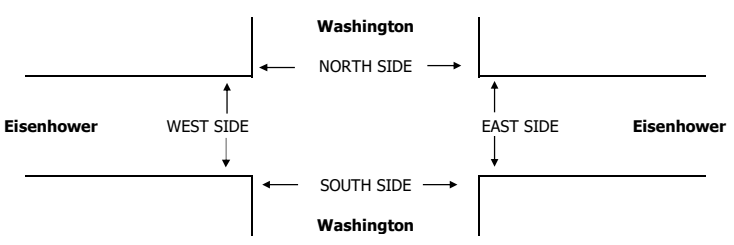
AM  
PM  
MD  
OTHER  
OTHER

← W
E →

▲ N
▼ S

Add U-Turns to Left Turns

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL	U-TURNS					
	Washington			Washington			Eisenhower - Rancho La Quinta			Eisenhower - Rancho La Quinta				NB	SB	EB	WB	TTL	
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR							
7:00 AM	1	171	0	2	132	59	143	0	2	0	1	7	518	0	0	0	0	0	
7:15 AM	1	309	0	3	154	71	173	0	6	0	1	3	721	0	0	0	0	0	
7:30 AM	4	311	1	2	152	86	189	0	5	0	3	8	761	0	0	0	0	0	
7:45 AM	2	289	2	7	219	96	154	1	2	3	0	1	776	0	0	0	0	0	
8:00 AM	3	249	0	4	205	84	155	0	4	2	0	4	710	0	2	0	0	2	
8:15 AM	2	309	2	5	215	83	153	0	6	2	0	2	779	0	1	0	0	1	
8:30 AM	4	245	0	6	257	101	140	0	6	2	1	9	771	1	0	1	0	2	
8:45 AM	1	382	0	2	259	105	156	1	5	2	1	6	920	0	0	0	0	0	
<b>VOLUMES</b>	18	2,265	5	31	1,593	685	1,263	2	36	11	7	40	5,956	1	3	1	0	5	
<b>APPROACH %</b>	1%	99%	0%	1%	69%	30%	97%	0%	3%	19%	12%	69%							
<b>APP/DEPART</b>	2,288	/	3,570	2,309	/	1,641	1,301	/	35	58	/	710	0						
<b>BEGIN PEAK HR</b>	8:00 AM																		
<b>VOLUMES</b>	10	1,185	2	17	936	373	604	1	21	8	2	21	3,180						
<b>APPROACH %</b>	1%	99%	0%	1%	71%	28%	96%	0%	3%	26%	6%	68%							
<b>PEAK HR FACTOR</b>	0.781			0.906			0.966			0.646			0.864						
<b>APP/DEPART</b>	1,197	/	1,812	1,326	/	966	626	/	17	31	/	385	0						
4:00 PM	3	201	0	11	359	176	112	0	3	0	1	6	872	0	0	0	0	0	
4:15 PM	6	259	1	10	345	189	110	0	2	1	2	5	930	0	2	0	0	2	
4:30 PM	9	222	1	18	324	182	139	2	2	0	1	5	905	1	0	0	0	1	
4:45 PM	11	209	3	15	329	149	118	3	6	0	1	9	853	0	1	0	0	1	
5:00 PM	6	249	1	9	344	181	143	0	4	0	2	5	944	0	2	0	0	2	
5:15 PM	2	237	1	7	338	164	141	0	1	3	2	10	906	0	0	0	0	0	
5:30 PM	2	185	0	11	389	157	121	2	2	6	1	4	880	0	1	0	0	1	
5:45 PM	3	199	2	5	311	147	84	0	2	3	1	1	758	0	1	0	0	1	
<b>VOLUMES</b>	42	1,761	9	86	2,739	1,345	968	7	22	13	11	45	7,048	1	7	0	0	8	
<b>APPROACH %</b>	2%	97%	0%	2%	66%	32%	97%	1%	2%	19%	16%	65%							
<b>APP/DEPART</b>	1,812	/	2,781	4,170	/	2,775	997	/	95	69	/	1,397	0						
<b>BEGIN PEAK HR</b>	4:15 PM																		
<b>VOLUMES</b>	32	939	6	52	1,342	701	510	5	14	1	6	24	3,632						
<b>APPROACH %</b>	3%	96%	1%	2%	64%	33%	96%	1%	3%	3%	19%	77%							
<b>PEAK HR FACTOR</b>	0.918			0.963			0.900			0.775			0.962						
<b>APP/DEPART</b>	977	/	1,478	2,095	/	1,358	529	/	58	31	/	738	0						



