

Traffic Impact Study
Woodland Pacific Development
Stamford, Connecticut

August 2018

City of Stamford Zoning Board Application

Office of the State Traffic Administration (OSTA)
Administrative Decision Review



146 Hartford Road
Manchester, CT 06040

Prepared for:
Woodland Pacific, LLC
1 Elmcroft Road – Suite 500
Stamford, CT 06902

Table of Contents

Traffic Impact Study Woodland Pacific Development Stamford, Connecticut

Summary Sheet	iii
1 Introduction	1
2 Existing Condition.....	1
2.1 Site of Development	1
2.2 Adjacent Roadway Network.....	1
2.3 Study Area Intersections	2
2.4 Existing Traffic Volumes	3
3 Background Traffic Conditions.....	3
3.1 CTDOT Approved Volumes	3
3.2 Planned Roadway Improvements	3
4 Proposed Conditions.....	3
4.1 Development and Parking.....	3
4.2 Site Access and Circulation	4
4.3 Trip Generation	4
4.4 Trip Distribution	4
4.5 Combined Volumes.....	5
5 Analyses	5
5.1 Crash Data Analysis	5
5.2 Intersection Sight Distance Analysis	6
5.3 Intersection Capacity Analysis.....	6
6 Conclusions & Recommendations	8



Table of Contents

(Continued)

Traffic Impact Study Woodland Pacific Development Stamford, Connecticut

Appendices

End of Report

Appendix A - Tables

1. Peak Hour Site Generated Traffic Volumes
2. Intersection Crash Data Summary
3. Unsignalized Intersection Level of Service Summary
4. Signalized Intersection Level of Service Summary

Appendix B - Figures

1. Site Location Map
2. 2018 Existing Traffic Volumes
3. 2019 Background Traffic Conditions
4. Site Generated Traffic Arrival/Departure Distribution
5. Site Generated Traffic Volumes
6. 2019 Combined Traffic Volumes

Appendix C

Intersection Capacity Analysis Worksheets – Morning Peak Hour

Appendix D

Intersection Capacity Analysis Worksheets – Afternoon Peak Hour

Appendix E

Crash Data Records

Summary Sheet

As an aid to reviewers, this Summary Sheet has been included to outline the various study parameters utilized in this report. Although a full explanation of the study methodologies is included in the text of the report, this summary can serve as a useful reference for reviewers.

Applicant:

Woodland Pacific, LLC

Development Size/Type:

540 high-rise apartment units

Parking:

675 parking spaces

Applications:

City of Stamford Zoning Board

Office of the State Traffic Administration (OSTA) Administrative Decision Review

Build Year:

2019

Expected Trip Generation:

Morning Peak Hour – 118 trips (28 entering, 90 exiting)

Afternoon Peak Hour – 137 trips (84 entering, 53 exiting)

Capacity Analysis:

Technique – 2000/2010 Highway Capacity Manual

Execution – Synchro Professional Software, Version 10.0

1 Introduction

Woodland Pacific, LLC proposes to construct a new residential development with 540 apartment units on the parcel bounded by Woodland Avenue to the north, Pacific Street to the east, Walter Wheeler Drive to the south, and South Commons Road to the west, as shown in *Figure No. 1 of Appendix B*. The site is located to the south of Interstate 95 and the Stamford Transportation Center in the south end of Stamford and has an expected build year of 2019.

Fuss & O'Neill has been retained to study the impact of the proposed development on traffic conditions throughout the adjacent roadway network. This report has been prepared to document the findings of the study and is being submitted to the City of Stamford Zoning Board in support of a land use application. This report is also being submitted to the Office of the State Traffic Administration (OSTA) in support of an Administrative Decision Review.

2 Existing Condition

2.1 Site of Development

The site of development consists of several lots that were historically used as a waste transfer facility. The site will be accessible to residents from Pacific Street and South Commons Road with additional loading dock access to Woodland Avenue and Walter Wheeler Drive. The site is currently zoned partially as part of the "South End Redevelopment District South" with the remainder falling in a "General Industrial", "Multiple Family Residence" and "Community Business" zones. Driveways to the site will be strategically located to provide the safest access to the site given its proposed configuration.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Pacific Street
- Atlantic Street
- Woodland Avenue
- Walter Wheeler Drive

Pacific Street runs north to south through the study area beginning at Harbor Point Road, just west of Washington Boulevard, in the south and ending just north of Dock Street. It is a two lane road with on street parking on both sides and several CT Transit bus stops. It is classified by the Connecticut Department of Transportation (CTDOT) as an urban collector roadway along a portion of its length in the vicinity of the site. Lane widths vary from 12 to 15 feet based on the bike lane and shoulder configuration. The speed limit on this roadway is 30 miles per hour. Land uses along the roadway consist of a mix of mixed-use, residential and industrial land uses.

Atlantic Street also runs north to south through the area of study from Broad Street in the north to Washington Boulevard in the south. It is a two lane road with painted shared lane markings for cyclists

and lane widths that vary between 15 and 16 feet. On-street parking and CT Transit bus stops are located along the street on both sides. This roadway is also classified as an urban collector with a speed limit of 25 miles per hour. Land uses along the roadway consist of a mix of mixed-use, residential and industrial land uses.

Woodland Avenue is a local urban road that runs east to west between Atlantic Street and Pacific Street. It is a two lane road with on-street parking and shared lane markings for bicyclists on both sides. Lanes are 13 feet wide and the speed limit is 25 miles per hour. Woodland Avenue provides access to primarily residential land uses.

Walter Wheeler Drive is a local urban roadway that runs east to west between Atlantic Street and Pacific Street. It has a speed limit of 25 miles per hour and a lane width of 11 feet in the westbound direction with a lane width of 18 feet in the eastbound direction. The eastbound lane is wider due to the inclusion of on-street parking and shared lane use markings for bicyclists. Land use along this road primarily consists of the "South End Redevelopment District south" zone.

2.3 Study Area Intersections

The following study area intersections were reviewed:

- Pacific Street at Walter Wheeler Drive/East Walnut Street
- Pacific Street at Woodland Avenue/Ludlow Street
- Atlantic Street at Woodland Avenue
- Atlantic Street at Walter Wheeler Drive

The intersection of Pacific Street and Walter Wheeler Drive/East Walnut Street is four-way stop-controlled intersection with a one-lane approach from each direction. Sidewalks are provided on each leg of the intersection along with three crosswalks, excluding the northern crossing of Pacific Street. Land use adjacent to the intersection is residential and mixed use.

The intersection of Pacific Street and Woodland Avenue/Ludlow Street is a four-way signalized intersection. The approaches from all directions except for Ludlow Street are one-lane approaches which allow for all turning movements in any direction. Ludlow Street is a one-way road traveling westbound, toward the intersection. Ludlow Street provides a two lane approach with a dedicated left-turn lane and a shared through/right turn lane. Sidewalks are provided on each leg of the intersection along with crosswalks across all four lanes with shared lane markings, "sharrows" continuing down Woodland Avenue towards Atlantic Street.

The intersection of Atlantic Street and Woodland Avenue is an unsignalized "T" style intersection. Northbound and southbound traffic moves freely on Atlantic Street while westbound traffic from Woodland Avenue is controlled by a stop sign. Each approach carries one lane of traffic as well as shared lane markings, "sharrows", to encourage multiple modes of transportation.

The intersection of Atlantic Street at Walter Wheeler Drive is an unsignalized "T" style intersection. Northbound and southbound traffic moves freely on Atlantic Street while westbound traffic from

Walter Wheeler Drive is controlled by a stop sign. Atlantic Street southbound and Walter Wheeler Drive carry one lane of traffic, while Atlantic Street northbound carries one through lane and one right turn lane between Washington Blvd and Walter Wheeler Drive. Each of these approaches also carry shared lane markings, “sharrows”, to encourage multiple modes of transportation.

2.4 Existing Traffic Volumes

The greatest potential for traffic impact on the roadway network by the proposed development will occur during the morning and afternoon peak hours, the periods when commuter and/or high-rise apartment related trips are at their highest levels. These peak hours were subsequently analyzed for impacts. In order to determine the traffic impact of the proposed development on adjacent street traffic, the CTDOT approved 2016 morning and afternoon weekday peak hour turning movement volumes for Stamford’s South End were obtained from the CTDOT Planning Bureau.

3 Background Traffic Conditions

3.1 CTDOT Approved Volumes

Fuss & O’Neill contacted the Connecticut Department of Transportation (CTDOT) Bureau of Planning and the City of Stamford Transportation, Traffic, & Parking Department to obtain an approved set of traffic volumes for the south end of the City of Stamford from 2016 and 2018. These volumes incorporate various roadway projects and developments in the area that are either proposed or being constructed. These volumes were balanced and used as a base for analyzing the impact of the proposed development on the study intersections. These approved volumes will be considered the Existing 2018 morning and afternoon peak hour traffic volumes, and are shown in *Figure No. 2 of Appendix B*.

3.2 Planned Roadway Improvements

Fuss & O’Neill contacted CTDOT as well as the City of Stamford’s Transportation, Traffic & Parking Office in order to determine if any planned roadway improvements to the study network were to take place prior to the proposed build year of 2019. While several roadway improvements are ongoing in the vicinity of Interstate 95 in Stamford, no roadway improvement projects were identified that will impact traffic patterns at any of the study area intersections for this development.

4 Proposed Conditions

4.1 Development and Parking

The proposed development will consist of one high-rise building with 540 residential units comprised of a mix of studio, one-, two-, and three-bedroom units. The development will be bounded by Woodland Avenue to the north, Pacific Street to the east, Walter Wheeler Drive to the south, and South Commons Road to the west. A total of 675 parking spaces are proposed to be provided.

4.2 Site Access and Circulation

The site is proposed to have access provided to residents via two full access driveways that will lead to the parking garage on the interior of the building. Additionally, there will be two loading docks that will access Woodland Avenue and Walter Wheeler Drive, respectively. All four of these driveways are proposed to be stop controlled.

4.3 Trip Generation

The expected site generated traffic data was calculated using existing empirical data from the Institute of Transportation Engineers (ITE) publication Trip Generation, 10th edition, 2017. This publication is an industry-accepted resource for determining trip generation.

Trip generation for the proposed development was estimated based on the proposed number of dwelling units. Using TE Code 222 – Multifamily Housing (High Rise).

Based on the ITE average rates for this land use, the proposed development would generate a total of 168 trips (40 entering, 128 exiting) during the morning peak hour and 195 trips (119 entering, 76 exiting) during the afternoon peak hour.

The proposed site is less than three-quarters of a mile from the Stamford Transportation Center (STC), therefore reducing vehicular trip demand at this site. As such, a transit oriented development (TOD) credit is also applicable to the trip generation for this site. In collaboration with the CTDOT Bureau of Policy and Planning, a rate of 30% is being used for the TOD credit.

After taking the aforementioned credits into account, the proposed development is projected to generate a total of 118 trips (28 entering, 90 exiting) during the morning peak hour and 137 trips (84 entering, 53 exiting) during the afternoon peak hour. A summary of the peak hour trip generation information for the proposed development is provided in *Table 1 of Appendix A*.

