

WINCHESTER AT JEAN NICHOLAS COMMERCIAL RETAIL CENTER TRAFFIC IMPACT ANALYSIS

County of Riverside

September 8, 2020



Traffic Engineering • Transportation Planning • Parking • Noise & Vibration
Air Quality • Global Climate Change • Health Risk Assessment

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County of Riverside

September 8, 2020

prepared by
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EXECUTIVE SUMMARY

The purpose of this Traffic Impact Analysis is to provide an assessment of traffic operations resulting from development of the proposed Winchester at Jean Nicholas Commercial Retail Center and to identify measures necessary to eliminate deficient Levels of Service. This report analyzes traffic impacts for the anticipated project opening in Year 2022.

Although this is a technical report, effort has been made to write the report clearly and concisely. A glossary is provided in Appendix A to assist the reader with technical terms related to transportation engineering.

PROJECT DESCRIPTION

The project site is located at the northwest corner of Winchester Road (SR-79) and Jean Nicholas Road in the unincorporated French Valley community of Riverside County. The currently vacant project site is proposed to be developed with 2,627 square feet of coffee shop with drive-thru and a 16 fueling position super convenience market/gas station. Full access for the project site is proposed on Jean Nicholas Road at Mauna Loa Road with right turns in only access at a driveway on Jean Nicholas Road between Mauna Loa Road and Winchester Road (SR-79). The proposed project is anticipated to be constructed and fully operational by year 2022.

EXISTING CONDITIONS

The study intersections currently operate within acceptable Levels of Service during the peak hours for Existing conditions, except for the following study intersection (see Table 1):

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM peak hour – LOS E)

PROJECT TRIPS

The proposed project is forecast to generate a total of approximately 5,185 daily trips, including 290 trips during the AM peak hour and 218 trips during the PM peak hour (see Table 2).

FORECAST OPERATIONS

Existing Plus Project Conditions: The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions, except for the following study intersection that is forecast to continue operating at Level of Service E during the AM peak hour and deteriorate from Level of Service D to E during the PM peak hour (see Table 4):

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM/PM peak hours – LOS E)

With implementation of Recommendation #1, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Project conditions during the AM and PM peak hours.

Existing Plus Ambient Plus Project Conditions: The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Ambient Plus Project conditions, except for the following study intersection that is forecast to continue operating at Level of Service E during the AM peak hour and deteriorate from Level of Service D to E during the PM peak hour (see Table 5):

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM/PM peak hours – LOS E)

With implementation of Recommendation #1 and improvements funded by adopted development impact fee programs, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Ambient Plus Project conditions during the AM and PM peak hours; no additional improvements are required.

Existing Plus Ambient Plus Project Plus Cumulative Conditions: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Ambient Plus Project Plus Cumulative conditions, except for the following study intersection that is forecast to continue operating at Level of Service E during the AM peak hour and deteriorate from Level of Service D to F during the PM peak hour (see Table 6):

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM/PM peak hours – LOS F)
- Moana Loa Road/Project Driveway at Jean Nicholas Road – #7 (AM/PM peak hours – LOS F)

With implementation of the recommendations described below, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Ambient Plus Project Plus Cumulative conditions during the AM and PM peak hours.

RECOMMENDATIONS

The following recommendation has been identified to address the project Level of Service impact for Existing Plus Project conditions.

Recommendation #1:

Prior to project occupancy, the following improvement shall be implemented:

- Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW) – #4
 - Eastbound: Restripe to provide a second left turn lane.

With implementation of Recommendation #1, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Project conditions during the AM and PM peak hours.

The following recommendations have been identified to address the project's share of cumulative impacts.

Recommendation #2:

The project shall contribute to regional transportation improvements through participation in applicable development impact fee programs, including the County of Riverside Road and Bridge Benefit District (RBBD) and the Western Riverside Council of Governments Transportation Uniform Mitigation Fee (TUMF) programs.

Recommendation #3:

If the northeasterly adjacent property develops with the access easement through the project site, the project shall contribute its fair share of the cost for the following improvements:

- Mauna Loa Road/Project Driveway (NS) at Jean Nicholas Road (EW) – #7
 - Install a traffic signal.
 - Restripe the southbound approach to provide one left turn and one shared left/through/right turn lane.

OTHER RECOMMENDATIONS

To ensure vehicle queues for the southbound approach do not obstruct inbound project trips, the following recommendation is provided:

- Install "Do Not Block" pavement markings and signage at the internal project site intersection created between the primary access driveway and the car wash/gas station drive aisles.

1. INTRODUCTION

This section describes the purpose of this traffic impact analysis, project location, proposed development, and study area. Figure 1 shows the project location map and Figure 2 illustrates the project site plan.

PURPOSE AND OBJECTIVES

The purpose of this Traffic Impact Analysis is to provide an assessment of traffic operations resulting from development of the proposed Winchester at Jean Nicholas Commercial Retail Center and to identify measures necessary to eliminate deficient Levels of Service. This report analyzes traffic impacts for the anticipated project opening in Year 2022.

Although this is a technical report, effort has been made to write the report clearly and concisely. A glossary is provided in Appendix A to assist the reader with technical terms related to transportation engineering.

PROJECT DESCRIPTION

The project site is located at the northwest corner of Winchester Road (SR-79) and Jean Nicholas Road in the unincorporated French Valley community of Riverside County. The currently vacant project site is proposed to be developed with 2,627 square feet of coffee shop with drive-thru and a 16 fueling position super convenience market/gas station. Full access for the project site is proposed on Jean Nicholas Road at Mauna Loa Road with right turns in only access at a driveway on Jean Nicholas Road between Mauna Loa Road and Winchester Road (SR-79). The proposed project is anticipated to be constructed and fully operational by year 2022.

STUDY AREA

The study intersections and general scope of the analysis were determined in coordination with County of Riverside. The County-approved scoping agreement is provided in Appendix B.