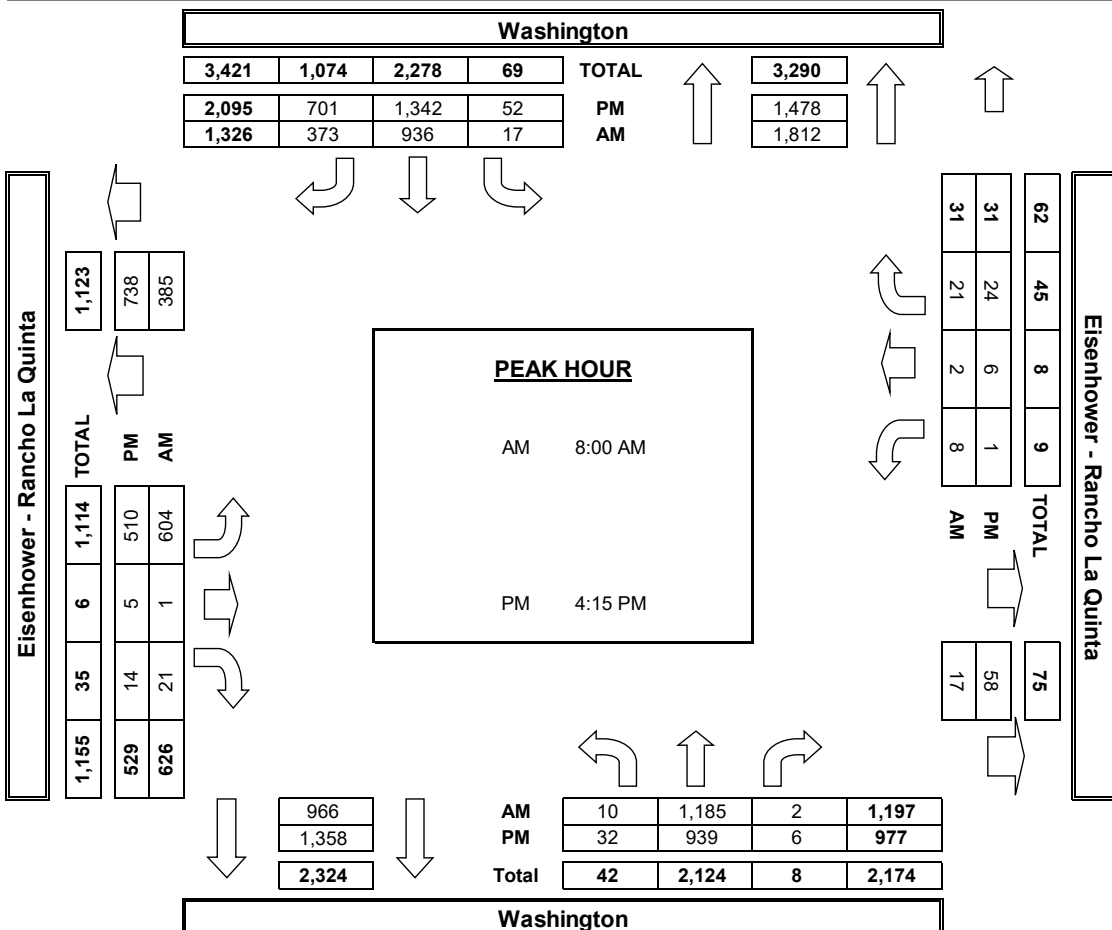
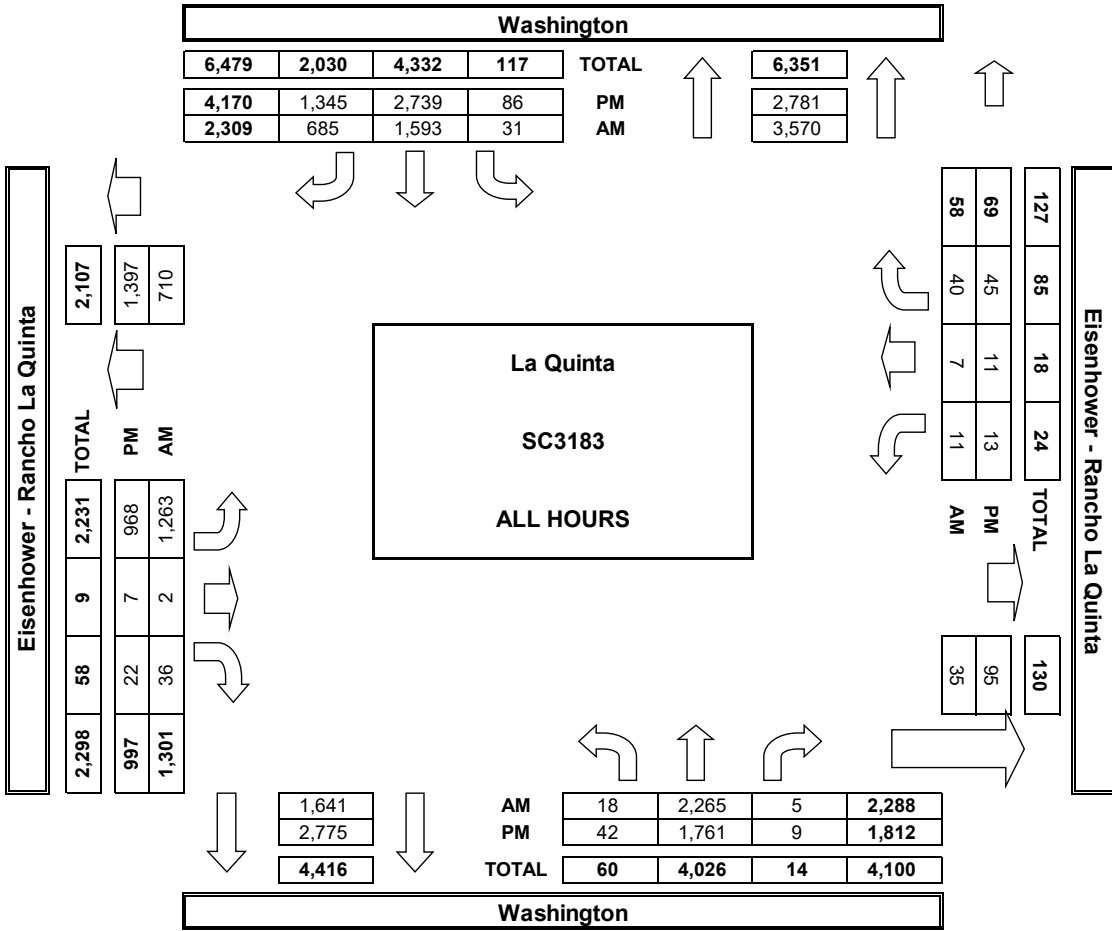
AM	PM
7:00 AM	4:00 PM
7:15 AM	4:15 PM
7:30 AM	4:30 PM
7:45 AM	4:45 PM
8:00 AM	5:00 PM
8:15 AM	5:15 PM
8:30 AM	5:30 PM
8:45 AM	5:45 PM
<b>TOTAL</b>	<b>TOTAL</b>
<b>AM BEGIN PEAK HR</b>	<b>PM BEGIN PEAK HR</b>

PEDESTRIAN + BIKE CROSSINGS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
0	1	0	0	1
0	0	7	0	7
0	1	3	1	5
1	0	0	0	1
0	1	2	0	3
0	5	4	1	10
7	1	3	0	11
3	1	1	0	5
11	10	20	2	43
8:00 AM				
0	0	1	1	2
1	0	2	0	3
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	1	0	2
0	0	0	0	0
1	1	5	1	8
4:15 PM				

PEDESTRIAN CROSSINGS				
N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
0	0	0	0	0
0	0	7	0	7
0	0	1	0	1
1	0	0	0	1
0	0	1	0	1
0	0	0	0	0
4	0	1	0	5
2	0	0	0	2
7	0	10	0	17
6	0	2	0	8
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	1	0	2
0	0	0	0	0
0	1	2	0	3
0	0	1	0	1

BICYCLE CROSSINGS				
NS	SS	ES	WS	TOTAL
0	1	0	0	1
0	0	0	0	0
0	1	2	1	4
0	0	0	0	0
0	1	1	0	2
0	5	4	1	10
3	1	2	0	6
1	1	1	0	3
4	10	10	2	26
0	0	1	1	2
1	0	1	0	2
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	3	1	5

**AimTD LLC**  
TURNING MOVEMENT COUNTS







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**APPENDIX C -**

**EXISTING CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS**



HCM 6th Signalized Intersection Summary  
 1: Washington Street & Avenue 50

Troutdale Village  
 11/23/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗↘	↗	↗	↗	↗↗↘		↗↘	↗↘↘	
Traffic Volume (veh/h)	45	134	30	116	105	315	21	824	86	150	744	53
Future Volume (veh/h)	45	134	30	116	105	315	21	824	86	150	744	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	151	34	130	118	354	24	926	97	169	836	60
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	734	161	341	539	447	68	1365	143	360	1738	124
Arrive On Green	0.07	0.25	0.25	0.10	0.29	0.29	0.04	0.29	0.29	0.10	0.36	0.36
Sat Flow, veh/h	1781	2885	631	3456	1870	1552	1781	4684	489	3456	4857	347
Grp Volume(v), veh/h	51	91	94	130	118	354	24	672	351	169	585	311
Grp Sat Flow(s),veh/h/ln	1781	1777	1740	1728	1870	1552	1781	1702	1768	1728	1702	1800
Q Serve(g_s), s	1.8	2.6	2.7	2.2	3.1	13.4	0.8	11.1	11.2	2.9	8.5	8.6
Cycle Q Clear(g_c), s	1.8	2.6	2.7	2.2	3.1	13.4	0.8	11.1	11.2	2.9	8.5	8.6
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.28	1.00		0.19
Lane Grp Cap(c), veh/h	116	452	443	341	539	447	68	992	516	360	1218	644
V/C Ratio(X)	0.44	0.20	0.21	0.38	0.22	0.79	0.35	0.68	0.68	0.47	0.48	0.48
Avail Cap(c_a), veh/h	196	808	791	379	851	706	196	1335	693	434	1388	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	18.7	18.7	26.9	17.3	20.9	29.9	19.9	20.0	26.9	15.9	15.9
Incr Delay (d2), s/veh	2.6	0.2	0.2	0.7	0.2	3.2	3.1	0.8	1.7	0.9	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.9	1.0	0.9	1.1	4.4	0.4	3.8	4.1	1.1	2.7	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	18.9	19.0	27.6	17.5	24.2	33.0	20.8	21.6	27.8	16.2	16.5
LnGrp LOS	C	B	B	C	B	C	C	C	C	C	B	B
Approach Vol, veh/h		236			602			1047			1065	
Approach Delay, s/veh		21.6			23.6			21.3			18.1	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	22.6	10.3	20.2	6.4	26.8	8.2	22.4				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	25.0	7.0	29.0	7.0	26.0	7.0	29.0				
Max Q Clear Time (g_c+I1), s	4.9	13.2	4.2	4.7	2.8	10.6	3.8	15.4				
Green Ext Time (p_c), s	0.1	4.7	0.1	0.8	0.0	4.6	0.0	1.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				20.7								
HCM 6th LOS				C								