4.4 Trip Distribution

The distribution of traffic entering and exiting the proposed site was applied to the road network based on the existing regional traffic distributions and the layout of the adjacent roadway network. During the peak hours, the following arrival/departure distributions of traffic are anticipated:

- 50% from Pacific Street to the north
- 30% from Atlantic Street to the north
- 15% from Pacific Street to the south
- 5% from Atlantic Street to the south

A regional arrival/departure distribution for the new site generated traffic traveling to and from the project site is shown in *Figure No. 4 of Appendix B*.

4.5 Combined Volumes

The site generated traffic was distributed to the roadway system based on the arrival/departure distributions with the results shown in *Figure No. 5 of Appendix B*. These volumes were then added to the background volumes to yield the year 2018 peak hour Combined traffic volumes shown in *Figure No. 6 of Appendix B*.

5 Analyses

5.1 Crash Data Analysis

Crash data was gathered from University of Connecticut Crash Data Repository for the following intersections:

- Pacific Street at Walter Wheeler Drive/East Walnut Street
- Pacific Street at Woodland Avenue/Ludlow Street
- Atlantic Street at Woodland Avenue
- Woodland Avenue
- Pacific Street from Walter Wheeler Drive to Woodland Avenue
- Atlantic Street at Walter Wheeler Drive

The records were gathered for the most recent three years of available data, 2015 through 2017. A summary of the crash data per intersection and roadway segment is provided in *Table 2 of Appendix A*. Copies of the crash data have been provided in *Appendix E*.

At the intersection of Pacific Street and Walter Wheeler Drive/East Walnut Street, there were two reported crashes during the three year study period. One of the crashes was reported to be an angle crash, and the other was a rear-end collision.

At the intersection of Pacific Street and Woodland Avenue/Ludlow Street, there were six reported crashes during the three year study period. The crashes included two same-direction sideswiping collisions, two rear-end collisions, one angle collision, and one collision between a vehicle and a pedestrian.

At the intersection of Atlantic Street and Woodland Avenue, there was one crash reported during the three year period, which was a rear-end collision.

Along Woodland Avenue, there were four crashes reported during the three year study period. The crashes included two rear-end collisions, one angle collision, and one opposite-direction sideswiping collision.

Along Pacific Street from Walter Wheeler Drive to Woodland Avenue, there were two reported crashes during the three year study period. One of the crashes was a same-direction sideswiping collision and the other was a rear end collision.

At the intersection of Atlantic Street at Walter Wheeler Drive, there were three reported crashes during the three year study period. Two of the three crashes were angle collisions, while one was a single vehicle colliding with a fence.

All of the crashes described above resulted in property damage only. The crash between the vehicles and pedestrian at the intersection of Pacific Street and Woodland Avenue is listed to have a possible injury but none were ever officially reported. Therefore, the type, frequency, and severity of the crashes reported are not abnormal for the type of roadways, volume of traffic and current land use in the study area.

5.2 Intersection Sight Distance Analysis

Intersection sight distances were evaluated at the proposed site driveway locations in accordance with criteria set forth in the 2003 CTDOT *Highway Design Manual*.

All site driveways have been designed to have an unobstructed sightline beyond the nearest intersection in either direction. The sight distances will exceed CTDOT criteria for safe egress.

5.3 Intersection Capacity Analysis

Capacity analyses for both signalized and unsignalized intersections were conducted using Synchro Professional Software, version 10.0.

In discussing intersection capacity analyses results, two terms are used to describe the operating condition of the road or intersection. These two terms are volume to capacity ratio (v/c) and level of service (LOS).

The v/c ratio is a ratio of the volume of traffic using an intersection to the total capacity of the intersection (the maximum number of vehicles that can utilize the intersection during an hour). The v/c ratio can be used to describe the percentage of capacity utilized by a single intersection movement, a combination of movements, an entire intersection approach, or the intersection as a whole.

LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 50 seconds per vehicle for unsignalized intersections and 80 seconds per vehicle for signalized intersections. Delay is described as a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

LOS is generally used to describe the operation (based on delay time) of both signalized and unsignalized intersections, while v/c ratio is applied to signalized intersections only. These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized and unsignalized intersection capacity analyses, are taken from the "2000 Highway Capacity Manual" published by the Transportation Research Board.

In discussing two way stop controlled unsignalized intersection capacity analyses, LOS is used to provide a description of the delay and operational characteristics of the turns from the minor street (stop sign controlled) to the major street, and turns from the major street to the minor street. Through vehicles are not delayed by the minor street and do not experience delay, therefore they are not rated with a level of service.

In discussed all-way stop controlled intersection capacity analysis, LOS provides a description of the delay for each approach as well as the overall intersection.

Using the above referenced methodologies, morning and afternoon peak hour capacity analyses were conducted at the following signalized intersection:

- Pacific Street at Woodland Avenue/Ludlow Street

Morning and afternoon peak hour capacity analyses were also conducted at the following unsignalized intersections:

- Atlantic Street at Woodland Avenue
- Atlantic Street at Walter Wheeler Drive
- Commons Park S at West Driveway
- Pacific Street at East Driveway
- Commons Park S at Woodland Avenue
- Pacific Street at Walter Wheeler Drive/E Walnut Street

Tables No. 3 and 4 of *Appendix A* present a summary of the levels of service at the unsignalized and signalized intersections for both the background and combined condition traffic volumes; copies of the analysis worksheets can be found in *Appendices C and D*, for the morning and afternoon peak hours, respectively.

The determination of the traffic impact from the proposed development is made through a comparison of the background conditions LOS (without the proposed development) versus the combined conditions LOS (with the proposed development).

The capacity analysis revealed that all study intersections and the proposed site driveways will operate efficiently at LOS B or better during both the morning and afternoon peak hours of traffic in the combined condition, with the exception of the northbound movement at the intersection of Pacific Street at the east site driveway. This movement will operate at an acceptable LOS C, with adequate bypass width for cars to move around any queuing vehicles waiting to turn left into the proposed development.

Based on the conducted capacity analysis, the proposed roadway configuration is adequately suited to handle the added demand of the traffic generated by this development.

6 Conclusions & Recommendations

The purpose of preparing this Traffic Impact Study is to identify the impact of the proposed Woodland Pacific Development site generated traffic on its surrounding roadway network. The study efforts have indicated that the proposed residential use will generate a total of 118 trips (28 entering, 90 exiting) during the morning peak hour and 137 trips (84 entering, 53 exiting) during the afternoon peak hour, factoring in a 30 percent trip generation credit due to the development's proximity to transit. The site's close proximity to the Stamford Transportation Center (STC) will serve to reduce the overall site generated traffic from this development.

The capacity analysis indicates that the additional traffic generated by the proposed development and associated roadway improvements will result in no significant change in level of service at any of the intersections in the vicinity of the site. Additionally, each of the unsignalized intersections in the study area, including all three site driveways, will operate acceptably at LOS C or better in both the morning and afternoon peak hours, with the majority of critical movements operating at LOS A or LOS B.

A review of intersection sight distance revealed that each of the proposed driveway locations meets the CTDOT requirements for sight distance and they have been designed to provide full view beyond the nearest adjacent intersections.

A review of crash data history for the previous three years of available data yielded the conclusion that there were no identifiable crash patterns under the current roadway configuration.

Based on the results of the foregoing analysis, it is the professional opinion of Fuss & O'Neill, Inc. that the proposed development will not have a significant impact to traffic operations within the study area.

Appendix A

Tables



Table 1

Peak Hour Site Generated Traffic Volumes
Woodland Pacific Development
Stamford, Connecticut

LUC 222: Multifamily Housing (High-Rise)	Morning Peak Hour			Afternoon Peak Hour		
	Entering	Exiting	Total	Entering	Exiting	Total
Total Trips	40	128	168	119	76	195
30% TOD Credit	-12	-38	-50	-35	-23	-58
Total New Site Generated Trips	28	90	118	84	53	137

Note: Trip generation based on Rate per Land use Codes 222 (Multifamily Housing (High-Rise)) *Trip Generation*, 10th Edition, 2017. Volumes reflect 30% reduction from transit and TOD credits.



Table 2
Intersection Crash Data Summary
Woodland Pacific Development
Stamford, Connecticut

Intersections/Road Segments	Crashes Per Year			
	2015	2016	2017	Average/Year
Pacific Street at Walter Wheeler Drive/East Walnut Street	0*	2	0	0.67
Pacific Street at Woodland Avenue/Ludlow Street	5	1	0	2
Atlantic Street at Woodland Avenue	0	1	0	0.33
Woodland Avenue	2	2	0	1.33
Pacific Street from Walter Wheeler Drive to Woodland Avenue	2	0	0	0.67
Atlantic Street at Walter Wheeler Drive	0	1	2	1

*Values indicated are number of crashes within 200 feet of each intersection during time period shown.
 Data provided by the Connecticut Department of Transportation



Table 3

**Unsignalized Intersection Level of Service Summary
Woodland Pacific Development
Stamford, Connecticut**

Two-Way Stop Controlled Intersections (Critical Movements)	2019 AM Peak Hour		2019 PM Peak Hour	
	Background	Combined	Background	Combined
Atlantic Street at Woodland Avenue				
WB Approach	LOS B*	LOS B	LOS B	LOS C
SB Left Turn	LOS A	LOS A	LOS A	LOS A
Atlantic Street at Walter Wheeler Drive				
WB Approach	LOS A	LOS A	LOS B	LOS B
SW Approach	LOS A	LOS A	LOS A	LOS A
Commons Park S at West Driveway				
WB Approach	N/A	LOS A	N/A	LOS A
SB Approach	N/A	LOS A	N/A	LOS A
Pacific Street at East Driveway				
EB Left Turn	N/A	LOS B	N/A	LOS C
NB Approach	N/A	LOS A	N/A	LOS A



Table 3 (continued)

**Unsignalized Intersection Level of Service Summary
Woodland Pacific Development
Stamford, Connecticut**

Two-Way Stop Controlled Intersections (Critical Movements)	2018 AM Peak Hour		2018 PM Peak Hour	
	Background	Combined	Background	Combined
Commons Park S at Woodland Avenue				
WB Approach	LOS A	LOS A	LOS A	LOS A
NB Approach	LOS A	LOS A	LOS A	LOS A
All Way Stop Controlled Intersections				
Pacific Street at Walter Wheeler Drive/East Walnut Street				
EB Approach	LOS A	LOS A	LOS A	LOS B
WB Approach	LOS A	LOS A	LOS A	LOS A
NB Approach	LOS B	LOS B	LOS B	LOS B
SB Approach	LOS B	LOS B	LOS B	LOS B

*Values indicated are critical movement Level of Service (LOS)





Table 4

**Signalized Intersection Level of Service Summary
Woodland Pacific Development
Stamford, Connecticut**

Signalized Intersections	2018 AM Peak Hour		2018 PM Peak Hour	
	Background	Combined	Background	Combined
Pacific Street at Woodland Avenue/Ludlow Street	0.42/LOS A*	0.46/LOS A	0.60/LOS B	0.65/LOS C