The study area consists of the following study intersections within the County of Riverside, Caltrans and City of Murrieta jurisdictions:

Study Intersections ¹	Jurisdiction ²
1. Winchester Road [SR-79] (NS) at Whisper Heights/Pourroy Road (EW)	County/Caltrans
2. Winchester Road [SR-79] (NS) at Jean Nicholas Road/Skyview Road (EW)	County/Caltrans
3. Winchester Road [SR-79] (NS) at Blue Spruce Lane/Algarve Avenue (EW)	County/Caltrans
4. Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW)	County/Caltrans/Murrieta
5. Winchester Road [SR-79] (NS) at Benton Road (EW)	County/Caltrans/Murrieta
6. Leon Road (NS) at Baxter Road/Jean Nicholas Road (EW)	County
7. Mauna Loa Road/Project Driveway (NS) at Jean Nicholas Road (EW)	County
8. Project East Driveway (NS) at Jean Nicholas Road (EW)	County

¹ (NS) = north-south roadway; (EW) = east-west roadway; SR = State Route

² County = County of Riverside; Caltrans = California Department of Transportation; Murrieta = City of Murrieta

ANALYSIS SCENARIOS

The following scenarios are analyzed during typical weekday AM and PM peak hour conditions:

- Existing (Year 2020) Conditions
- Existing Plus Project Conditions
- Existing Plus Ambient (Year 2022) Plus Project Conditions
- Existing Plus Ambient (Year 2022) Plus Project Plus Cumulative Conditions



Legend

Study Intersection

Figure 1
Project Location Map

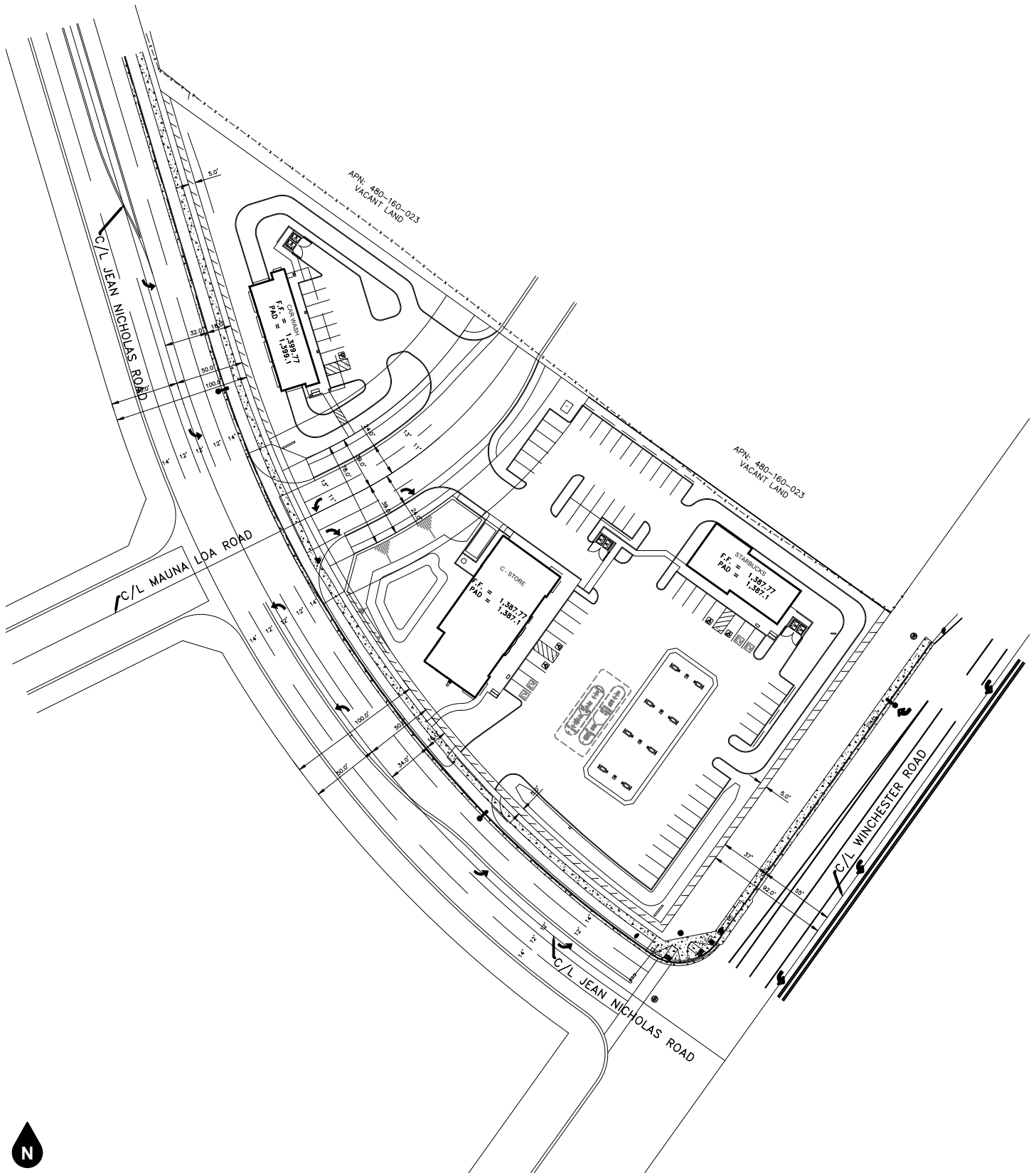


Figure 2
Site Plan

2. METHODOLOGY

This section discusses the analysis methodologies used to assess transportation facility performance as adopted by the respective jurisdictional agencies.

INTERSECTION DELAY METHODOLOGY

To assess the performance of an intersection, the County of Riverside uses the intersection delay method based on procedures contained in the Highway Capacity Manual (Transportation Research Board, 6th Edition). The methodology considers the traffic volume and distribution of movements, traffic composition, geometric characteristics, and signalization details to calculate the average control delay per vehicle and corresponding Level of Service. Control delay is defined as the portion of delay attributed to the intersection traffic control (such as a traffic signal or stop sign) and includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay. The intersection control delay is then correlated to Level of Service based on the following thresholds:

Level of Service	Intersection Control Delay (Seconds / Vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

Source: Transportation Research Board, Highway Capacity Manual (6th Edition).

Level of Service is used to qualitatively describe the performance of a roadway facility, ranging from Level of Service A (free-flow conditions) to Level of Service F (extreme congestion and system failure). At intersections with traffic signal or all way stop control, Level of Service is determined by the average control delay for the overall intersection. At intersections with cross street stop control (i.e., one- or two-way stop control), Level of Service is determined by the average control delay for the worst individual movement (or movements sharing a single lane).

Intersection delay analysis was performed using the Vistro (Version 6.00-03) software in accordance with Exhibit C of the Riverside County Transportation Department Traffic Impact Analysis Preparation Guide (April 2008).

PERFORMANCE STANDARDS

County of Riverside

The definition of an intersection deficiency has been obtained from the County of Riverside General Plan. The General Plan states that Level of Service C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, Palo Verde Valley, and those non-Community Development areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.

Level of Service D shall apply to all development proposals located within any of the following Area Plans: Eastvale, Jurupa, Highgrove, Reche Canyon/Badlands, Lakeview/Nuevo, Sun City/Menifee Valley, Harvest

Valley/Winchester, Southwest Area, The Pass, San Jacinto Valley, Western Coachella Valley and those Community Development Areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.

Level of Service E may be allowed by the Board of Supervisors within designated areas where transit-oriented development and walkable communities are proposed. Notwithstanding the foregoing minimum Level of Service targets, the Board of Supervisors may, on occasion by virtue of their discretionary powers, approve a project that fails to meet these Level of Service targets in order to balance congestion management considerations in relation to benefits, environmental impacts and costs, provided an Environmental Impact Report, or equivalent, has been completed to fully evaluate the impacts of such approval. Any such approval must incorporate all feasible mitigation measures, make specific findings to support the decision, and adopt a statement of overriding considerations.