Existing Conditions  
 Timing Plan: AM Peak



# HCM 6th Signalized Intersection Summary

## 2: Washington Street & Eisenhower Drive

Troutdale Village  
11/23/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔			↔	↔	↔	↑↑↑	↔	↔	↑↑↑	↔
Traffic Volume (veh/h)	604	1	21	8	2	21	10	1185	2	17	936	373
Future Volume (veh/h)	604	1	21	8	2	21	10	1185	2	17	936	373
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	725	0	0	9	2	24	12	1378	2	20	1088	434
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1206	422	0	116	26	121	38	1913	576	60	1975	957
Arrive On Green	0.23	0.00	0.00	0.08	0.08	0.08	0.02	0.37	0.37	0.03	0.39	0.39
Sat Flow, veh/h	5344	1870	0	1470	327	1533	1781	5106	1537	1781	5106	1548
Grp Volume(v), veh/h	725	0	0	11	0	24	12	1378	2	20	1088	434
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1797	0	1533	1781	1702	1537	1781	1702	1548
Q Serve(g_s), s	6.8	0.0	0.0	0.3	0.0	0.8	0.4	12.9	0.0	0.6	9.3	8.4
Cycle Q Clear(g_c), s	6.8	0.0	0.0	0.3	0.0	0.8	0.4	12.9	0.0	0.6	9.3	8.4
Prop In Lane	1.00		0.00	0.82		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1206	422	0	142	0	121	38	1913	576	60	1975	957
V/C Ratio(X)	0.60	0.00	0.00	0.08	0.00	0.20	0.32	0.72	0.00	0.34	0.55	0.45
Avail Cap(c_a), veh/h	3355	1174	0	1128	0	962	224	2290	689	288	2473	1107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	0.0	23.8	0.0	24.0	26.9	14.9	10.9	26.3	13.3	5.8
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.8	4.7	0.9	0.0	3.3	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.1	0.0	0.3	0.2	3.9	0.0	0.3	2.7	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	0.0	24.0	0.0	24.8	31.6	15.8	10.9	29.6	13.6	6.2
LnGrp LOS	B	A	A	C	A	C	C	B	B	C	B	A
Approach Vol, veh/h		725			35			1392			1542	
Approach Delay, s/veh		19.8			24.6			16.0			11.7	
Approach LOS		B			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	24.9		16.6	5.2	25.6		8.4				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	9.0	25.0		35.0	7.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s	2.6	14.9		8.8	2.4	11.3		2.8				
Green Ext Time (p_c), s	0.0	5.9		2.7	0.0	7.6		0.1				

### Intersection Summary

HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

### Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.

Existing Conditions  
Timing Plan: AM Peak

HCM 6th Signalized Intersection Summary  
 3: Washington Street & Avenue 48

Troutdale Village  
 11/23/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔↔	↑↑↑		↔↔	↑↑↑
Traffic Volume (veh/h)	314	288	1392	417	93	1015
Future Volume (veh/h)	314	288	1392	417	93	1015
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	353	324	1564	469	104	1140
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	635	512	1997	589	338	3469
Arrive On Green	0.18	0.18	0.51	0.51	0.10	0.68
Sat Flow, veh/h	3456	2790	4060	1147	3456	5274
Grp Volume(v), veh/h	353	324	1365	668	104	1140
Grp Sat Flow(s),veh/h/ln	1728	1395	1702	1635	1728	1702
Q Serve(g_s), s	5.4	6.3	19.0	19.7	1.6	5.4
Cycle Q Clear(g_c), s	5.4	6.3	19.0	19.7	1.6	5.4
Prop In Lane	1.00	1.00		0.70	1.00	
Lane Grp Cap(c), veh/h	635	512	1747	839	338	3469
V/C Ratio(X)	0.56	0.63	0.78	0.80	0.31	0.33
Avail Cap(c_a), veh/h	1929	1558	1889	907	473	3883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	22.0	11.6	11.7	24.5	3.9
Incr Delay (d2), s/veh	0.8	1.3	2.0	4.7	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.8	5.2	5.8	0.6	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.4	23.3	13.6	16.4	25.0	3.9
LnGrp LOS	C	C	B	B	C	A
Approach Vol, veh/h	677		2033			1244
Approach Delay, s/veh	22.8		14.5			5.7
Approach LOS	C		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.7	34.0			43.7	14.7
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	32.4			44.4	32.6
Max Q Clear Time (g_c+I1), s	3.6	21.7			7.4	8.3
Green Ext Time (p_c), s	0.1	8.3			8.7	2.5
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.2			
HCM 6th LOS			B			

Existing Conditions  
 Timing Plan: AM Peak

HCM 6th Signalized Intersection Summary  
 1: Washington Street & Avenue 50

Troutdale Village  
 11/23/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	115	18	119	91	209	11	702	61	248	990	54
Future Volume (veh/h)	42	115	18	119	91	209	11	702	61	248	990	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	121	19	125	96	220	12	739	64	261	1042	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	523	80	398	413	348	38	1245	107	470	1856	101
Arrive On Green	0.06	0.17	0.17	0.12	0.22	0.22	0.02	0.26	0.26	0.14	0.37	0.37
Sat Flow, veh/h	1781	3083	474	3456	1870	1574	1781	4787	412	3456	4955	271
Grp Volume(v), veh/h	44	69	71	125	96	220	12	524	279	261	716	383
Grp Sat Flow(s),veh/h/ln	1781	1777	1780	1728	1870	1574	1781	1702	1796	1728	1702	1821
Q Serve(g_s), s	1.2	1.7	1.7	1.7	2.1	6.3	0.3	6.8	6.8	3.5	8.3	8.4
Cycle Q Clear(g_c), s	1.2	1.7	1.7	1.7	2.1	6.3	0.3	6.8	6.8	3.5	8.3	8.4
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.23	1.00		0.15
Lane Grp Cap(c), veh/h	114	301	302	398	413	348	38	885	467	470	1275	682
V/C Ratio(X)	0.39	0.23	0.24	0.31	0.23	0.63	0.31	0.59	0.60	0.56	0.56	0.56
Avail Cap(c_a), veh/h	249	1028	1030	483	1082	911	249	1630	860	620	1766	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	18.0	18.0	20.4	16.0	17.7	24.2	16.2	16.2	20.2	12.4	12.4
Incr Delay (d2), s/veh	2.1	0.4	0.4	0.4	0.3	1.9	4.6	0.6	1.2	1.0	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.6	0.6	0.6	0.7	2.0	0.2	2.1	2.3	1.2	2.3	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	18.4	18.4	20.8	16.3	19.6	28.7	16.9	17.5	21.3	12.8	13.1
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		184			441			815			1360	
Approach Delay, s/veh		19.9			19.2			17.2			14.5	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	17.0	9.8	12.5	5.1	22.8	7.2	15.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.0	24.0	7.0	29.0	7.0	26.0	7.0	29.0				
Max Q Clear Time (g_c+I1), s	5.5	8.8	3.7	3.7	2.3	10.4	3.2	8.3				
Green Ext Time (p_c), s	0.3	4.1	0.1	0.6	0.0	5.8	0.0	1.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			16.4									
HCM 6th LOS			B									