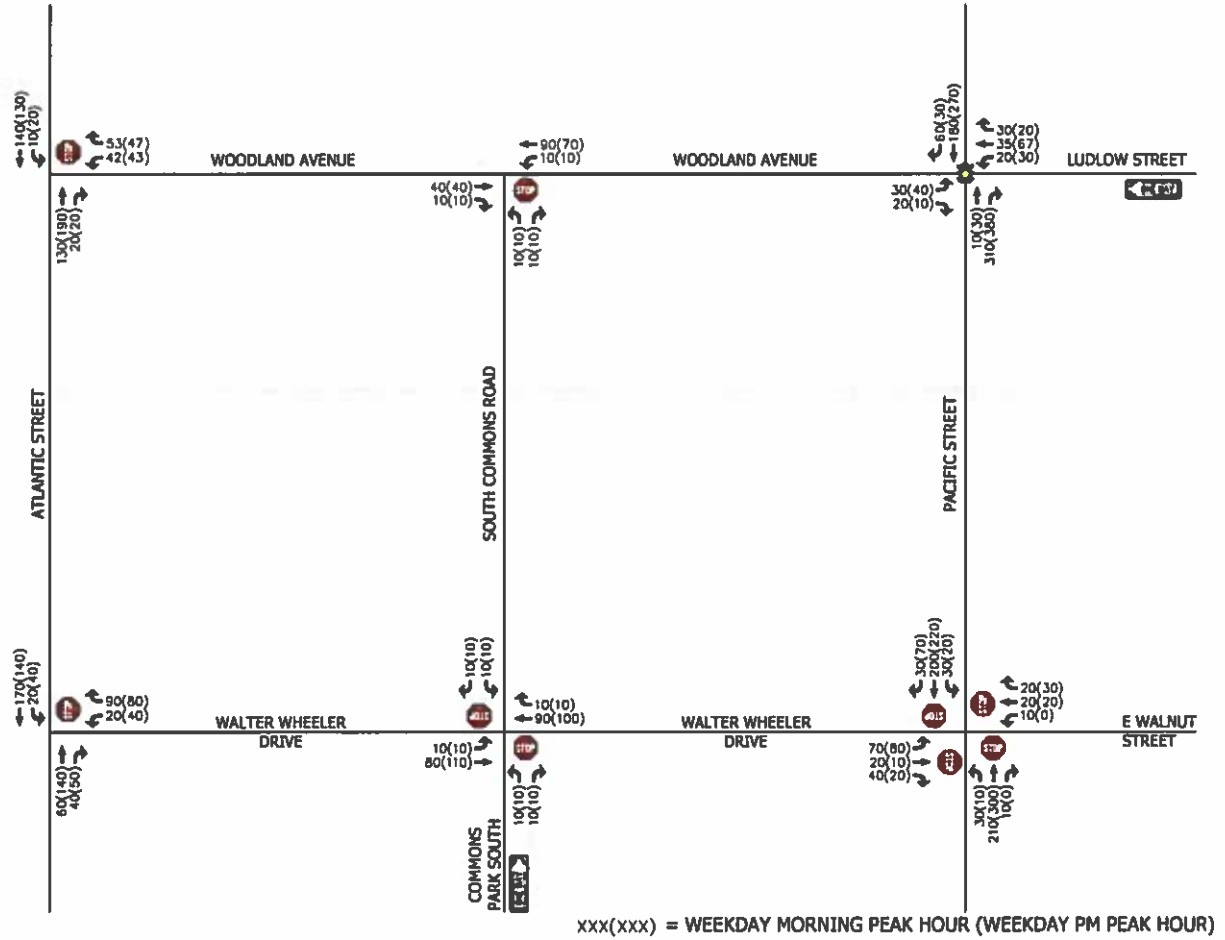
*Values indicated are intersection v/c Ratio/LOS



Appendix B

Figures





xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)

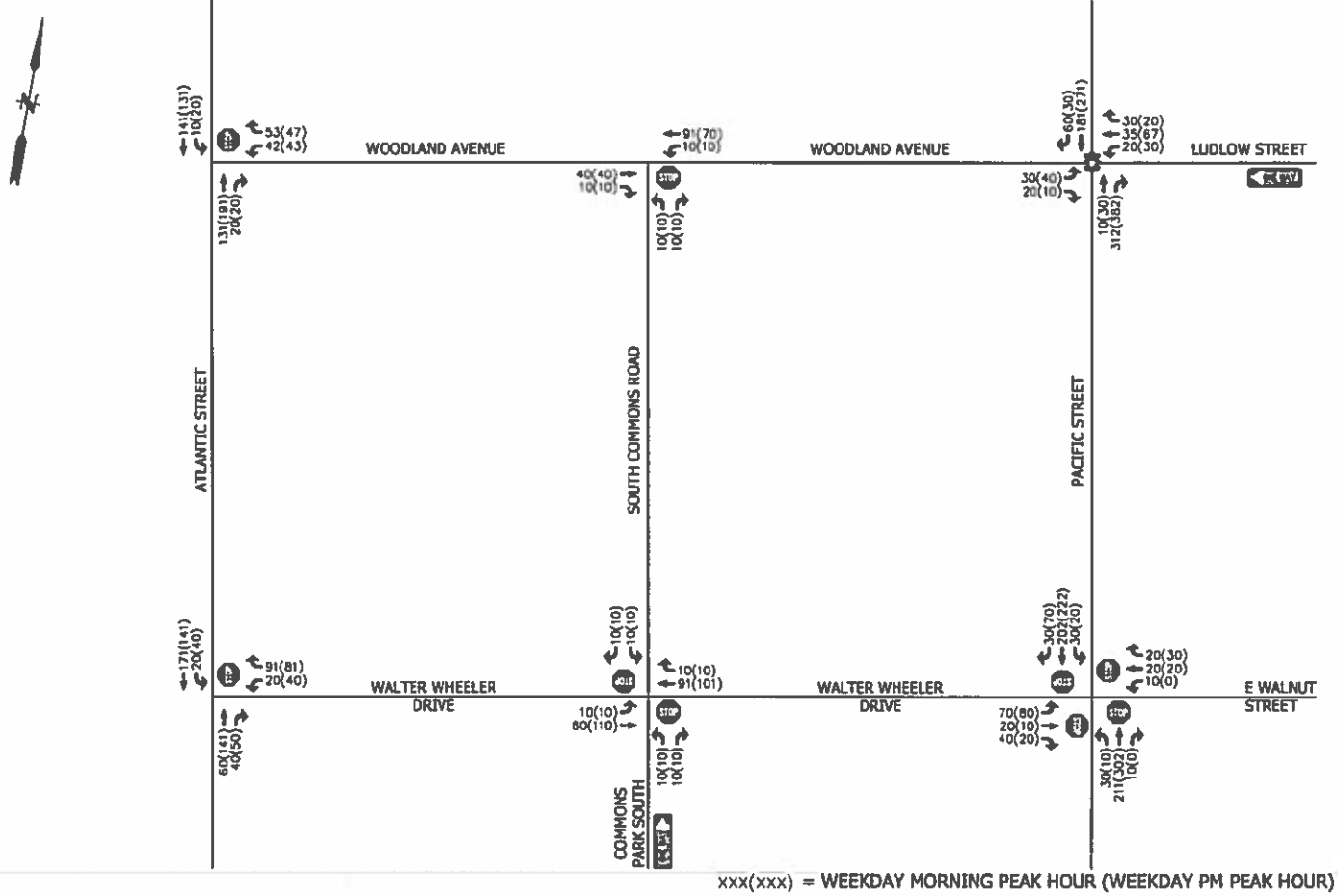
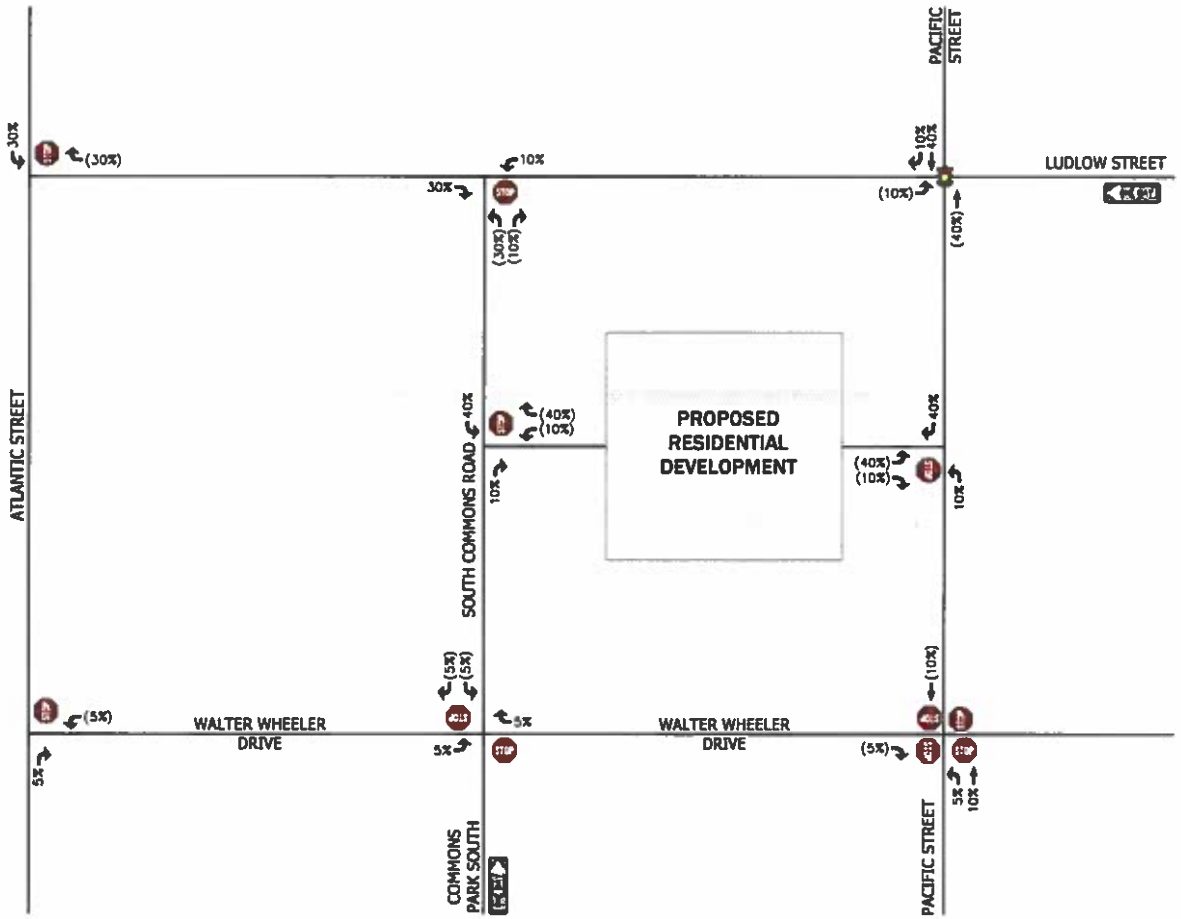