The project site is located within the Southwest Area Plan; therefore, Level of Service D applies as the minimum acceptable Level of Service.

City of Murrieta

The definition of an intersection deficiency has been obtained from the City of Murrieta General Plan. The General Plan states that the City's Level of Service standards are Level of Service C for roadway segments and Level of Service D for peak hour intersection operations with Level of Service E for freeway interchanges.

California Department of Transportation

As stated in the Guide for the Preparation of Traffic Impact Studies (State of California, 2002), "California Department of Transportation endeavors to maintain a target LOS [Level of Service] at the transition between LOS "C" and LOS "D" on State highway facilities". The California Department of Transportation acknowledges this may not always be feasible and recommends consultation with the California Department of Transportation to determine the appropriate target Level of Service. For consistency with local requirements, this analysis defines Level of Service D as the minimum acceptable Level of Service for State Highway facilities.

RECOMMENDATIONS FOR IMPROVEMENTS

County of Riverside

Based on the established performance standards for County of Riverside, improvements are recommended if:

- The addition of project-generated trips is forecast to cause the performance of a study intersection to deteriorate from acceptable Level of Service (D or better) to unacceptable Level of Service (E or F); or,
- The addition of project generated trips is forecast to worsen the performance of a study intersection operating at unacceptable Level of Service (E or F) in the baseline condition.

City of Murrieta

Based on the established performance standards for City of Murrieta, improvements are recommended if:

- The addition of project-generated trips is forecast to cause the performance of a non-freeway interchange study intersection to deteriorate from acceptable Level of Service D or better to unacceptable Level of Service E or F; or,

- The addition of project-generated trips is forecast to cause the performance of a freeway interchange study intersection to deteriorate from acceptable Level of Service E or better to unacceptable Level of Service F; or,
- The addition of project generated trips is forecast to worsen the performance of an intersection operating at unacceptable Level of Service in the baseline condition.

California Department of Transportation

Based on the established performance standards for County of Riverside, improvements are recommended if:

- The addition of project-generated trips is forecast to cause the performance of a study intersection to deteriorate from acceptable Level of Service (D or better) to unacceptable Level of Service (E or F); or,
- The addition of project generated trips is forecast to worsen the performance of a study intersection operating at unacceptable Level of Service (E or F) in the baseline condition.

Improvements

If a proposed project is forecast to require improvements, recommendations should be identified that will reduce the Level of Service impact. Recommendations can be in many forms, including the addition of lanes, traffic control modification, or demand management measures.

Direct project impacts are identified in the Existing Plus Project analysis scenario and must be addressed via conditions of approval requiring the construction of any improvements necessary to meet the established Level of Service standards (or reduce the project impact to pre-project conditions). Cumulative impacts are identified the cumulative conditions scenario and may be addressed through the payment of various impact mitigation fees such as the County of Riverside Development Impact Fees, Road and Bridge Benefit District Fees, and the Transportation Uniform Mitigation Fees to the extent that these programs provide funding for the improvement facilities.

3. EXISTING CONDITIONS

EXISTING ROADWAY SYSTEM

Figure 3 identifies the lane geometry and intersection traffic controls for Existing conditions based on a field survey of the study area. Regional access to the project site is provided by the I-215 Freeway located approximately 3.55 miles west of the project site, and the I-15 Freeway located approximately 6.8 miles southwest of the project site. Key roadways providing local circulation include Winchester Road (SR-79), Leon Road, Mauna Loa Road, Benton Road, Max Gilliss Boulevard, Thompson Road, Blue Spruce Lane, Algarve Avenue, Baxter Road, Jean Nicholas Road, Skyview Road, Whisper Heights, and Pourroy Road.

GENERAL PLAN CONTEXT

Figure 4 shows the County of Riverside General Plan (Southwest Area) Circulation Element roadway classifications map. This figure shows the nature and extent of arterial and collector highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The County of Riverside standard roadway cross-sections are illustrated on Figure 5.

Figure 6 shows the City of Murrieta General Plan Circulation Element roadway classifications map. This figure shows the nature and extent of arterial and collector highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The City of Murrieta standard roadway cross-sections are illustrated on Figure 7.

TRANSIT SERVICE

Figure 8 shows Existing public transit facilities and routes in the project vicinity. As shown on Figure 8, the project vicinity is served by Riverside Transit Agency Routes 79 and 217 along Winchester Road. There is a transit stop for Route 79 at the intersection of Winchester Road and Whisper Heights/Pourroy Road.

BICYCLE FACILITIES

The County of Riverside bicycle facilities are illustrated on Figure 9.

EXISTING ROADWAY VOLUMES

Figure 10 shows the Existing average daily traffic volumes. The Existing average daily traffic volumes have been obtained from the 2017 Traffic Volumes on California State Highways by the California Department of Transportation (Caltrans), and factored from peak hour intersection turning movement volumes using the following formula for each intersection leg:

$$\text{Evening Peak Hour (Approach Volume + Exit Volume)} \times 12.0 = \text{Leg Volume.}$$

Existing peak hour traffic conditions are based upon morning peak period and evening peak period intersection turning movement counts obtained in September 2019 during typical weekday conditions when local schools were in session, and in April 2020. The weekday AM peak period was counted between 7:00 AM and 9:00 AM and the weekday PM peak period was counted between 4:00 PM and 6:00 PM. The actual peak hour within the peak period is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the weekday PM peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume. Intersection turning movement count worksheets are provided in Appendix C.

The current COVID-19 pandemic and related stay-at-home orders imposed by state and local municipalities have resulted in a substantial decrease in traffic volumes. In addition to the long-term economic impact, it is

anticipated that the pandemic may have a lasting effect on travel behaviors, such as an increase telecommuting. To provide a conservative analysis, the “existing” traffic volumes used in this analysis are representative of late-2019, pre-pandemic conditions, which are likely to overestimate actual volumes for the near future, even as stay-at-home orders are eased.

For the majority of the study intersections, pre-pandemic data was available based on intersection turning movement counts conducted in September 2019. Due to an absence of historical pre-pandemic data, new intersection turning movement counts were conducted in April 2020 at the following intersections:

- Winchester Road [SR-79] at Blue Spruce Lane/Algarve Avenue - #3
- Leon Road at Baxter Road/Jean Nicholas Road - #6
- Mauna Loa Road/Project Driveway (NS) at Jean Nicholas Road - #7

The intersection of Winchester Road (SR-79) at Jean Nicholas Road/Skyview Road was also counted in April 2020 for comparison to September 2019 volumes. The intersection turning movement counts for the three study intersections that were only counted in April 2020 were increased by factors derived from the volume differences between the September 2019 and April 2020 traffic counts for each leg and direction of traffic flow. The adjustment worksheet is provided in Appendix C.