Existing Conditions  
 Timing Plan: PM Peak

HCM 6th Signalized Intersection Summary  
2: Washington Street & Eisenhower Drive

Troutdale Village  
11/23/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔			↔	↔	↔	↑↑↑	↔	↔	↑↑↑	↔
Traffic Volume (veh/h)	510	5	14	1	6	24	32	939	6	52	1342	701
Future Volume (veh/h)	510	5	14	1	6	24	32	939	6	52	1342	701
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	549	0	0	1	6	25	33	978	6	54	1398	730
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	888	311	0	13	78	76	89	2205	669	126	2311	980
Arrive On Green	0.17	0.00	0.00	0.05	0.05	0.05	0.05	0.43	0.43	0.07	0.45	0.45
Sat Flow, veh/h	5344	1870	0	265	1592	1555	1781	5106	1549	1781	5106	1583
Grp Volume(v), veh/h	549	0	0	7	0	25	33	978	6	54	1398	730
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1857	0	1555	1781	1702	1549	1781	1702	1583
Q Serve(g_s), s	5.4	0.0	0.0	0.2	0.0	0.9	1.0	7.6	0.1	1.6	11.7	18.5
Cycle Q Clear(g_c), s	5.4	0.0	0.0	0.2	0.0	0.9	1.0	7.6	0.1	1.6	11.7	18.5
Prop In Lane	1.00		0.00	0.14		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	888	311	0	91	0	76	89	2205	669	126	2311	980
V/C Ratio(X)	0.62	0.00	0.00	0.08	0.00	0.33	0.37	0.44	0.01	0.43	0.61	0.75
Avail Cap(c_a), veh/h	3301	1155	0	1147	0	960	220	2433	738	220	2433	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	0.0	0.0	25.7	0.0	26.0	26.0	11.3	9.2	25.2	11.7	7.6
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.4	0.0	2.5	2.5	0.1	0.0	2.3	0.4	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	0.1	0.0	0.4	0.4	2.1	0.0	0.7	3.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	0.0	0.0	26.1	0.0	28.5	28.6	11.5	9.2	27.5	12.1	10.6
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h		549			32			1017			2182	
Approach Delay, s/veh		22.7			28.0			12.0			12.0	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	28.5		13.4	6.8	29.6		6.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	7.0	27.0		35.0	7.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s	3.6	9.6		7.4	3.0	20.5		2.9				
Green Ext Time (p_c), s	0.0	5.7		2.0	0.0	5.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.

Existing Conditions  
Timing Plan: PM Peak

HCM 6th Signalized Intersection Summary  
 3: Washington Street & Avenue 48

Troutdale Village  
 11/23/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔↔	↑↑↑		↔↔	↑↑↑
Traffic Volume (veh/h)	474	187	1188	288	234	1623
Future Volume (veh/h)	474	187	1188	288	234	1623
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	494	195	1238	300	244	1691
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	744	601	1701	412	459	3206
Arrive On Green	0.22	0.22	0.42	0.42	0.13	0.63
Sat Flow, veh/h	3456	2790	4250	989	3456	5274
Grp Volume(v), veh/h	494	195	1032	506	244	1691
Grp Sat Flow(s),veh/h/ln	1728	1395	1702	1666	1728	1702
Q Serve(g_s), s	6.7	3.0	13.0	13.0	3.4	9.4
Cycle Q Clear(g_c), s	6.7	3.0	13.0	13.0	3.4	9.4
Prop In Lane	1.00	1.00		0.59	1.00	
Lane Grp Cap(c), veh/h	744	601	1418	694	459	3206
V/C Ratio(X)	0.66	0.32	0.73	0.73	0.53	0.53
Avail Cap(c_a), veh/h	1760	1421	1667	816	474	3601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	16.9	12.5	12.5	20.6	5.3
Incr Delay (d2), s/veh	1.0	0.3	1.4	2.7	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.8	3.6	3.8	1.2	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	17.2	13.8	15.2	21.7	5.4
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	689		1538			1935
Approach Delay, s/veh	18.7		14.3			7.5
Approach LOS	B		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.8	25.3			36.0	15.0
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	7.0	25.0			36.0	26.0
Max Q Clear Time (g_c+I1), s	5.4	15.0			11.4	8.7
Green Ext Time (p_c), s	0.1	6.3			12.8	2.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			11.9			
HCM 6th LOS			B			

Existing Conditions  
 Timing Plan: PM Peak

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





















**APPENDIX D -**

**PROJECT COMPLETION CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS**



HCM 6th Signalized Intersection Summary  
1: Washington Street & Avenue 50

Troutdale Village  
12/28/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	143	32	142	122	336	22	861	91	173	775	56
Future Volume (veh/h)	48	143	32	142	122	336	22	861	91	173	775	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	161	36	160	137	378	25	967	102	194	871	63
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	768	167	344	559	464	69	1372	144	352	1729	125
Arrive On Green	0.07	0.27	0.27	0.10	0.30	0.30	0.04	0.29	0.29	0.10	0.36	0.36
Sat Flow, veh/h	1781	2889	629	3456	1870	1553	1781	4680	492	3456	4854	350
Grp Volume(v), veh/h	54	97	100	160	137	378	25	703	366	194	610	324
Grp Sat Flow(s),veh/h/ln	1781	1777	1741	1728	1870	1553	1781	1702	1768	1728	1702	1800
Q Serve(g_s), s	1.9	2.8	3.0	2.9	3.7	15.1	0.9	12.3	12.3	3.6	9.4	9.4
Cycle Q Clear(g_c), s	1.9	2.8	3.0	2.9	3.7	15.1	0.9	12.3	12.3	3.6	9.4	9.4
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.28	1.00		0.19
Lane Grp Cap(c), veh/h	118	472	463	344	559	464	69	998	518	352	1213	641
V/C Ratio(X)	0.46	0.21	0.22	0.47	0.25	0.81	0.36	0.70	0.71	0.55	0.50	0.51
Avail Cap(c_a), veh/h	187	772	756	362	813	675	187	1275	662	414	1326	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	19.0	19.1	28.4	17.7	21.7	31.3	21.0	21.0	28.5	16.9	16.9
Incr Delay (d2), s/veh	2.7	0.2	0.2	1.0	0.2	5.0	3.1	1.3	2.5	1.3	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.0	1.1	1.1	1.4	5.2	0.4	4.3	4.6	1.4	3.1	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	19.3	19.3	29.4	17.9	26.7	34.4	22.3	23.5	29.9	17.2	17.5
LnGrp LOS	C	B	B	C	B	C	C	C	C	C	B	B
Approach Vol, veh/h		251			675			1094			1128	
Approach Delay, s/veh		22.2			25.5			23.0			19.4	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	23.6	10.6	21.7	6.6	27.8	8.4	23.9				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	25.0	7.0	29.0	7.0	26.0	7.0	29.0				
Max Q Clear Time (g_c+I1), s	5.6	14.3	4.9	5.0	2.9	11.4	3.9	17.1				
Green Ext Time (p_c), s	0.1	4.6	0.1	0.9	0.0	4.7	0.0	1.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				22.2								
HCM 6th LOS				C								

HCM 6th Signalized Intersection Summary  
2: Washington Street & Eisenhower Drive