FIGURE 3: 2019 BACKGROUND TRAFFIC CONDITIONS

PROJ. NO. 20060679.720

WOODLAND PACIFIC DEVELOPMENT

AUGUST 3, 2018



xxx(xxx) = ENTERING TRAFFIC (EXITING TRAFFIC)



FUSS & O'NEILL

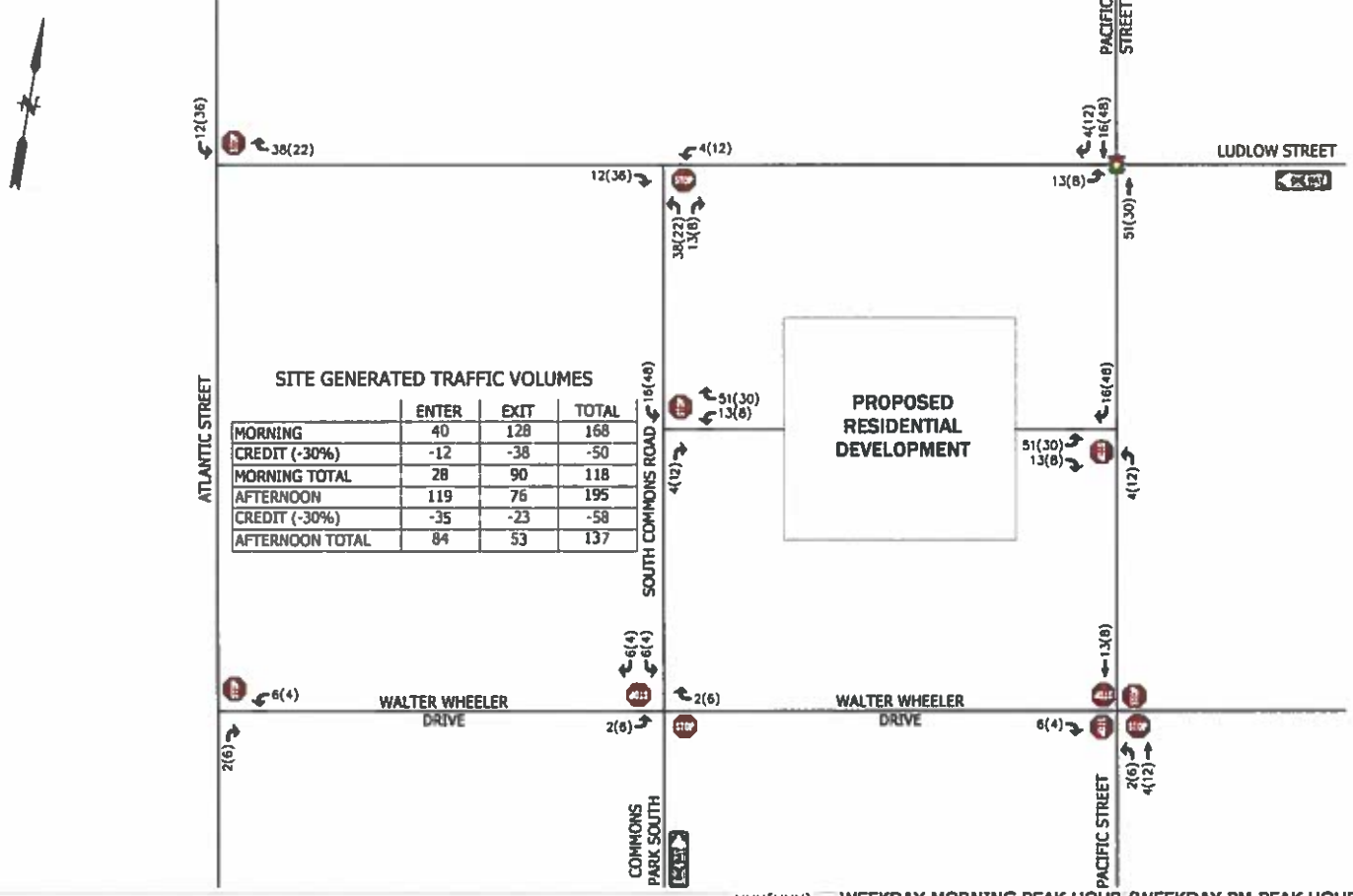
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860-646-3400
www.fandob.com

FIGURE 4: SITE GENERATED TRAFFIC ARRIVAL/DEPARTURE DISTRIBUTION

PROJ. NO. 20080719.120

WOODLAND PACIFIC DEVELOPMENT

AUGUST 3, 2018



xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)

FIGURE 5: SITE GENERATED TRAFFIC VOLUMES

Appendix C

Intersection Capacity Analysis Worksheets
2019 Background Traffic Volumes
AM Peak Hour



Lanes, Volumes, Timings
1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Volume (vph)	30	0	20	20	35	30	10	312	0	0	181	60
Future Volume (vph)	30	0	20	20	35	30	10	312	0	0	181	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946			0.930						0.967	
Flt Protected		0.971		0.950				0.998				
Satd. Flow (prot)	0	1711	0	1770	1732	0	0	1859	0	0	1801	0
Flt Permitted		0.775		0.755				0.988				
Satd. Flow (perm)	0	1366	0	1406	1732	0	0	1840	0	0	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			33						29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			219			225			372	
Travel Time (s)		8.5			5.0			5.1			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	22	22	38	33	11	339	0	0	197	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	22	71	0	0	350	0	0	262	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2					
Detector Phase	4	4		4	4		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0			10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0			23.5	
Total Split (s)	36.0	36.0		36.0	36.0		69.0	69.0			69.0	
Total Split (%)	34.3%	34.3%		34.3%	34.3%		65.7%	65.7%			65.7%	
Maximum Green (s)	31.0	31.0		31.0	31.0		64.0	64.0			64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	None	None		None	None		Min	Min			Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		6.4		6.4	6.4			17.5			17.5	
Actuated g/C Ratio		0.21		0.21	0.21			0.57			0.57	
v/c Ratio		0.18		0.08	0.18			0.34			0.25	
Control Delay		8.2		9.7	7.3			6.6			5.5	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		8.2		9.7	7.3			6.6			5.5	
LOS		A		A	A			A			A	
Approach Delay		8.2		7.9	7.9			6.6			5.5	
Approach LOS		A		A	A			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 30.9

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 6.5

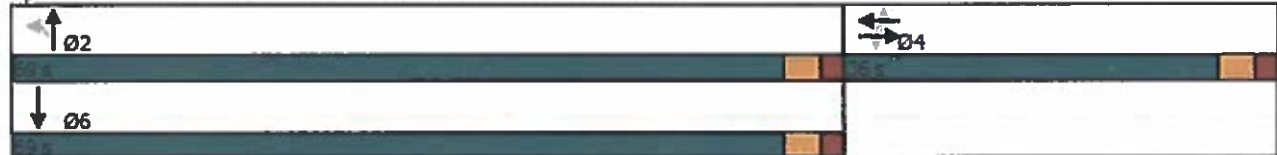
Intersection LOS: A

Intersection Capacity Utilization 42.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Pacific Street & Woodland Avenue/Ludlow Street



HCM 6th Edition methodology does not support Non-NEMA phasing.

Lanes, Volumes, Timings
2: Atlantic Street & Woodland Avenue

Woodland Pacific Development
AM Background



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	42	53	131	20	10	141
Future Volume (vph)	42	53	131	20	10	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.925		0.982			
Flt Protected	0.978					0.997
Satd. Flow (prot)	1685	0	1829	0	0	1857
Flt Permitted	0.978					0.997
Satd. Flow (perm)	1685	0	1829	0	0	1857
Link Speed (mph)	30		30			
Link Distance (ft)	373		591			
Travel Time (s)	8.5		13.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	58	142	22	11	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	164	0	0	164
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection

Int Delay, s/veh 2.7

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	↘		↗			↖
Traffic Vol, veh/h	42	53	131	20	10	141
Future Vol, veh/h	42	53	131	20	10	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	58	142	22	11	153

Major/Minor	Minor1	Major1	Major2	Major3	Major4
Conflicting Flow All	328	153	0	0	164
Stage 1	153	-	-	-	-
Stage 2	175	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	666	893	-	-	1414
Stage 1	875	-	-	-	-
Stage 2	855	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	660	893	-	-	1414
Mov Cap-2 Maneuver	660	-	-	-	-
Stage 1	867	-	-	-	-
Stage 2	855	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	10.4	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	772	1414
HCM Lane V/C Ratio	-	-	0.134	0.008
HCM Control Delay (s)	-	-	10.4	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0

Lanes, Volumes, Timings
 3: Pacific Street & Walter Wheeler Drive

Woodland Pacific Development
 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	70	20	40	10	20	20	30	211	10	30	202	30
Future Volume (vph)	70	20	40	10	20	20	30	211	10	30	202	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.946			0.995			0.984	
Flt Protected		0.974			0.990			0.994			0.994	
Satd. Flow (prot)	0	1740	0	0	1745	0	0	1842	0	0	1822	0
Flt Permitted		0.974			0.990			0.994			0.994	
Satd. Flow (perm)	0	1740	0	0	1745	0	0	1842	0	0	1822	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		342			214			212			353	
Travel Time (s)		7.8			4.9			4.8			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	22	43	11	22	22	33	229	11	33	220	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	141	0	0	55	0	0	273	0	0	286	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	70	20	40	10	20	20	30	211	10	30	202	30
Future Vol, veh/h	70	20	40	10	20	20	30	211	10	30	202	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	22	43	11	22	22	33	229	11	33	220	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.7	8.8	10.6	10.6
HCM LOS	A	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	54%	20%	11%
Vol Thru, %	84%	15%	40%	77%
Vol Right, %	4%	31%	40%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	251	130	50	262
LT Vol	30	70	10	30
Through Vol	211	20	20	202
RT Vol	10	40	20	30
Lane Flow Rate	273	141	54	285
Geometry Grp	1	1	1	1
Degree of Util (X)	0.362	0.205	0.079	0.373
Departure Headway (Hd)	4.776	5.222	5.245	4.72
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	748	681	674	758
Service Time	2.842	3.305	3.342	2.785
HCM Lane V/C Ratio	0.365	0.207	0.08	0.376
HCM Control Delay	10.6	9.7	8.8	10.6
HCM Lane LOS	B	A	A	B
HCM 95th-ile Q	1.7	0.8	0.3	1.7

Lanes, Volumes, Timings
4: Atlantic Street & Walter Wheeler Drive

Woodland Pacific Development
AM Background



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	20	91	60	40	20	171
Future Volume (vph)	20	91	60	40	20	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.890		0.946			
Flt Protected	0.991					0.995
Satd. Flow (prot)	1643	0	1762	0	0	1853
Flt Permitted	0.991					0.995
Satd. Flow (perm)	1643	0	1762	0	0	1853
Link Speed (mph)	30		30			30
Link Distance (ft)	626		219			591
Travel Time (s)	14.2		5.0			13.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	99	65	43	22	186
Shared Lane Traffic (%)						
Lane Group Flow (vph)	121	0	108	0	0	208
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 30.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		P			4
Traffic Vol, veh/h	20	91	60	40	20	171
Future Vol, veh/h	20	91	60	40	20	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	99	65	43	22	186