This methodology is intended to reflect pre-pandemic conditions, which are likely to overestimate actual existing conditions for the near future. For example, the April 2020 counts at the intersection of Leon Road at Baxter Road/Jean Nicholas Road show a total entering volume of 320 trips during the AM peak hour and 502 trips during the PM peak hour. Based on the adjustment factors derived from September 2019 counts, the adjusted volumes at this intersection are equal to 1,196 trips during the AM peak hour and 878 trips during the PM peak hour (374% and 175% increase, respectively).

Figure 11 and Figure 12 show the Existing AM and PM peak hour intersection turning movement volumes (with applicable adjustments to represent pre-pandemic conditions).

EXISTING LEVELS OF SERVICE

The intersection Levels of Service for Existing conditions have been calculated and are shown in Table 1. Existing intersection Level of Service worksheets are provided in Appendix D.

As shown in Table 1, the study intersections currently operate within acceptable Levels of Service during the peak hours for Existing conditions, except for the following study intersection:

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM peak hour – LOS E)

As noted in the Future Operational Analysis section of this report, the following improvements would eliminate the existing Level of Service deficiency.

- Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW) – #4
 - Eastbound: Restripe to provide a second left turn lane.

Table 1
Existing Intersection Levels of Service

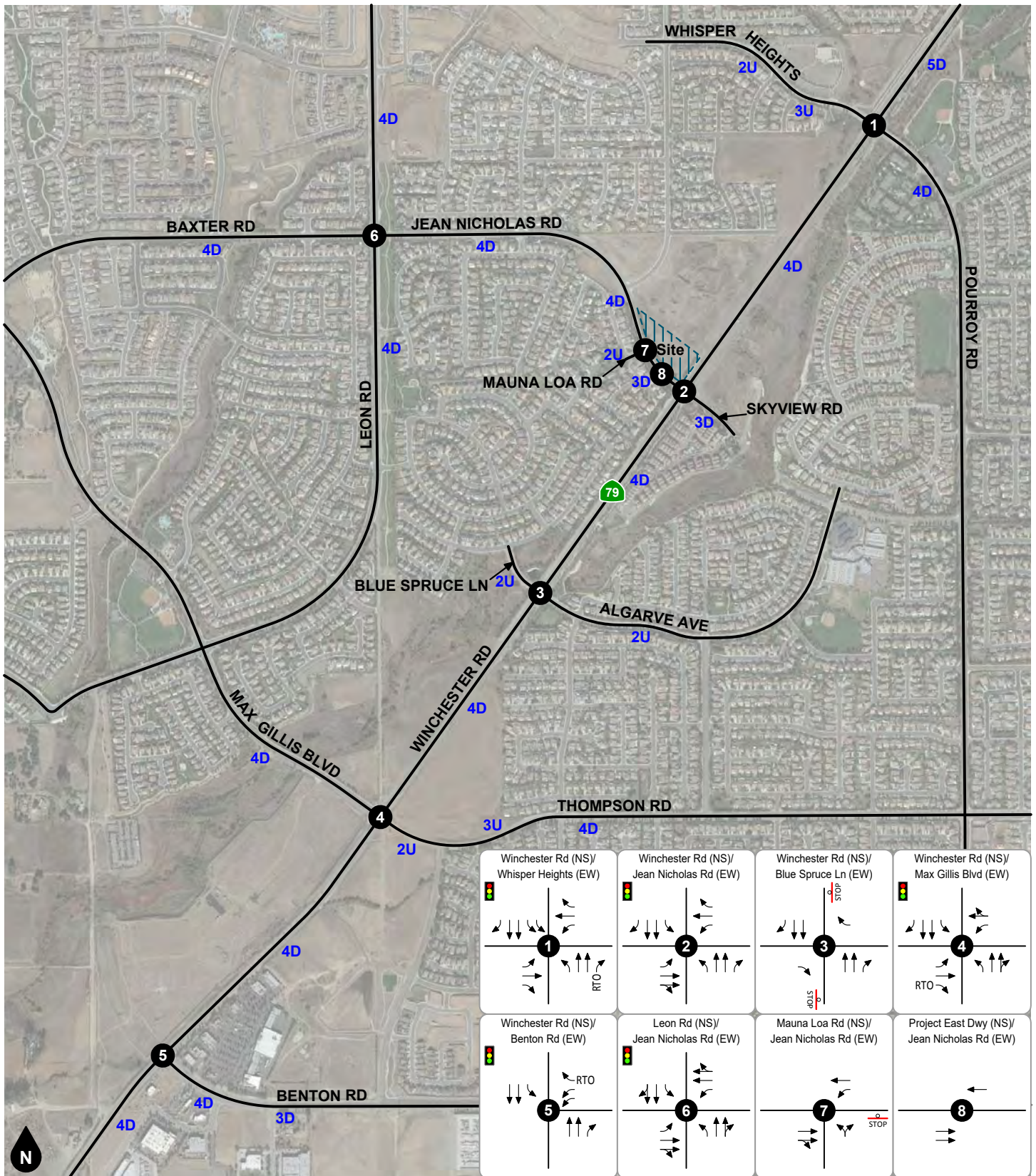
Study Intersection	Traffic Control ¹	AM Peak Hour		PM Peak Hour	
		Delay ²	LOS ³	Delay	LOS
1. Winchester Rd at Whisper Heights/Pourroy Rd	TS	18.1	B	24.8	C
2. Winchester Rd at Jean Nicholas Rd/Skyview Rd	TS	13.2	B	13.7	B
3. Winchester Rd at Blue Spruce Ln/Algarve Ave	CSS	18.1	C	18.4	B
4. Winchester Rd at Max Gillis Blvd/Thompson Rd	TS	55.2	E	53.4	D
5. Winchester Rd at Benton Rd	TS	13.9	B	29.5	C
6. Leon Rd at Baxter Rd/Jean Nicholas Rd	TS	20.8	C	18.0	B
7. Mauna Loa Rd/Project Driveway at Jean Nicholas Rd	CSS	13.8	B	14.1	B

Notes:

(1) TS = Traffic Signal; CSS = Cross Street Stop

(2) Delay is shown in seconds/vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service