Troutdale Village  
12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔			↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	629	2	25	9	3	22	19	1274	3	18	988	389
Future Volume (veh/h)	629	2	25	9	3	22	19	1274	3	18	988	389
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	759	0	0	10	3	26	22	1481	3	21	1149	452
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1226	429	0	114	34	126	64	1940	584	62	1933	950
Arrive On Green	0.23	0.00	0.00	0.08	0.08	0.08	0.04	0.38	0.38	0.03	0.38	0.38
Sat Flow, veh/h	5344	1870	0	1385	416	1531	1781	5106	1537	1781	5106	1548
Grp Volume(v), veh/h	759	0	0	13	0	26	22	1481	3	21	1149	452
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1801	0	1531	1781	1702	1537	1781	1702	1548
Q Serve(g_s), s	7.5	0.0	0.0	0.4	0.0	0.9	0.7	14.8	0.1	0.7	10.6	9.5
Cycle Q Clear(g_c), s	7.5	0.0	0.0	0.4	0.0	0.9	0.7	14.8	0.1	0.7	10.6	9.5
Prop In Lane	1.00		0.00	0.77		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1226	429	0	149	0	126	64	1940	584	62	1933	950
V/C Ratio(X)	0.62	0.00	0.00	0.09	0.00	0.21	0.34	0.76	0.01	0.34	0.59	0.48
Avail Cap(c_a), veh/h	3198	1119	0	1078	0	916	213	2182	657	274	2357	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	24.8	0.0	25.0	27.5	15.8	11.3	27.6	14.6	6.3
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.8	3.1	1.5	0.0	3.2	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	0.2	0.0	0.3	0.3	4.6	0.0	0.3	3.2	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	25.1	0.0	25.8	30.7	17.3	11.3	30.8	14.9	6.7
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	A
Approach Vol, veh/h		759			39			1506			1622	
Approach Delay, s/veh		20.8			25.6			17.5			12.8	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	26.2		17.4	6.1	26.1		8.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	9.0	25.0		35.0	7.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s	2.7	16.8		9.5	2.7	12.6		2.9				
Green Ext Time (p_c), s	0.0	5.3		2.9	0.0	7.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.



HCM 6th Signalized Intersection Summary  
 3: Washington Street & Avenue 48

Troutdale Village  
 12/28/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	331	300	1478	446	97	1066
Future Volume (veh/h)	331	300	1478	446	97	1066
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	372	337	1661	501	109	1198
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	648	523	2013	592	336	3473
Arrive On Green	0.19	0.19	0.52	0.52	0.10	0.68
Sat Flow, veh/h	3456	2790	4063	1145	3456	5274
Grp Volume(v), veh/h	372	337	1446	716	109	1198
Grp Sat Flow(s),veh/h/ln	1728	1395	1702	1636	1728	1702
Q Serve(g_s), s	5.9	6.7	21.6	22.7	1.8	5.9
Cycle Q Clear(g_c), s	5.9	6.7	21.6	22.7	1.8	5.9
Prop In Lane	1.00	1.00		0.70	1.00	
Lane Grp Cap(c), veh/h	648	523	1759	845	336	3473
V/C Ratio(X)	0.57	0.64	0.82	0.85	0.32	0.34
Avail Cap(c_a), veh/h	1858	1500	1830	879	457	3759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	22.7	12.3	12.5	25.4	4.0
Incr Delay (d2), s/veh	0.8	1.3	3.1	7.5	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.0	6.2	7.3	0.7	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.2	24.0	15.3	20.1	26.0	4.1
LnGrp LOS	C	C	B	C	C	A
Approach Vol, veh/h	709		2162			1307
Approach Delay, s/veh	23.6		16.9			5.9
Approach LOS	C		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.9	35.2			45.1	15.3
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	32.5			44.5	32.5
Max Q Clear Time (g_c+I1), s	3.8	24.7			7.9	8.7
Green Ext Time (p_c), s	0.1	6.5			9.3	2.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.6			
HCM 6th LOS			B			

HCM 6th Signalized Intersection Summary  
 1: Washington Street & Avenue 50

Troutdale Village  
 12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	48	128	19	137	103	223	12	739	68	309	1030	57
Future Volume (veh/h)	48	128	19	137	103	223	12	739	68	309	1030	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	135	20	144	108	235	13	778	72	325	1084	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	546	79	406	417	351	41	1270	117	460	1866	103
Arrive On Green	0.07	0.18	0.18	0.12	0.22	0.22	0.02	0.27	0.27	0.13	0.38	0.38
Sat Flow, veh/h	1781	3109	452	3456	1870	1574	1781	4757	438	3456	4951	274
Grp Volume(v), veh/h	51	76	79	144	108	235	13	556	294	325	745	399
Grp Sat Flow(s),veh/h/ln	1781	1777	1784	1728	1870	1574	1781	1702	1791	1728	1702	1821
Q Serve(g_s), s	1.4	1.9	2.0	2.0	2.5	7.1	0.4	7.5	7.5	4.7	9.1	9.1
Cycle Q Clear(g_c), s	1.4	1.9	2.0	2.0	2.5	7.1	0.4	7.5	7.5	4.7	9.1	9.1
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.24	1.00		0.15
Lane Grp Cap(c), veh/h	125	312	313	406	417	351	41	909	478	460	1283	686
V/C Ratio(X)	0.41	0.24	0.25	0.35	0.26	0.67	0.32	0.61	0.62	0.71	0.58	0.58
Avail Cap(c_a), veh/h	239	988	993	464	1040	876	239	1567	824	597	1698	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	18.5	18.5	21.2	16.7	18.5	25.1	16.7	16.8	21.6	13.0	13.0
Incr Delay (d2), s/veh	2.1	0.4	0.4	0.5	0.3	2.2	4.3	0.7	1.3	2.6	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.7	0.7	0.7	0.9	2.3	0.2	2.4	2.6	1.7	2.6	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	18.9	19.0	21.7	17.0	20.7	29.4	17.4	18.1	24.3	13.4	13.7
LnGrp LOS	C	B	B	C	B	C	C	B	B	C	B	B
Approach Vol, veh/h		206			487			863			1469	
Approach Delay, s/veh		20.5			20.2			17.8			15.9	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	17.9	10.1	13.2	5.2	23.6	7.7	15.6				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.0	24.0	7.0	29.0	7.0	26.0	7.0	29.0				
Max Q Clear Time (g_c+I1), s	6.7	9.5	4.0	4.0	2.4	11.1	3.4	9.1				
Green Ext Time (p_c), s	0.3	4.2	0.1	0.7	0.0	5.9	0.0	1.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.4								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary  
2: Washington Street & Eisenhower Drive