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	317	87	0	0	108
Stage 1	87	-	-	-	-
Stage 2	230	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	676	971	-	-	1483
Stage 1	936	-	-	-	-
Stage 2	808	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	665	971	-	-	1483
Mov Cap-2 Maneuver	665	-	-	-	-
Stage 1	920	-	-	-	-
Stage 2	808	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	9.6	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	897	1483
HCM Lane V/C Ratio	-	-	0.135	0.015
HCM Control Delay (s)	-	-	9.6	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0

Lanes, Volumes, Timings
7: Commons Park S & Woodland Avenue

Woodland Pacific Development
AM Background

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↘	
Traffic Volume (vph)	40	10	10	91	10	10
Future Volume (vph)	40	10	10	91	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.972				0.932	
Flt Protected				0.995	0.976	
Satd. Flow (prot)	1811	0	0	1853	1694	0
Flt Permitted				0.995	0.976	
Satd. Flow (perm)	1811	0	0	1853	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	373			375	270	
Travel Time (s)	8.5			8.5	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	11	11	99	11	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	54	0	0	110	22	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T			T	T	
Traffic Vol, veh/h	40	10	10	91	10	10
Future Vol, veh/h	40	10	10	91	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	11	11	99	11	11

















Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	54	0	170
Stage 1	-	-	-	-	49
Stage 2	-	-	-	-	121
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1551	-	820
Stage 1	-	-	-	-	973
Stage 2	-	-	-	-	904
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1551	-	813
Mov Cap-2 Maneuver	-	-	-	-	813
Stage 1	-	-	-	-	965
Stage 2	-	-	-	-	904

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	905	-	-	1551	-
HCM Lane V/C Ratio	0.024	-	-	0.007	-
HCM Control Delay (s)	9.1	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lanes, Volumes, Timings
 8: Commons Park S & Walter Wheeler Drive

Woodland Pacific Development
 AM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	80	0	0	90	10	10	0	10	10	0	10
Future Volume (vph)	10	80	0	0	90	10	10	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.986			0.932			0.932	
Flt Protected		0.994						0.976			0.976	
Satd. Flow (prot)	0	1852	0	0	1837	0	0	1694	0	0	1694	0
Flt Permitted		0.994						0.976			0.976	
Satd. Flow (perm)	0	1852	0	0	1837	0	0	1694	0	0	1694	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		626			342			263			304	
Travel Time (s)		14.2			7.8			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	87	0	0	98	11	11	0	11	11	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	109	0	0	22	0	0	22	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.4%

ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		←			→			↔			↔	
Traffic Vol, veh/h	10	80	0	0	90	10	10	0	10	10	0	10
Future Vol, veh/h	10	80	0	0	90	10	10	0	10	10	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	87	0	0	98	11	11	0	11	11	0	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.6	7.3	7.3
HCM LOS	A	A	A	A













Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	11%	0%	50%
Vol Thru, %	0%	89%	90%	0%
Vol Right, %	50%	0%	10%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	90	100	20
LT Vol	10	10	0	10
Through Vol	0	80	90	0
RT Vol	10	0	10	10
Lane Flow Rate	22	98	109	22
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.112	0.121	0.025
Departure Headway (Hd)	4.106	4.113	4.022	4.106
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	868	887	857
Service Time	2.204	2.157	2.067	2.204
HCM Lane V/C Ratio	0.026	0.113	0.123	0.026
HCM Control Delay	7.3	7.7	7.6	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.4	0.1

Appendix C

Intersection Capacity Analysis Worksheets
2019 Combined Traffic Volumes
AM Peak Hour

Lanes, Volumes, Timings
1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
AM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Volume (vph)	43	0	20	20	35	30	10	363	0	0	197	64
Future Volume (vph)	43	0	20	20	35	30	10	363	0	0	197	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr t		0.957			0.930						0.967	
Flt Protected		0.967		0.950				0.999				
Satd. Flow (prot)	0	1724	0	1770	1732	0	0	1861	0	0	1801	0
Flt Permitted		0.752		0.714				0.989				
Satd. Flow (perm)	0	1341	0	1330	1732	0	0	1842	0	0	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			33						29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			219			225			372	
Travel Time (s)		8.5			5.0			5.1			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	22	22	38	33	11	395	0	0	214	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	22	71	0	0	406	0	0	284	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2					
Detector Phase	4	4		4	4		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0			10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0			23.5	
Total Split (s)	36.0	36.0		36.0	36.0		69.0	69.0			69.0	
Total Split (%)	34.3%	34.3%		34.3%	34.3%		65.7%	65.7%			65.7%	
Maximum Green (s)	31.0	31.0		31.0	31.0		64.0	64.0			64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	None	None		None	None		Min	Min			Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		6.8		6.8	6.8			18.1			18.1	
Actuated g/C Ratio		0.21		0.21	0.21			0.57			0.57	
v/c Ratio		0.23		0.08	0.18			0.39			0.27	
Control Delay		9.7		10.4	7.8			7.1			5.7	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		9.7		10.4	7.8			7.1			5.7	
LOS		A		B	A			A			A	
Approach Delay		9.7			8.4			7.1			5.7	
Approach LOS		A			A			A			A	

Lanes, Volumes, Timings
 1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
 AM Combined

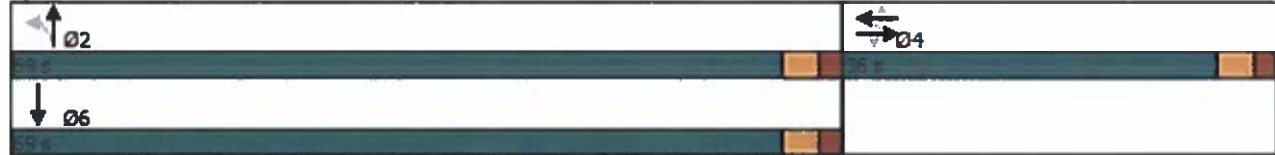


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		5		2	4			38			22	
Queue Length 95th (ft)		26		13	24			88			55	
Internal Link Dist (ft)		295			139			145			292	
Turn Bay Length (ft)												
Base Capacity (vph)		1279		1267	1652			1842			1801	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.05		0.02	0.04			0.22			0.16	

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 31.7
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 7.0
 Intersection Capacity Utilization 45.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Pacific Street & Woodland Avenue/Ludlow Street



HCM 6th Edition methodology does not support Non-NEMA phasing.

Lanes, Volumes, Timings
 2: Atlantic Street & Woodland Avenue

Woodland Pacific Development
 AM Combined



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		P			4
Traffic Volume (vph)	42	91	131	20	22	141
Future Volume (vph)	42	91	131	20	22	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.908		0.982			
Flt Protected	0.984					0.993
Satd. Flow (prot)	1664	0	1829	0	0	1850
Flt Permitted	0.984					0.993
Satd. Flow (perm)	1664	0	1829	0	0	1850
Link Speed (mph)	30		30			30
Link Distance (ft)	373		591			176
Travel Time (s)	8.5		13.4			4.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	99	142	22	24	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	145	0	164	0	0	177
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.7%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	42	91	131	20	22	141
Future Vol, veh/h	42	91	131	20	22	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	99	142	22	24	153













Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	354	153	0	0	164
Stage 1	153	-	-	-	-
Stage 2	201	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	644	893	-	-	1414
Stage 1	875	-	-	-	-
Stage 2	833	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	632	893	-	-	1414
Mov Cap-2 Maneuver	632	-	-	-	-
Stage 1	858	-	-	-	-
Stage 2	833	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	10.6	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NERWBLn1	SWL	SWT
Capacity (veh/h)	-	-	790	1414
HCM Lane V/C Ratio	-	-	0.183	0.017
HCM Control Delay (s)	-	-	10.6	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1

Lanes, Volumes, Timings
 3: Pacific Street & Walter Wheeler Drive

Woodland Pacific Development
 AM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	70	20	46	10	20	20	32	215	10	30	215	30
Future Volume (vph)	70	20	46	10	20	20	32	215	10	30	215	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Friction		0.954			0.946			0.995			0.985	
Flt Protected		0.975			0.990			0.994			0.995	
Satd. Flow (prot)	0	1733	0	0	1745	0	0	1842	0	0	1826	0
Flt Permitted		0.975			0.990			0.994			0.995	
Satd. Flow (perm)	0	1733	0	0	1745	0	0	1842	0	0	1826	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		342			214			212			353	
Travel Time (s)		7.8			4.9			4.8			8.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	22	50	11	22	22	35	234	11	33	234	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	55	0	0	280	0	0	300	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	70	20	46	10	20	20	32	215	10	30	215	30
Future Vol, veh/h	70	20	46	10	20	20	32	215	10	30	215	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	22	50	11	22	22	35	234	11	33	234	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.8	8.9	10.8	10.9
HCM LOS	A	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	51%	20%	11%
Vol Thru, %	84%	15%	40%	78%
Vol Right, %	4%	34%	40%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	257	136	50	275
LT Vol	32	70	10	30
Through Vol	215	20	20	215
RT Vol	10	46	20	30
Lane Flow Rate	279	148	54	299
Geometry Grp	1	1	1	1
Degree of Util (X)	0.374	0.216	0.082	0.395
Departure Headway (Hd)	4.817	5.251	5.42	4.752
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	740	676	665	750
Service Time	2.895	3.346	3.42	2.829
HCM Lane V/C Ratio	0.377	0.219	0.081	0.399
HCM Control Delay	10.8	9.8	8.9	10.9
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	1.7	0.8	0.3	1.9

Lanes, Volumes, Timings
 4: Atlantic Street & Walter Wheeler Drive

Woodland Pacific Development
 AM Combined



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	T		T			T
Traffic Volume (vph)	26	91	60	42	20	171
Future Volume (vph)	26	91	60	42	20	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895		0.944			
Flt Protected	0.989					0.995
Satd. Flow (prot)	1649	0	1758	0	0	1853
Flt Permitted	0.989					0.995
Satd. Flow (perm)	1649	0	1758	0	0	1853
Link Speed (mph)	30		30			30
Link Distance (ft)	626		219			591
Travel Time (s)	14.2		5.0			13.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	99	65	46	22	186
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	0	111	0	0	208
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection

Int Delay, s/veh 3.2

Movement WBL WBR NET NER SWL SWT

Lane Configurations	Y		T			T
Traffic Vol, veh/h	26	91	60	42	20	171
Future Vol, veh/h	26	91	60	42	20	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	99	65	46	22	186

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	318	88	0	0	111	0
Stage 1	88	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	675	970	-	-	1479	-
Stage 1	935	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	664	970	-	-	1479	-
Mov Cap-2 Maneuver	664	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach WB NE SW

HCM Control Delay, s	9.8	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt NET NERWBLn1 SWL SWT