Legend

Traffic Signal

Stop Sign

#D #-Lane Divided Roadway

#U #-Lane Undivided Roadway

Existing Lane

RTO Right Turn Overlap

Figure 3
Existing Lane Geometry and Intersection Traffic Controls

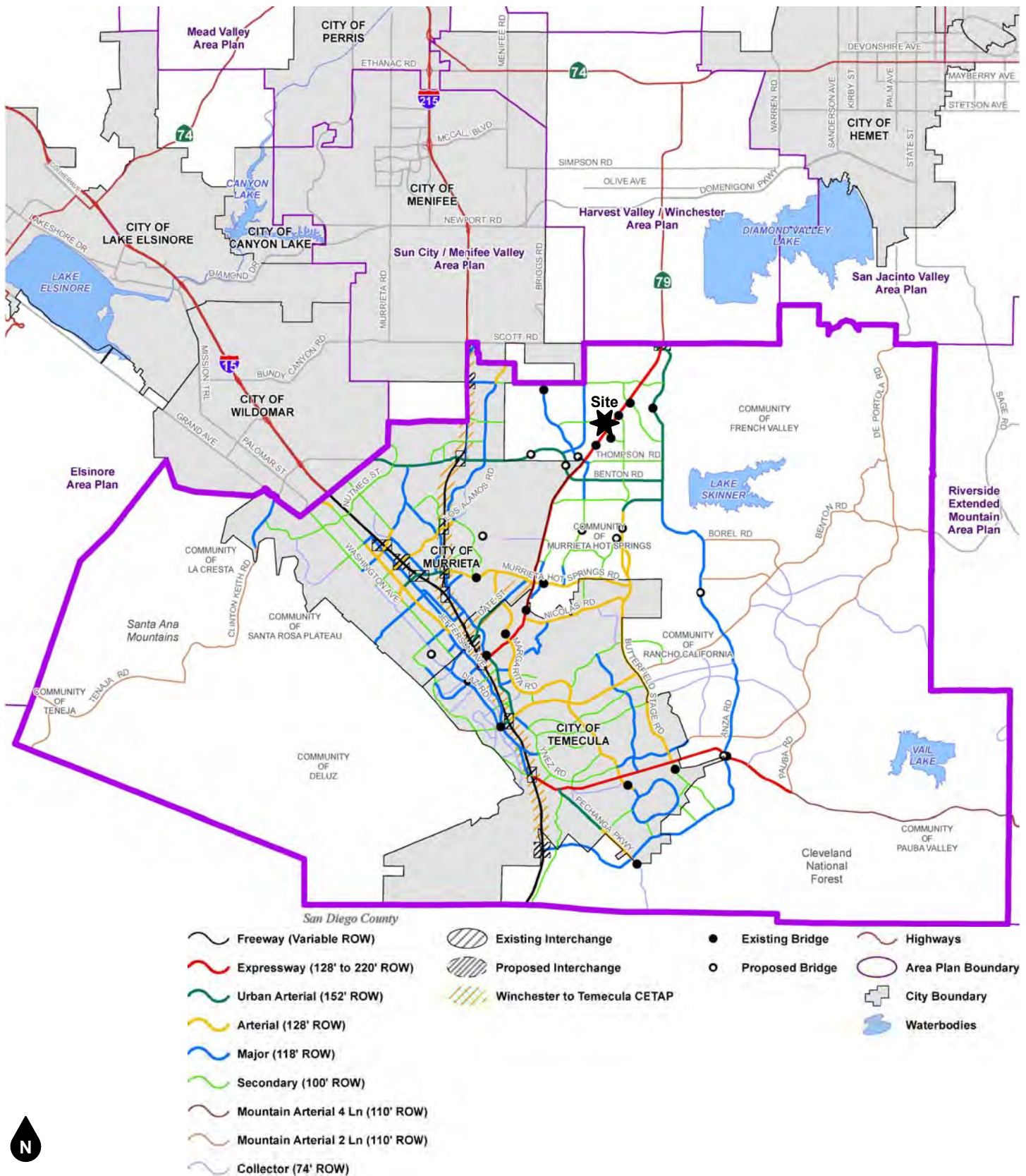
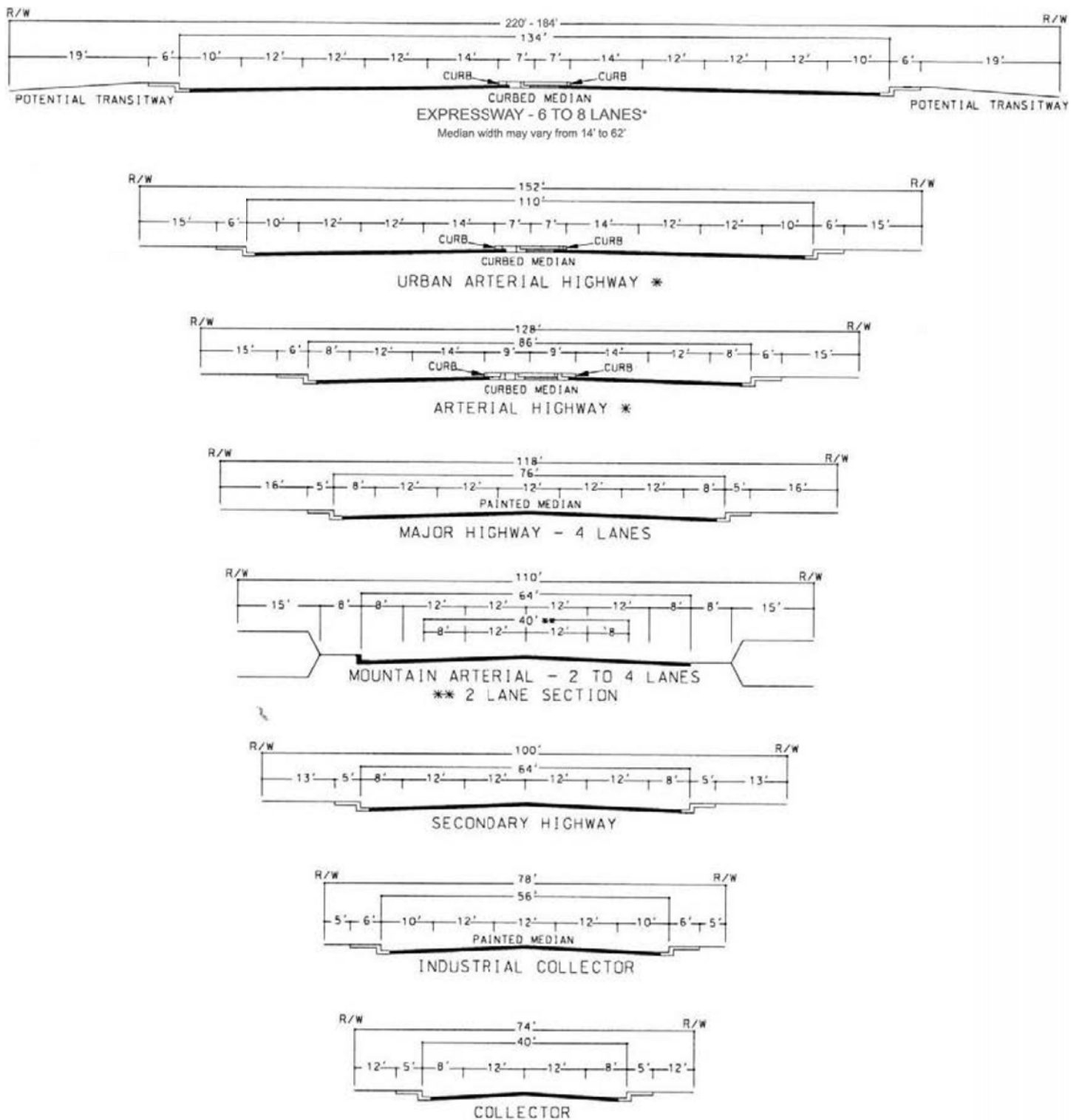


Figure 4
County of Riverside General Plan Circulation Element

Source: County of Riverside



*IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE. ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.