Troutdale Village  
12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↔			↖	↗	↖	↗↘↙	↗	↖	↗↘↙	↗
Traffic Volume (veh/h)	531	6	23	2	7	25	39	1003	7	55	1439	730
Future Volume (veh/h)	531	6	23	2	7	25	39	1003	7	55	1439	730
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	580	0	0	2	7	26	41	1045	7	57	1499	760
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	914	320	0	21	75	81	103	2214	672	128	2285	980
Arrive On Green	0.17	0.00	0.00	0.05	0.05	0.05	0.06	0.43	0.43	0.07	0.45	0.45
Sat Flow, veh/h	5344	1870	0	411	1439	1554	1781	5106	1549	1781	5106	1583
Grp Volume(v), veh/h	580	0	0	9	0	26	41	1045	7	57	1499	760
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1850	0	1554	1781	1702	1549	1781	1702	1583
Q Serve(g_s), s	5.9	0.0	0.0	0.3	0.0	1.0	1.3	8.6	0.2	1.8	13.5	20.7
Cycle Q Clear(g_c), s	5.9	0.0	0.0	0.3	0.0	1.0	1.3	8.6	0.2	1.8	13.5	20.7
Prop In Lane	1.00		0.00	0.22		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	914	320	0	96	0	81	103	2214	672	128	2285	980
V/C Ratio(X)	0.63	0.00	0.00	0.09	0.00	0.32	0.40	0.47	0.01	0.44	0.66	0.78
Avail Cap(c_a), veh/h	3175	1111	0	1099	0	923	212	2340	710	212	2340	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	26.6	0.0	26.9	26.8	11.9	9.5	26.2	12.7	8.2
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.4	0.0	2.3	2.4	0.2	0.0	2.4	0.7	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	0.1	0.0	0.4	0.6	2.4	0.0	0.8	3.8	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	0.0	0.0	27.0	0.0	29.2	29.2	12.0	9.5	28.6	13.4	12.1
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h		580			35			1093			2316	
Approach Delay, s/veh		23.4			28.7			12.7			13.3	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	29.5		14.1	7.4	30.4		7.1				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	7.0	27.0		35.0	7.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s	3.8	10.6		7.9	3.3	22.7		3.0				
Green Ext Time (p_c), s	0.0	6.0		2.1	0.0	3.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Washington Street & Avenue 48

Troutdale Village  
 12/28/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	506	195	1254	308	244	1718
Future Volume (veh/h)	506	195	1254	308	244	1718
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	527	203	1306	321	254	1790
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	772	624	1714	421	446	3194
Arrive On Green	0.22	0.22	0.42	0.42	0.13	0.63
Sat Flow, veh/h	3456	2790	4238	999	3456	5274
Grp Volume(v), veh/h	527	203	1092	535	254	1790
Grp Sat Flow(s),veh/h/ln	1728	1395	1702	1664	1728	1702
Q Serve(g_s), s	7.4	3.2	14.5	14.5	3.7	10.7
Cycle Q Clear(g_c), s	7.4	3.2	14.5	14.5	3.7	10.7
Prop In Lane	1.00	1.00		0.60	1.00	
Lane Grp Cap(c), veh/h	772	624	1434	701	446	3194
V/C Ratio(X)	0.68	0.33	0.76	0.76	0.57	0.56
Avail Cap(c_a), veh/h	1695	1369	1606	785	456	3468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	17.2	13.1	13.1	21.7	5.7
Incr Delay (d2), s/veh	1.1	0.3	2.0	4.0	1.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.9	4.2	4.5	1.3	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.9	17.5	15.0	17.1	23.3	5.9
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	730		1627			2044
Approach Delay, s/veh	19.3		15.7			8.1
Approach LOS	B		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.8	26.3			37.2	15.8
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	7.0	25.0			36.0	26.0
Max Q Clear Time (g_c+I1), s	5.7	16.5			12.7	9.4
Green Ext Time (p_c), s	0.1	5.8			13.3	2.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			12.7			
HCM 6th LOS			B			

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**APPENDIX E -**

**CUMULATIVE PROJECT TRIP DISTRIBUTION**





**LEGEND** # Intersection ●



**INTEGRATED ENGINEERING GROUP**  
TRANSPORTATION PLANNING AND ENGINEERING

Crossing at La Quinta  
Project Study Area and Trip Distribution  
Figure 1-2

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**APPENDIX F -**

**CUMULATIVE CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS**



HCM 6th Signalized Intersection Summary  
 1: Washington Street & Avenue 50

Troutdale Village  
 12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	48	144	32	146	126	338	22	873	91	177	775	56
Future Volume (veh/h)	48	144	32	146	126	338	22	873	91	177	775	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	162	36	164	142	380	25	981	102	199	871	63
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	771	167	343	560	465	69	1380	143	351	1734	125
Arrive On Green	0.07	0.27	0.27	0.10	0.30	0.30	0.04	0.29	0.29	0.10	0.36	0.36
Sat Flow, veh/h	1781	2893	626	3456	1870	1553	1781	4687	486	3456	4854	350
Grp Volume(v), veh/h	54	98	100	164	142	380	25	712	371	199	610	324
Grp Sat Flow(s),veh/h/ln	1781	1777	1742	1728	1870	1553	1781	1702	1769	1728	1702	1800
Q Serve(g_s), s	2.0	2.9	3.0	3.0	3.9	15.2	0.9	12.5	12.6	3.7	9.4	9.5
Cycle Q Clear(g_c), s	2.0	2.9	3.0	3.0	3.9	15.2	0.9	12.5	12.6	3.7	9.4	9.5
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.27	1.00		0.19
Lane Grp Cap(c), veh/h	118	474	464	343	560	465	69	1002	521	351	1216	643
V/C Ratio(X)	0.46	0.21	0.22	0.48	0.25	0.82	0.36	0.71	0.71	0.57	0.50	0.50
Avail Cap(c_a), veh/h	186	767	752	360	807	670	186	1266	658	411	1317	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	19.1	19.2	28.6	17.8	21.8	31.5	21.1	21.2	28.8	16.9	16.9
Incr Delay (d2), s/veh	2.8	0.2	0.2	1.0	0.2	5.2	3.1	1.4	2.7	1.4	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.1	1.1	1.2	1.5	5.3	0.4	4.4	4.8	1.4	3.1	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	19.3	19.4	29.6	18.1	27.0	34.6	22.5	23.8	30.2	17.2	17.5
LnGrp LOS	C	B	B	C	B	C	C	C	C	C	B	B
Approach Vol, veh/h		252			686			1108			1133	
Approach Delay, s/veh		22.3			25.8			23.2			19.6	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	23.8	10.7	21.9	6.6	28.0	8.4	24.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	25.0	7.0	29.0	7.0	26.0	7.0	29.0				
Max Q Clear Time (g_c+I1), s	5.7	14.6	5.0	5.0	2.9	11.5	4.0	17.2				
Green Ext Time (p_c), s	0.1	4.6	0.1	0.9	0.0	4.7	0.0	1.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				22.4								
HCM 6th LOS				C								

Cumulative Conditions  
 Timing Plan: AM Peak



# HCM 6th Signalized Intersection Summary

## 2: Washington Street & Eisenhower Drive

Troutdale Village  
12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	2	26	9	3	22	21	1286	3	18	992	389
Future Volume (veh/h)	629	2	26	9	3	22	21	1286	3	18	992	389
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	760	0	0	10	3	26	24	1495	3	21	1153	452
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1226	429	0	114	34	126	69	1946	586	62	1925	947
Arrive On Green	0.23	0.00	0.00	0.08	0.08	0.08	0.04	0.38	0.38	0.03	0.38	0.38
Sat Flow, veh/h	5344	1870	0	1385	416	1531	1781	5106	1537	1781	5106	1548
Grp Volume(v), veh/h	760	0	0	13	0	26	24	1495	3	21	1153	452
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1801	0	1531	1781	1702	1537	1781	1702	1548
Q Serve(g_s), s	7.5	0.0	0.0	0.4	0.0	0.9	0.8	15.0	0.1	0.7	10.7	9.5
Cycle Q Clear(g_c), s	7.5	0.0	0.0	0.4	0.0	0.9	0.8	15.0	0.1	0.7	10.7	9.5
Prop In Lane	1.00		0.00	0.77		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1226	429	0	148	0	126	69	1946	586	62	1925	947
V/C Ratio(X)	0.62	0.00	0.00	0.09	0.00	0.21	0.35	0.77	0.01	0.34	0.60	0.48
Avail Cap(c_a), veh/h	3187	1115	0	1074	0	913	212	2175	655	273	2349	1076
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	24.9	0.0	25.1	27.5	15.9	11.3	27.7	14.7	6.4
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.8	3.0	1.5	0.0	3.2	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.0	0.2	0.0	0.3	0.3	4.7	0.0	0.3	3.2	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	25.1	0.0	25.9	30.5	17.4	11.3	30.9	15.0	6.8
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	A
Approach Vol, veh/h		760			39			1522			1626	
Approach Delay, s/veh		20.8			25.7			17.6			12.9	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	26.4		17.5	6.3	26.1		8.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	9.0	25.0		35.0	7.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s	2.7	17.0		9.5	2.8	12.7		2.9				
Green Ext Time (p_c), s	0.0	5.3		2.9	0.0	7.6		0.1				