Capacity (veh/h)	-	-	880	1479	-
HCM Lane V/C Ratio	-	-	0.145	0.015	-
HCM Control Delay (s)	-	-	9.8	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Lanes, Volumes, Timings
5: Commons Park S & West Driveway

Woodland Pacific Development
AM Combined



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P			←
Traffic Volume (vph)	13	51	10	4	16	10
Future Volume (vph)	13	51	10	4	16	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892		0.964			
Flt Protected	0.990					0.971
Satd. Flow (prot)	1645	0	1796	0	0	1809
Flt Permitted	0.990					0.971
Satd. Flow (perm)	1645	0	1796	0	0	1809
Link Speed (mph)	30		30			30
Link Distance (ft)	161		304			270
Travel Time (s)	3.7		6.9			6.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	55	11	4	17	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	15	0	0	28
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	6.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	13	51	10	4	16	10
Future Vol, veh/h	13	51	10	4	16	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	55	11	4	17	11

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	58	13	0	0	15
Stage 1	13	-	-	-	-
Stage 2	45	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	949	1067	-	-	1603
Stage 1	1010	-	-	-	-
Stage 2	977	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	939	1067	-	-	1603
Mov Cap-2 Maneuver	939	-	-	-	-
Stage 1	999	-	-	-	-
Stage 2	977	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	4.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1038	1603
HCM Lane V/C Ratio	-	-	0.067	0.011
HCM Control Delay (s)	-	-	8.7	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Lanes, Volumes, Timings
6: Pacific Street & East Driveway

Woodland Pacific Development
AM Combined



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↵			↕	↕	
Traffic Volume (vph)	51	13	4	301	221	16
Future Volume (vph)	51	13	4	301	221	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.991	
Flt Protected	0.962			0.999		
Satd. Flow (prot)	1744	0	0	1861	1846	0
Flt Permitted	0.962			0.999		
Satd. Flow (perm)	1744	0	0	1861	1846	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	135			353	225	
Travel Time (s)	3.1			8.0	5.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	14	4	327	240	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	0	331	257	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	51	13	4	301	221	16
Future Vol, veh/h	51	13	4	301	221	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	14	4	327	240	17

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	584	249	257	0	-	0
Stage 1	249	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	474	790	1308	-	-	-
Stage 1	792	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	472	790	1308	-	-	-
Mov Cap-2 Maneuver	472	-	-	-	-	-
Stage 1	789	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1308	-	514	-	-
HCM Lane V/C Ratio	0.003	-	0.135	-	-
HCM Control Delay (s)	7.8	0	13.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Lanes, Volumes, Timings
7: Commons Park S & Woodland Avenue

Woodland Pacific Development
AM Combined

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Traffic Volume (vph)	40	22	14	91	48	23
Future Volume (vph)	40	22	14	91	48	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952				0.956	
Flt Protected			0.993		0.967	
Satd. Flow (prot)	1773	0	0	1850	1722	0
Flt Permitted			0.993		0.967	
Satd. Flow (perm)	1773	0	0	1850	1722	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	373			375	270	
Travel Time (s)	8.5			8.5	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	24	15	99	52	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	0	114	77	0
Sign Control	Free		Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	3.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	40	22	14	91	48	23
Future Vol, veh/h	40	22	14	91	48	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	24	15	99	52	25

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	67	0	184
Stage 1	-	-	-	-	55
Stage 2	-	-	-	-	129
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1535	-	805
Stage 1	-	-	-	-	968
Stage 2	-	-	-	-	897
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1535	-	797
Mov Cap-2 Maneuver	-	-	-	-	797
Stage 1	-	-	-	-	958
Stage 2	-	-	-	-	897

Approach	EB	WB	NB
HCM Control Delay, s	0	1	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	856	-	-	1535	-
HCM Lane V/C Ratio	0.09	-	-	0.01	-
HCM Control Delay (s)	9.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Lanes, Volumes, Timings
8: Commons Park S & Walter Wheeler Drive

Woodland Pacific Development
AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	80	0	0	91	12	10	0	10	16	0	16
Future Volume (vph)	12	80	0	0	91	12	10	0	10	16	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.984			0.932			0.932	
Flt Protected		0.994						0.976			0.976	
Satd. Flow (prot)	0	1852	0	0	1833	0	0	1694	0	0	1694	0
Flt Permitted		0.994						0.976			0.976	
Satd. Flow (perm)	0	1852	0	0	1833	0	0	1694	0	0	1694	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		626			342			263			304	
Travel Time (s)		14.2			7.8			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	87	0	0	99	13	11	0	11	17	0	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	112	0	0	22	0	0	34	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.5%

ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↔			↕			↕	
Traffic Vol, veh/h	12	80	0	0	91	12	10	0	10	16	0	16
Future Vol, veh/h	12	80	0	0	91	12	10	0	10	16	0	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	87	0	0	99	13	11	0	11	17	0	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.7	7.3	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	13%	0%	50%
Vol Thru, %	0%	87%	88%	0%
Vol Right, %	50%	0%	12%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	92	103	32
LT Vol	10	12	0	16
Through Vol	0	80	91	0
RT Vol	10	0	12	16
Lane Flow Rate	22	100	112	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.115	0.126	0.041
Departure Headway (Hd)	4.234	4.143	4.038	4.219
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	850	859	881	854
Service Time	2.235	2.199	2.094	2.22
HCM Lane V/C Ratio	0.026	0.116	0.127	0.041
HCM Control Delay	7.3	7.7	7.7	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.4	0.1

Appendix D

Intersection Capacity Analysis Worksheets
2019 Background Traffic Volumes
PM Peak Hour



Lanes, Volumes, Timings
1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	10	30	67	20	30	382	0	0	271	30
Future Volume (vph)	40	0	10	30	67	20	30	382	0	0	271	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.972			0.965							0.986
Flt Protected		0.962		0.950				0.996				
Satd. Flow (prot)	0	1742	0	1770	1798	0	0	1855	0	0	1837	0
Flt Permitted		0.706		0.722				0.960				
Satd. Flow (perm)	0	1278	0	1345	1798	0	0	1788	0	0	1837	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			13							9
Link Speed (mph)		30			30			30				30
Link Distance (ft)		395			219			190				372
Travel Time (s)		9.0			5.0			4.3				8.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	0	11	33	73	22	33	415	0	0	295	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	33	95	0	0	448	0	0	328	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			4			2				6
Permitted Phases	4			4			2					
Detector Phase	4	4		4	4		2	2				6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0				10.0
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0				23.5
Total Split (s)	39.0	39.0		39.0	39.0		76.0	76.0				76.0
Total Split (%)	33.9%	33.9%		33.9%	33.9%		66.1%	66.1%				66.1%
Maximum Green (s)	34.0	34.0		34.0	34.0		71.0	71.0				71.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0				2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		5.0		5.0	5.0			5.0				5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0
Recall Mode	None	None		None	None		Min	Min				Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0				7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0				11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0				0
Act Effct Green (s)		7.3		7.3	7.3			19.1				19.1
Actuated g/C Ratio		0.22		0.22	0.22			0.58				0.58
v/c Ratio		0.18		0.11	0.23			0.43				0.31
Control Delay		9.9		11.8	11.4			7.6				6.3
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		9.9		11.8	11.4			7.6				6.3
LOS		A		B	B			A				A
Approach Delay		9.9			11.5			7.6				6.3
Approach LOS		A			B			A				A

Lanes, Volumes, Timings
 1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
 PM Background



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		4		4	10			46			30	
Queue Length 95th (ft)		24		20	39			107			72	
Internal Link Dist (ft)		315			139			110			292	
Turn Bay Length (ft)												
Base Capacity (vph)		1246		1311	1753			1788			1837	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.04		0.03	0.05			0.25			0.18	

Intersection Summary

Area Type: Other

Cycle Length: 115

Actuated Cycle Length: 33

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 7.8

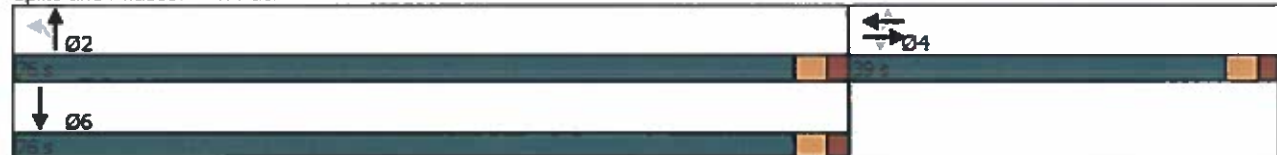
Intersection LOS: A

Intersection Capacity Utilization 59.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Pacific Street & Woodland Avenue/Ludlow Street



HCM 6th Edition methodology does not support Non-NEMA phasing.

Lanes, Volumes, Timings
2: Atlantic Street & Woodland Avenue



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	43	47	191	20	20	131
Future Volume (vph)	43	47	191	20	20	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.930		0.987			
Fl _t Protected	0.977					0.993
Satd. Flow (prot)	1693	0	1839	0	0	1850
Fl _t Permitted	0.977					0.993
Satd. Flow (perm)	1693	0	1839	0	0	1850
Link Speed (mph)	30		30			30
Link Distance (ft)	352		590			176
Travel Time (s)	8.0		13.4			4.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	51	208	22	22	142
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	0	230	0	0	164
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.5%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		P			4
Traffic Vol, veh/h	43	47	191	20	20	131
Future Vol, veh/h	43	47	191	20	20	131
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	51	208	22	22	142

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	405	219	0	0	230
Stage 1	219	-	-	-	-
Stage 2	186	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	602	821	-	-	1338
Stage 1	817	-	-	-	-
Stage 2	846	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	591	821	-	-	1338
Mov Cap-2 Maneuver	591	-	-	-	-
Stage 1	802	-	-	-	-
Stage 2	846	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	11.1	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBL1	SWL	SWT
Capacity (veh/h)	-	-	692	1338	-
HCM Lane V/C Ratio	-	-	0.141	0.016	-
HCM Control Delay (s)	-	-	11.1	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Lanes, Volumes, Timings
 3: Pacific Street & Walter Wheeler Drive

Woodland Pacific Development
 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	80	10	20	0	20	30	10	302	0	20	222	70
Future Volume (vph)	80	10	20	0	20	30	10	302	0	20	222	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.919						0.970	
Flt Protected		0.965						0.998			0.997	
Satd. Flow (prot)	0	1753	0	0	1712	0	0	1859	0	0	1801	0
Flt Permitted		0.965						0.998			0.997	
Satd. Flow (perm)	0	1753	0	0	1712	0	0	1859	0	0	1801	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		342			214			212			388	
Travel Time (s)		7.8			4.9			4.8			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	11	22	0	22	33	11	328	0	22	241	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	120	0	0	55	0	0	339	0	0	339	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 44.4%

ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	80	10	20	0	20	30	10	302	0	20	222	70
Future Vol, veh/h	80	10	20	0	20	30	10	302	0	20	222	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	11	22	0	22	33	11	328	0	22	241	76
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10	8.9	11.9	11.5
HCM LOS	A	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	73%	0%	6%
Vol Thru, %	97%	9%	40%	71%
Vol Right, %	0%	18%	60%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	312	110	50	312
LT Vol	10	80	0	20
Through Vol	302	10	20	222
RT Vol	0	20	30	70
Lane Flow Rate	339	120	54	339
Geometry Grp	1	1	1	1
Degree of Util (X)	0.452	0.189	0.082	0.441
Departure Headway (Hd)	4.803	5.697	5.444	4.685
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	743	634	661	760
Service Time	2.887	3.7	3.448	2.768
HCM Lane V/C Ratio	0.456	0.189	0.082	0.446
HCM Control Delay	11.9	10	8.9	11.5
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	2.4	0.7	0.3	2.3

Lanes, Volumes, Timings
 4: Atlantic Street & Walter Wheeler Drive

Woodland Pacific Development
 PM Background



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		T			T
Traffic Volume (vph)	40	81	141	50	40	141
Future Volume (vph)	40	81	141	50	40	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.909		0.965			
Flt Protected	0.984					0.989
Satd. Flow (prot)	1666	0	1798	0	0	1842
Flt Permitted	0.984					0.989
Satd. Flow (perm)	1666	0	1798	0	0	1842
Link Speed (mph)	30		30			30
Link Distance (ft)	632		224			590
Travel Time (s)	14.4		5.1			13.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	88	153	54	43	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	131	0	207	0	0	196
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 37.3% ICU Level of Service A
 Analysis Period (min) 15

Intersection

Int Delay, s/veh 3.3

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	40	81	141	50	40	141
Future Vol, veh/h	40	81	141	50	40	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	88	153	54	43	153

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	419	180	0
Stage 1	180	-	-
Stage 2	239	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	591	863	-
Stage 1	851	-	-
Stage 2	801	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	571	863	-
Mov Cap-2 Maneuver	571	-	-
Stage 1	822	-	-
Stage 2	801	-	-

Approach	WB	NE	SW
HCM Control Delay, s	10.9	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	738	1364	-
HCM Lane V/C Ratio	-	-	0.178	0.032	-
HCM Control Delay (s)	-	-	10.9	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Lanes, Volumes, Timings
7: Commons Park South & Woodland Avenue

Woodland Pacific Development
PM Background

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	40	10	10	70	10	10
Future Volume (vph)	40	10	10	70	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.972				0.932	
Flt Protected				0.994	0.976	
Satd. Flow (prot)	1811	0	0	1852	1694	0
Flt Permitted				0.994	0.976	
Satd. Flow (perm)	1811	0	0	1852	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	352			395	229	
Travel Time (s)	8.0			9.0	5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	11	11	76	11	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	54	0	0	87	22	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.9%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←			↑	↘	↙
Traffic Vol, veh/h	40	10	10	70	10	10
Future Vol, veh/h	40	10	10	70	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	11	11	76	11	11













Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	54	0	147
Stage 1	-	-	-	-	49
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1551	-	845
Stage 1	-	-	-	-	973
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1551	-	839
Mov Cap-2 Maneuver	-	-	-	-	839
Stage 1	-	-	-	-	966
Stage 2	-	-	-	-	926

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	921	-	-	1551	-
HCM Lane V/C Ratio	0.024	-	-	0.007	-
HCM Control Delay (s)	9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lanes, Volumes, Timings
 8: Commons Park South & Walter Wheeler Drive

Woodland Pacific Development
 PM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Traffic Volume (vph)	10	110	0	0	101	10	10	0	10	10	0	10
Future Volume (vph)	10	110	0	0	101	10	10	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.988			0.932			0.932	
Flt Protected		0.996						0.976			0.976	
Satd. Flow (prot)	0	1855	0	0	1840	0	0	1694	0	0	1694	0
Flt Permitted		0.996						0.976			0.976	
Satd. Flow (perm)	0	1855	0	0	1840	0	0	1694	0	0	1694	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		632			342			263			355	
Travel Time (s)		14.4			7.8			6.0			8.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	120	0	0	110	11	11	0	11	11	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	131	0	0	121	0	0	22	0	0	22	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 23.0%

ICU Level of Service A

Analysis Period (min) 15

HCM 6th AWSC
8: Commons Park South & Walter Wheeler Drive

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↕			↕	
Traffic Vol, veh/h	10	110	0	0	101	10	10	0	10	10	0	10
Future Vol, veh/h	10	110	0	0	101	10	10	0	10	10	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	120	0	0	110	11	11	0	11	11	0	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.8	7.4	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	8%	0%	50%
Vol Thru, %	0%	92%	91%	0%
Vol Right, %	50%	0%	9%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	120	111	20
LT Vol	10	10	0	10
Through Vol	0	110	101	0
RT Vol	10	0	10	10
Lane Flow Rate	22	130	121	22
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.149	0.136	0.026
Departure Headway (Hd)	4.302	4.116	4.053	4.302
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	837	866	878	837
Service Time	2.303	2.169	2.109	2.303
HCM Lane V/C Ratio	0.026	0.15	0.138	0.026
HCM Control Delay	7.4	7.9	7.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5	0.1













Appendix D

Intersection Capacity Analysis Worksheets
2019 Combined Traffic Volumes
PM Peak Hour



Lanes, Volumes, Timings
1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
PM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		↔		↵	↶			↕			↷	
Traffic Volume (vph)	48	0	10	30	67	20	30	412	0	0	319	42
Future Volume (vph)	48	0	10	30	67	20	30	412	0	0	319	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.965							0.984
Flt Protected		0.960		0.950				0.997				
Satd. Flow (prot)	0	1745	0	1770	1798	0	0	1857	0	0	1833	0
Flt Permitted		0.699		0.716				0.958				
Satd. Flow (perm)	0	1271	0	1334	1798	0	0	1785	0	0	1833	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			13							11
Link Speed (mph)		30			30			30				30
Link Distance (ft)		395			219			190				372
Travel Time (s)		9.0			5.0			4.3				8.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	0	11	33	73	22	33	448	0	0	347	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	33	95	0	0	481	0	0	393	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			4			2				6
Permitted Phases	4			4			2					
Detector Phase	4	4		4	4		2	2				6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0				10.0
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0				23.5
Total Split (s)	39.0	39.0		39.0	39.0		76.0	76.0				76.0
Total Split (%)	33.9%	33.9%		33.9%	33.9%		66.1%	66.1%				66.1%
Maximum Green (s)	34.0	34.0		34.0	34.0		71.0	71.0				71.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0				2.0
Lost Time Adjust (s)		0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)		5.0		5.0	5.0			5.0				5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0
Recall Mode	None	None		None	None		Min	Min				Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0				7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0				11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0				0
Act Effct Green (s)		7.4		7.4	7.4			19.9				19.9
Actuated g/C Ratio		0.22		0.22	0.22			0.59				0.59
v/c Ratio		0.22		0.11	0.24			0.46				0.36
Control Delay		11.2		12.6	12.1			7.8				6.6
Queue Delay		0.0		0.0	0.0			0.0				0.0
Total Delay		11.2		12.6	12.1			7.8				6.6
LOS		B		B	B			A				A
Approach Delay		11.2			12.2			7.8				6.6
Approach LOS		B			B			A				A

Lanes, Volumes, Timings
 1: Pacific Street & Woodland Avenue/Ludlow Street

Woodland Pacific Development
 PM Combined

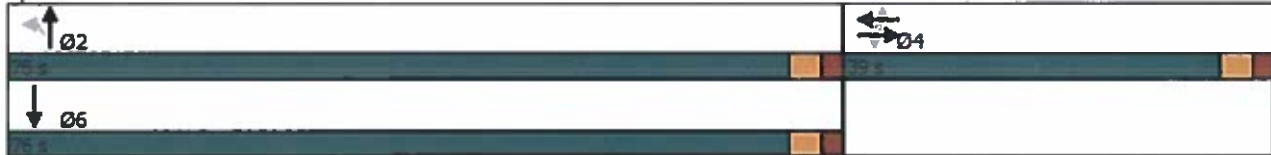
Queue Length 50th (ft)		6		4	11			51			38	
Queue Length 95th (ft)		30		21	42			119			88	
Internal Link Dist (ft)		315			139			110			292	
Turn Bay Length (ft)												
Base Capacity (vph)		1219		1279	1724			1785			1833	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.05		0.03	0.06			0.27			0.21	

Intersection Summary

Area Type: Other
 Cycle Length: 115
 Actuated Cycle Length: 33.9
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 8.1
 Intersection Capacity Utilization 64.6%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Pacific Street & Woodland Avenue/Ludlow Street



HCM 6th Edition methodology does not support Non-NEMA phasing.

Lanes, Volumes, Timings
2: Atlantic Street & Woodland Avenue

Woodland Pacific Development
PM Combined



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	↔		→			↔
Traffic Volume (vph)	43	69	191	20	56	131
Future Volume (vph)	43	69	191	20	56	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.917		0.987			
Flt Protected	0.981					0.985
Satd. Flow (prot)	1676	0	1839	0	0	1835
Flt Permitted	0.981					0.985
Satd. Flow (perm)	1676	0	1839	0	0	1835
Link Speed (mph)	30		30			30
Link Distance (ft)	352		590			176
Travel Time (s)	8.0		13.4			4.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	75	208	22	61	142
Shared Lane Traffic (%)						
Lane Group Flow (vph)	122	0	230	0	0	203
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		P			4
Traffic Vol, veh/h	43	69	191	20	56	131
Future Vol, veh/h	43	69	191	20	56	131
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	75	208	22	61	142













Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	483	219	0	0	230
Stage 1	219	-	-	-	-
Stage 2	264	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	542	821	-	-	1338
Stage 1	817	-	-	-	-
Stage 2	780	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	515	821	-	-	1338
Mov Cap-2 Maneuver	515	-	-	-	-
Stage 1	776	-	-	-	-
Stage 2	780	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s	11.6	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	669	1338	-
HCM Lane V/C Ratio	-	-	0.182	0.045	-
HCM Control Delay (s)	-	-	11.6	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Lanes, Volumes, Timings
3: Pacific Street & Walter Wheeler Drive

Woodland Pacific Development
PM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	80	10	24	0	20	30	16	314	0	20	230	70
Future Volume (vph)	80	10	24	0	20	30	16	314	0	20	230	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.972			0.919						0.971	
Flt Protected		0.966						0.998			0.997	
Satd. Flow (prot)	0	1749	0	0	1712	0	0	1859	0	0	1803	0
Flt Permitted		0.966						0.998			0.997	
Satd. Flow (perm)	0	1749	0	0	1712	0	0	1859	0	0	1803	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		342			214			212			388	
Travel Time (s)		7.8			4.9			4.8			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	11	26	0	22	33	17	341	0	22	250	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	0	55	0	0	358	0	0	348	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	80	10	24	0	20	30	16	314	0	20	230	70
Future Vol, veh/h	80	10	24	0	20	30	16	314	0	20	230	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	11	26	0	22	33	17	341	0	22	250	76
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.2	9.1	12.4	11.8
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	70%	0%	6%
Vol Thru, %	95%	9%	40%	72%
Vol Right, %	0%	21%	60%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	114	50	320
LT Vol	16	80	0	20
Through Vol	314	10	20	230
RT Vol	0	24	30	70
Lane Flow Rate	359	124	54	348
Geometry Grp	1	1	1	1
Degree of Util (X)	0.482	0.198	0.084	0.457
Departure Headway (Hd)	4.834	5.756	5.538	4.728
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	735	627	650	751
Service Time	2.929	3.759	3.544	2.824
HCM Lane V/C Ratio	0.488	0.198	0.083	0.463
HCM Control Delay	12.4	10.2	9.1	11.8
HCM Lane LOS	B	B	A	B
HCM 95th-ile Q	2.6	0.7	0.3	2.4