Figure 5
County of Riverside General Plan (Southwest Area)
Roadway Cross-Sections

Source: County of Riverside

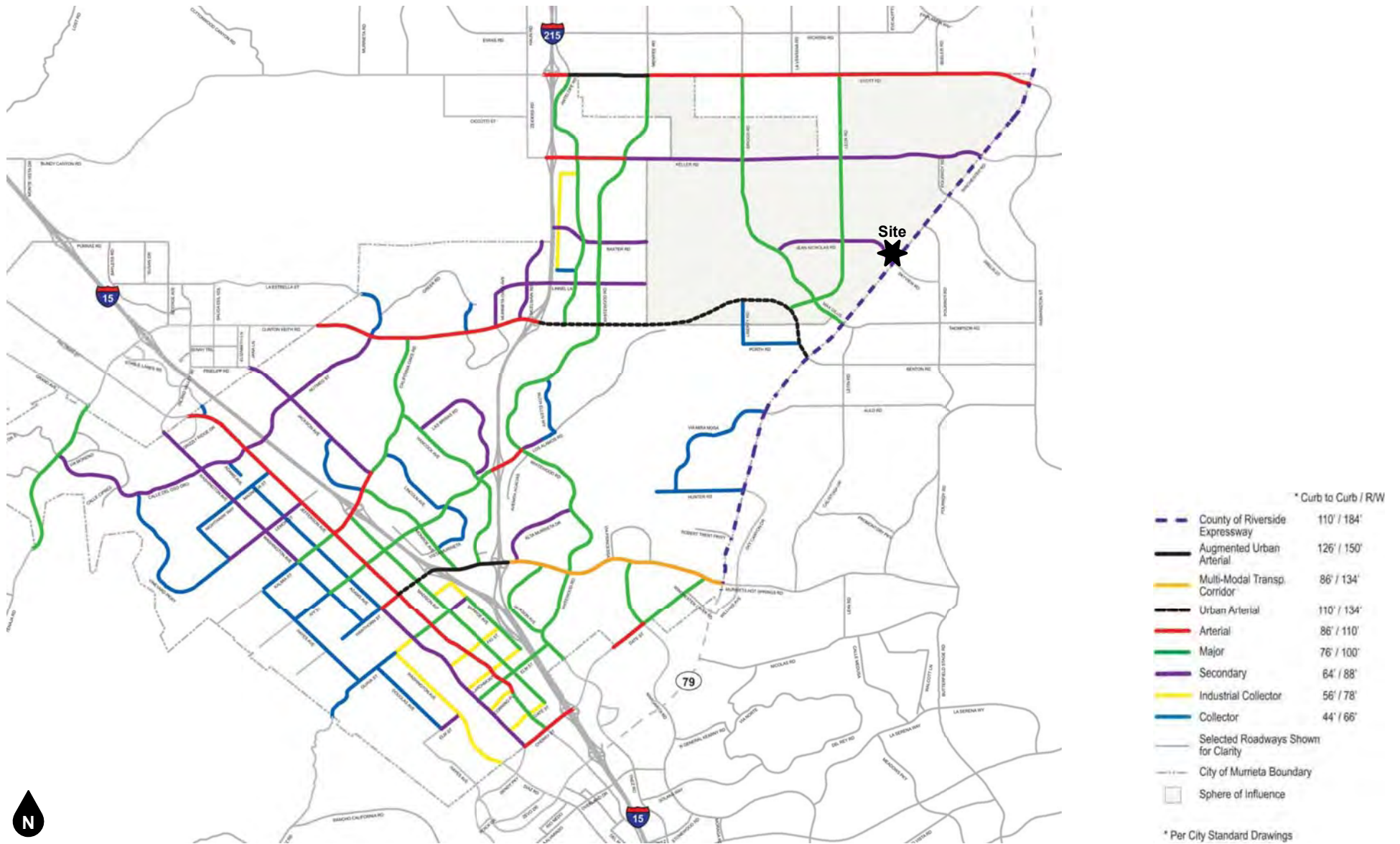


Figure 6
City of Murrieta General Plan Circulation Element

Source: City of Murrieta