### Intersection Summary

HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Washington Street & Avenue 48

Troutdale Village  
 12/28/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	332	300	1486	450	97	1068
Future Volume (veh/h)	332	300	1486	450	97	1068
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	373	337	1670	506	109	1200
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	648	523	2013	594	336	3475
Arrive On Green	0.19	0.19	0.52	0.52	0.10	0.68
Sat Flow, veh/h	3456	2790	4060	1148	3456	5274
Grp Volume(v), veh/h	373	337	1455	721	109	1200
Grp Sat Flow(s),veh/h/ln	1728	1395	1702	1635	1728	1702
Q Serve(g_s), s	6.0	6.8	21.8	23.0	1.8	5.9
Cycle Q Clear(g_c), s	6.0	6.8	21.8	23.0	1.8	5.9
Prop In Lane	1.00	1.00		0.70	1.00	
Lane Grp Cap(c), veh/h	648	523	1761	846	336	3475
V/C Ratio(X)	0.58	0.64	0.83	0.85	0.32	0.35
Avail Cap(c_a), veh/h	1854	1497	1826	877	456	3751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	22.7	12.3	12.6	25.5	4.0
Incr Delay (d2), s/veh	0.8	1.3	3.2	7.9	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.0	6.3	7.4	0.7	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.2	24.1	15.5	20.5	26.1	4.1
LnGrp LOS	C	C	B	C	C	A
Approach Vol, veh/h	710		2176			1309
Approach Delay, s/veh	23.6		17.2			5.9
Approach LOS	C		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.9	35.3			45.2	15.4
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	32.5			44.5	32.5
Max Q Clear Time (g_c+I1), s	3.8	25.0			7.9	8.8
Green Ext Time (p_c), s	0.1	6.3			9.4	2.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.8			
HCM 6th LOS			B			

Cumulative Conditions  
 Timing Plan: AM Peak

HCM 6th Signalized Intersection Summary  
 1: Washington Street & Avenue 50

Troutdale Village  
 12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	48	132	19	139	105	224	12	746	68	323	1030	57
Future Volume (veh/h)	48	132	19	139	105	224	12	746	68	323	1030	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	139	20	146	111	236	13	785	72	340	1084	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	549	78	405	417	351	41	1272	116	470	1883	104
Arrive On Green	0.07	0.18	0.18	0.12	0.22	0.22	0.02	0.27	0.27	0.14	0.38	0.38
Sat Flow, veh/h	1781	3122	441	3456	1870	1574	1781	4761	434	3456	4951	274
Grp Volume(v), veh/h	51	78	81	146	111	236	13	560	297	340	745	399
Grp Sat Flow(s),veh/h/ln	1781	1777	1786	1728	1870	1574	1781	1702	1792	1728	1702	1821
Q Serve(g_s), s	1.4	2.0	2.1	2.1	2.6	7.2	0.4	7.6	7.7	5.0	9.1	9.2
Cycle Q Clear(g_c), s	1.4	2.0	2.1	2.1	2.6	7.2	0.4	7.6	7.7	5.0	9.1	9.2
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.24	1.00		0.15
Lane Grp Cap(c), veh/h	124	312	314	405	417	351	41	910	479	470	1294	692
V/C Ratio(X)	0.41	0.25	0.26	0.36	0.27	0.67	0.32	0.62	0.62	0.72	0.58	0.58
Avail Cap(c_a), veh/h	237	978	983	459	1029	867	237	1551	816	590	1680	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	18.7	18.7	21.4	16.9	18.7	25.3	16.9	17.0	21.8	13.0	13.0
Incr Delay (d2), s/veh	2.2	0.4	0.4	0.5	0.3	2.2	4.3	0.7	1.3	3.3	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.7	0.7	0.7	0.9	2.3	0.2	2.4	2.6	1.9	2.6	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	19.1	19.2	22.0	17.2	20.9	29.7	17.6	18.3	25.1	13.4	13.7
LnGrp LOS	C	B	B	C	B	C	C	B	B	C	B	B
Approach Vol, veh/h		210			493			870			1484	
Approach Delay, s/veh		20.7			20.4			18.0			16.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.2	18.1	10.2	13.3	5.2	24.0	7.7	15.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.0	24.0	7.0	29.0	7.0	26.0	7.0	29.0				
Max Q Clear Time (g_c+I1), s	7.0	9.7	4.1	4.1	2.4	11.2	3.4	9.2				
Green Ext Time (p_c), s	0.3	4.3	0.1	0.7	0.0	5.9	0.0	1.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.7								
HCM 6th LOS				B								

Cumulative Conditions  
 Timing Plan: PM Peak

HCM 6th Signalized Intersection Summary  
2: Washington Street & Eisenhower Drive

Troutdale Village  
12/28/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔			↔	↔	↔	↑↑↑	↔	↔	↑↑↑	↔
Traffic Volume (veh/h)	531	6	25	2	7	25	40	1010	7	55	1451	730
Future Volume (veh/h)	531	6	25	2	7	25	40	1010	7	55	1451	730
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	582	0	0	2	7	26	42	1052	7	57	1511	760
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	915	320	0	21	74	80	105	2216	672	128	2282	979
Arrive On Green	0.17	0.00	0.00	0.05	0.05	0.05	0.06	0.43	0.43	0.07	0.45	0.45
Sat Flow, veh/h	5344	1870	0	411	1439	1554	1781	5106	1549	1781	5106	1583
Grp Volume(v), veh/h	582	0	0	9	0	26	42	1052	7	57	1511	760
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1850	0	1554	1781	1702	1549	1781	1702	1583
Q Serve(g_s), s	6.0	0.0	0.0	0.3	0.0	1.0	1.3	8.7	0.2	1.8	13.7	20.8
Cycle Q Clear(g_c), s	6.0	0.0	0.0	0.3	0.0	1.0	1.3	8.7	0.2	1.8	13.7	20.8
Prop In Lane	1.00		0.00	0.22		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	915	320	0	96	0	80	105	2216	672	128	2282	979
V/C Ratio(X)	0.64	0.00	0.00	0.09	0.00	0.32	0.40	0.47	0.01	0.44	0.66	0.78
Avail Cap(c_a), veh/h	3167	1109	0	1096	0	921	211	2335	708	211	2335	995
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	0.0	26.7	0.0	27.0	26.8	11.9	9.5	26.3	12.8	8.3
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.4	0.0	2.3	2.4	0.2	0.0	2.4	0.7	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	0.1	0.0	0.4	0.6	2.5	0.0	0.8	3.9	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	0.0	0.0	27.1	0.0	29.3	29.2	12.1	9.5	28.7	13.5	12.1
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h		582			35			1101			2328	
Approach Delay, s/veh		23.5			28.7			12.7			13.4	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	29.6		14.1	7.5	30.4		7.1				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	7.0	27.0		35.0	7.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s	3.8	10.7		8.0	3.3	22.8		3.0				
Green Ext Time (p_c), s	0.0	6.0		2.1	0.0	3.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Washington Street & Avenue 48