Lanes, Volumes, Timings
 4: Atlantic Street & Walter Wheeler Drive

Woodland Pacific Development
 PM Combined



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	44	81	141	56	40	141
Future Volume (vph)	44	81	141	56	40	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.913		0.962			
Flt Protected	0.983					0.989
Satd. Flow (prot)	1672	0	1792	0	0	1842
Flt Permitted	0.983					0.989
Satd. Flow (perm)	1672	0	1792	0	0	1842
Link Speed (mph)	30		30			30
Link Distance (ft)	632		224			590
Travel Time (s)	14.4		5.1			13.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	88	153	61	43	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	0	214	0	0	196
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection

Int Delay, s/veh 3.4

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	44	81	141	56	40	141
Future Vol, veh/h	44	81	141	56	40	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	88	153	61	43	153

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	423	184	0 0 214 0
Stage 1	184	-	- - - -
Stage 2	239	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	588	858	- - 1356 -
Stage 1	848	-	- - - -
Stage 2	801	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	567	858	- - 1356 -
Mov Cap-2 Maneuver	567	-	- - - -
Stage 1	818	-	- - - -
Stage 2	801	-	- - - -

Approach	WB	NE	SW
HCM Control Delay, s	11.1	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	727	1356	-
HCM Lane V/C Ratio	-	-	0.187	0.032	-
HCM Control Delay (s)	-	-	11.1	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Lanes, Volumes, Timings
5: Commons Park South & West Driveway

Woodland Pacific Development
PM Combined

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↗			↓
Traffic Volume (vph)	8	30	10	12	48	10
Future Volume (vph)	8	30	10	12	48	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.894		0.927			
Flt Protected	0.989					0.960
Satd. Flow (prot)	1647	0	1727	0	0	1788
Flt Permitted	0.989					0.960
Satd. Flow (perm)	1647	0	1727	0	0	1788
Link Speed (mph)	30		30			30
Link Distance (ft)	150		355			229
Travel Time (s)	3.4		8.1			5.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	33	11	13	52	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	24	0	0	63
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 19.9%

ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	5.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P			Y
Traffic Vol, veh/h	8	30	10	12	48	10
Future Vol, veh/h	8	30	10	12	48	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	33	11	13	52	11

Major/Minor	Minor1	Major1	Major2	Major3	Major4
Conflicting Flow All	133	18	0	0	24
Stage 1	18	-	-	-	-
Stage 2	115	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	861	1061	-	-	1591
Stage 1	1005	-	-	-	-
Stage 2	910	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	833	1061	-	-	1591
Mov Cap-2 Maneuver	833	-	-	-	-
Stage 1	972	-	-	-	-
Stage 2	910	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	6.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1003	1591
HCM Lane V/C Ratio	-	-	0.041	0.033
HCM Control Delay (s)	-	-	8.7	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

Lanes, Volumes, Timings
6: Pacific Street & East Driveway

Woodland Pacific Development
PM Combined



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Volume (vph)	30	8	12	412	311	48
Future Volume (vph)	30	8	12	412	311	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.971				0.982	
Flt Protected	0.962			0.999		
Satd. Flow (prot)	1740	0	0	1861	1829	0
Flt Permitted	0.962			0.999		
Satd. Flow (perm)	1740	0	0	1861	1829	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	120			388	190	
Travel Time (s)	2.7			8.8	4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	9	13	448	338	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	0	461	390	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			A	B	
Traffic Vol, veh/h	30	8	12	412	311	48
Future Vol, veh/h	30	8	12	412	311	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	9	13	448	338	52

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	838	364	390	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	336	681	1169	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	331	681	1169	-	-	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	626	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.9	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1169	-	371	-	-
HCM Lane V/C Ratio	0.011	-	0.111	-	-
HCM Control Delay (s)	8.1	0	15.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lanes, Volumes, Timings
7: Commons Park South & Woodland Avenue

Woodland Pacific Development
PM Combined

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	40	46	22	70	32	18
Future Volume (vph)	40	46	22	70	32	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.927				0.951	
Flt Protected				0.988	0.969	
Satd. Flow (prot)	1727	0	0	1840	1717	0
Flt Permitted				0.988	0.969	
Satd. Flow (perm)	1727	0	0	1840	1717	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	352			395	229	
Travel Time (s)	8.0			9.0	5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	50	24	76	35	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	93	0	0	100	55	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.6%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T			T	T	
Traffic Vol, veh/h	40	46	22	70	32	18
Future Vol, veh/h	40	46	22	70	32	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	50	24	76	35	20

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	93	0	192
Stage 1	-	-	-	-	68
Stage 2	-	-	-	-	124
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1501	-	797
Stage 1	-	-	-	-	955
Stage 2	-	-	-	-	902
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1501	-	783
Mov Cap-2 Maneuver	-	-	-	-	783
Stage 1	-	-	-	-	939
Stage 2	-	-	-	-	902

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	848	-	-	1501	-
HCM Lane V/C Ratio	0.064	-	-	0.016	-
HCM Control Delay (s)	9.5	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lanes, Volumes, Timings
8: Commons Park South & Walter Wheeler Drive

Woodland Pacific Development
PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	110	0	0	101	16	10	0	10	14	0	14
Future Volume (vph)	16	110	0	0	101	16	10	0	10	14	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.982			0.932			0.932	
Flt Protected		0.994						0.976			0.976	
Satd. Flow (prot)	0	1852	0	0	1829	0	0	1694	0	0	1694	0
Flt Permitted		0.994						0.976			0.976	
Satd. Flow (perm)	0	1852	0	0	1829	0	0	1694	0	0	1694	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		632			342			263			355	
Travel Time (s)		14.4			7.8			6.0			8.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	120	0	0	110	17	11	0	11	15	0	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	137	0	0	127	0	0	22	0	0	30	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↔			↕			↕	
Traffic Vol, veh/h	16	110	0	0	101	16	10	0	10	14	0	14
Future Vol, veh/h	16	110	0	0	101	16	10	0	10	14	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	120	0	0	110	17	11	0	11	15	0	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.8	7.5	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	13%	0%	50%
Vol Thru, %	0%	87%	86%	0%
Vol Right, %	50%	0%	14%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	126	117	28
LT Vol	10	16	0	14
Through Vol	0	110	101	0
RT Vol	10	0	16	14
Lane Flow Rate	22	137	127	30
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.158	0.143	0.037
Departure Headway (Hd)	4.343	4.146	4.046	4.332
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	859	877	831
Service Time	2.344	2.205	2.111	2.333
HCM Lane V/C Ratio	0.027	0.159	0.145	0.036
HCM Control Delay	7.5	8	7.8	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.6	0.5	0.1

Appendix E

Crash Data Records



UConn Crash Data

Project Name
 Stamford, Connecticut
 2015 - 2016

Date Of Crash	Time Of Crash	Severity	No. of Veh.	No. of Ped.	Town	Mileage	Roadway	Intersecting Roadway	Collision Type	Weather	Light Condition	Road Surface Condition	Contributing Circumstances
1/11/2015	20:58:00	Property Damage Only	2	0	Stamford	0.17	PACIFIC STREET		Front to rear	Clear	Dark Lighted	Dry	None
8/3/2015	17:58:00	Property Damage Only	2	0	Stamford	0.04	34 WOODLAND AVENUE		Side-swipe, opposite direction	Clear	Daylight	Dry	None
5/16/2015	15:47:00	Property Damage Only	2	0	Stamford	0.56	PACIFIC STREET		Side-swipe, same direction	Clear	Daylight	Dry	None
3/5/2015	17:05:00	Property Damage Only	2	0	Stamford	0.18	Woodland Ave	Pacific Street	Side-swipe, same direction	Clear	Daylight	Dry	None
4/24/2015	14:57:00	Property Damage Only	2	0	Stamford	0.12	WOODLAND AVE NUF	Unknown	Front to rear	Cloudy	Daylight	Dry	None
5/13/2015	11:50:00	Property Damage Only	2	0	Stamford	0.17	PACIFIC ST	WOODLAND AV	Front to rear	Clear	Daylight	Dry	None
1/11/2016	14:16:00	Property Damage Only	2	0	Stamford	0.26	PACIFIC ST	WALTER WHEELER DRIVE	Angle	Clear	Daylight	Dry	Weather Conditions
2/5/2016	21:33:00	Property Damage Only	2	0	Stamford	0.26	Pacific St	WALTER WHEELER DRIVE	Front to rear	Snow	Dark Lighted	Ice / Frost	None
5/21/2016	16:59:00	Property Damage Only	2	0	Stamford	0.79	ATLANTIC ST	WOODLAND AV	Front to rear	Clear	Daylight	Dry	None
4/12/2016	21:58:00	Property Damage Only	2	0	Stamford	0.18	WOODLAND AVE	Pacific Street	Angle	Clear	Dark Lighted	Dry	None
12/7/2015	21:06:00	Possible Injury	1	1	Stamford	0.8	PACIFIC ST	WOODLAND PL (PVT)	Not Applicable	Rain	Dark Lighted	Wet	Weather Conditions
9/3/2015	16:31:00	Property Damage Only	2	0	Stamford	0.17	704 PACIFIC ST	LUDLOW ST	Side-swipe, same direction	Clear	Daylight	Dry	None
11/4/2016	15:38:00	Property Damage Only	2	0	Stamford	0.08	11 Woodland Ave	Unknown	Angle	Clear	Daylight	Dry	None
12/2/2016	2:47:00	Property Damage Only	3	0	Stamford	0.08	9 WOODLAND AV	Unknown	Front to rear	Clear	Dark Lighted	Dry	None
4/16/2015	13:18:00	Property Damage Only	2	0	Stamford	0.8	Pacific St	WOODLAND PL (PVT)	Front to rear	Clear	Daylight	Dry	None
4/30/2016	21:49:00	Property Damage Only	1	0	Stamford	0.92	12 Walter Wheeler Dr	WALTER WHEELER DRIVE	Not Applicable	Clear	Dark Lighted	Dry	Other
1/19/2017	15:54:00	Property Damage Only	2	0	Stamford	0.92	ATLANTIC ST	WALTER WHEELER DRIVE	Angle	Clear	Daylight	Dry	None
12/31/2017	17:13:00	Property Damage Only	2	0	Stamford	0.92	Adams St	Walter Wheeler Drive	Angle	Cloudy	Dark Lighted	Dry	None