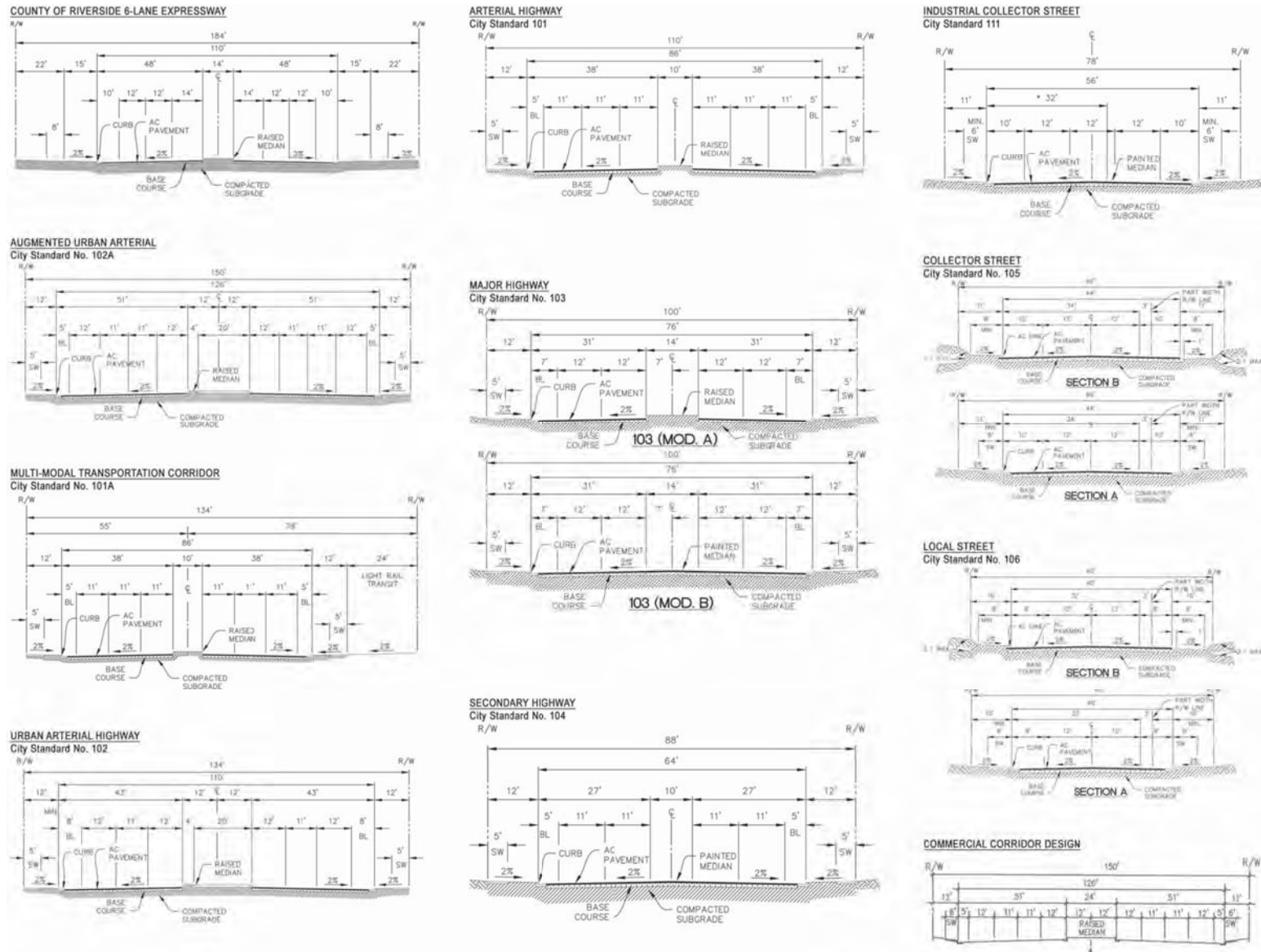


Figure 7
City of Murrieta General Plan Roadway Cross-Sections

Source: City of Murrieta

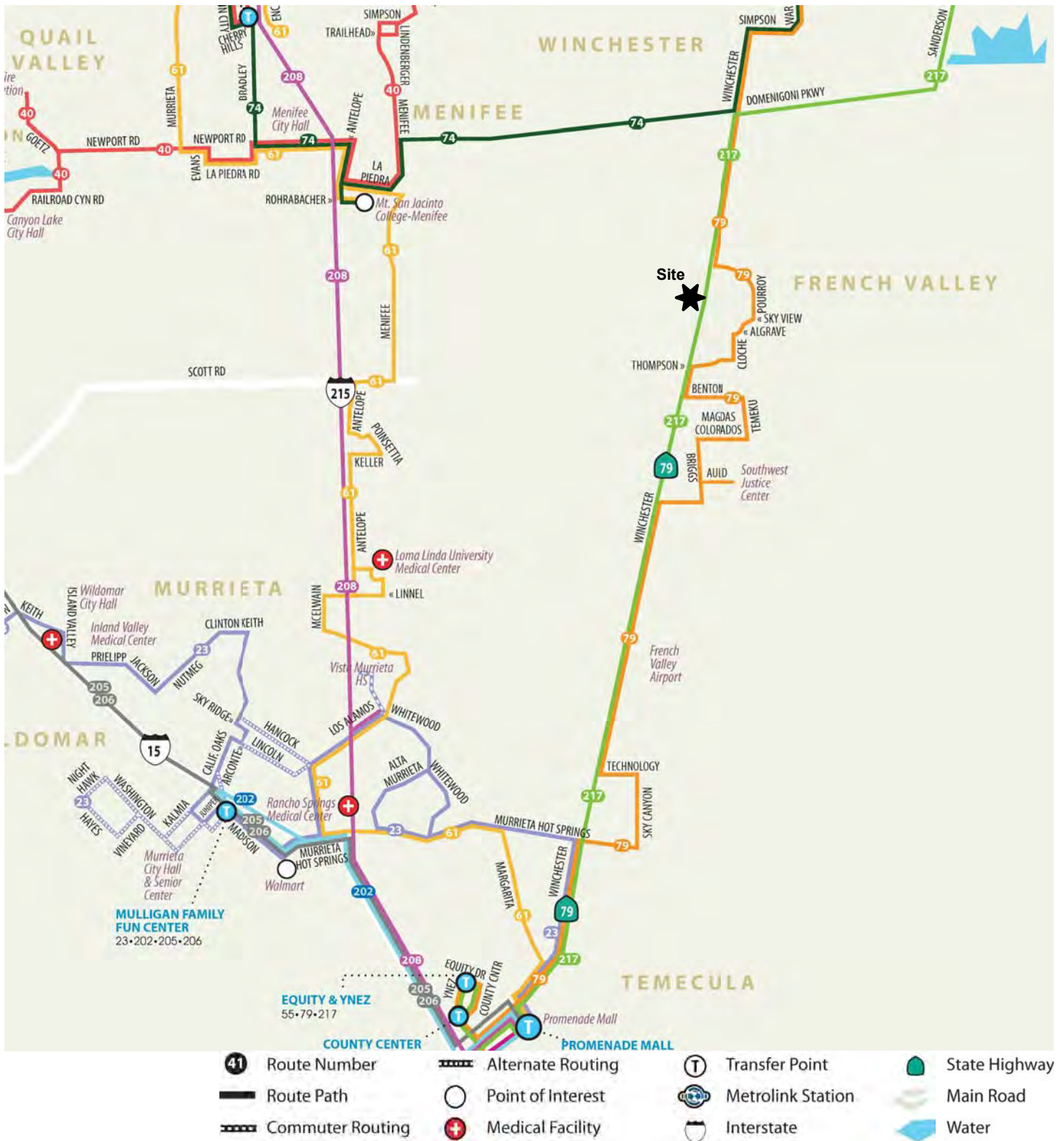


Figure 8
Existing Transit Routes