Troutdale Village  
 12/28/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔↔	↑↑↑		↔↔	↑↑↑
Traffic Volume (veh/h)	510	195	1259	310	244	1726
Future Volume (veh/h)	510	195	1259	310	244	1726
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	531	203	1311	323	254	1798
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	776	626	1713	422	444	3191
Arrive On Green	0.22	0.22	0.42	0.42	0.13	0.63
Sat Flow, veh/h	3456	2790	4236	1001	3456	5274
Grp Volume(v), veh/h	531	203	1097	537	254	1798
Grp Sat Flow(s),veh/h/ln	1728	1395	1702	1664	1728	1702
Q Serve(g_s), s	7.5	3.2	14.6	14.7	3.7	10.8
Cycle Q Clear(g_c), s	7.5	3.2	14.6	14.7	3.7	10.8
Prop In Lane	1.00	1.00		0.60	1.00	
Lane Grp Cap(c), veh/h	776	626	1434	701	444	3191
V/C Ratio(X)	0.68	0.32	0.76	0.77	0.57	0.56
Avail Cap(c_a), veh/h	1690	1364	1600	782	455	3457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	17.2	13.1	13.1	21.8	5.8
Incr Delay (d2), s/veh	1.1	0.3	2.0	4.1	1.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.9	4.2	4.6	1.3	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.0	17.5	15.2	17.3	23.4	6.0
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	734		1634			2052
Approach Delay, s/veh	19.3		15.9			8.1
Approach LOS	B		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.8	26.4			37.2	15.9
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	7.0	25.0			36.0	26.0
Max Q Clear Time (g_c+I1), s	5.7	16.7			12.8	9.5
Green Ext Time (p_c), s	0.1	5.7			13.3	2.5

Intersection Summary						
HCM 6th Ctrl Delay			12.8			
HCM 6th LOS			B			

Cumulative Conditions  
 Timing Plan: PM Peak

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
**APPENDIX G -**  
**TRANSIT ROUTE INFORMATION**

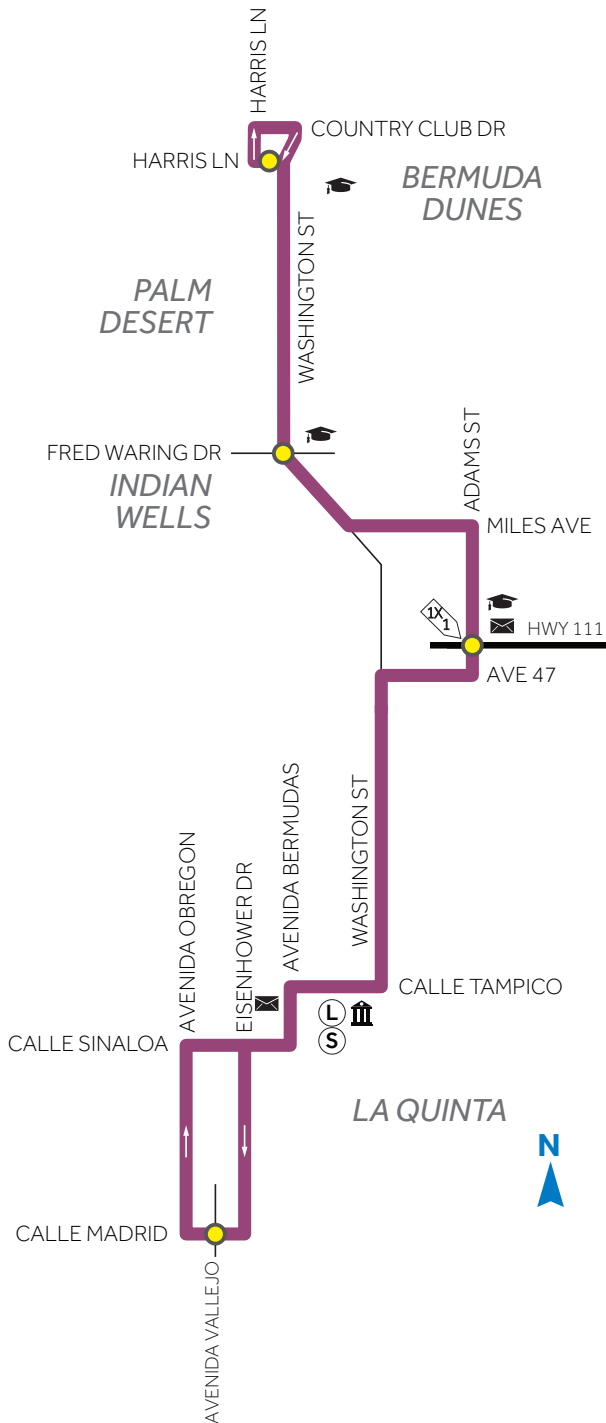


**ROUTE  
RUTA  
7**

**BERMUDA DUNES  
INDIAN WELLS  
LA QUINTA**

**LEVEL 2 SCHEDULE 7 DAYS  
NIVEL 2 HORARIO 7 DÍAS**

-  ROUTE / RUTA
-  CITY HALL / AYUNTAMIENTO
-  SCHOOL / ESCUELA
-  LIBRARY / BIBLIOTECA
-  SENIOR CENTER / CENTRO PARA ADULTOS MAYORES
-  POST OFFICE / OFICINA POSTAL
-  TIMEPOINT / PUNTO DE TIEMPO
-  TRANSFER POINT / PUNTO DE TRANSFERENCIA





BERMUDA DUNES  
INDIAN WELLS  
LA QUINTA

LEVEL 2 SCHEDULE 7 DAYS  
NIVEL 2 HORARIO 7 DÍAS

## NORTHBOUND | HACIA EL NORTE

	Calle Madrid @ Avenida Vallejo	Adams @ Hwy 711	Washington @ Fred Waring	Harris Lane @ Washington
5:45a	6:08a	6:15a	6:20a	
7:15a	7:39a	7:45a	7:50a	
8:45a	9:09a	9:15a	9:20a	
10:15a	10:39a	10:47a	10:54a	
11:45a	12:09p	12:17p	12:24p	
1:15p	1:39p	1:47p	1:54p	
2:45p	3:09p	3:17p	3:24p	
4:15p	4:39p	4:47p	4:54p	
5:45p	6:08p	6:14p	6:19p	
7:15p	7:38p	7:44p	7:49p	
8:45p	9:08p	9:15p	9:20p	

## SOUTHBOUND | HACIA EL SUR

	Harris Lane @ Washington	Washington @ Fred Waring	Adams @ Hwy 711	Calle Madrid @ Avenida Vallejo
5:10a	5:18a	5:24a	5:39a	
6:40a	6:49a	6:56a	7:14a	
8:10a	8:19a	8:26a	8:44a	
9:40a	9:49a	9:56a	10:14a	
11:10a	11:19a	11:26a	11:44a	
12:40p	12:49p	12:56p	1:14p	
2:10p	2:19p	2:26p	2:44p	
3:40p	3:49p	3:56p	4:14p	
5:10p	5:20p	5:27p	5:44p	
6:40p	6:50p	6:57p	7:14p	
8:10p	8:18p	8:24p	8:39p	

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