Source: Riverside Transit Agency

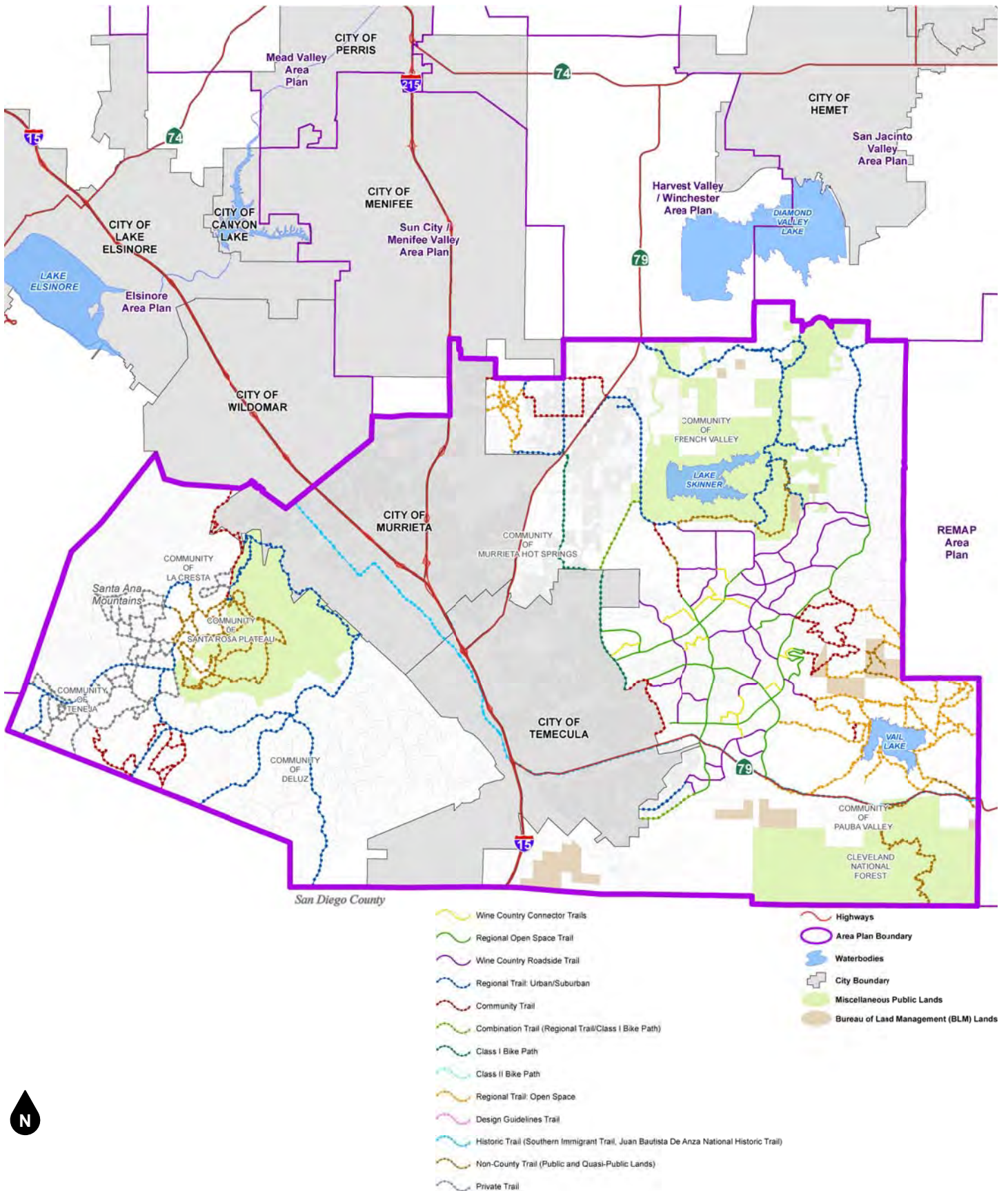


Figure 9
County of Riverside General Plan Bike Routes

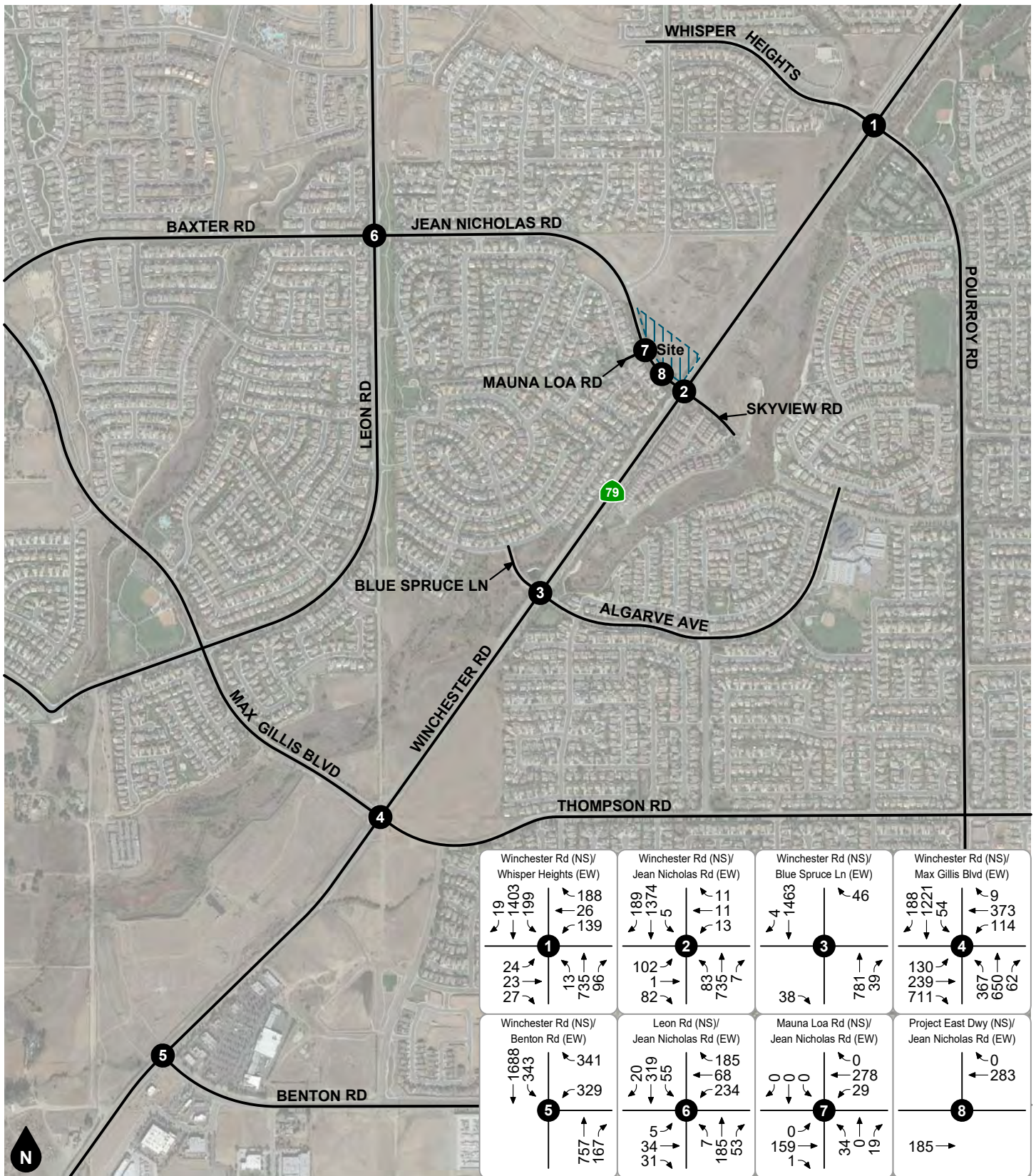
Source: County of Riverside



Legend

●## Vehicles Per Day (1,000's)

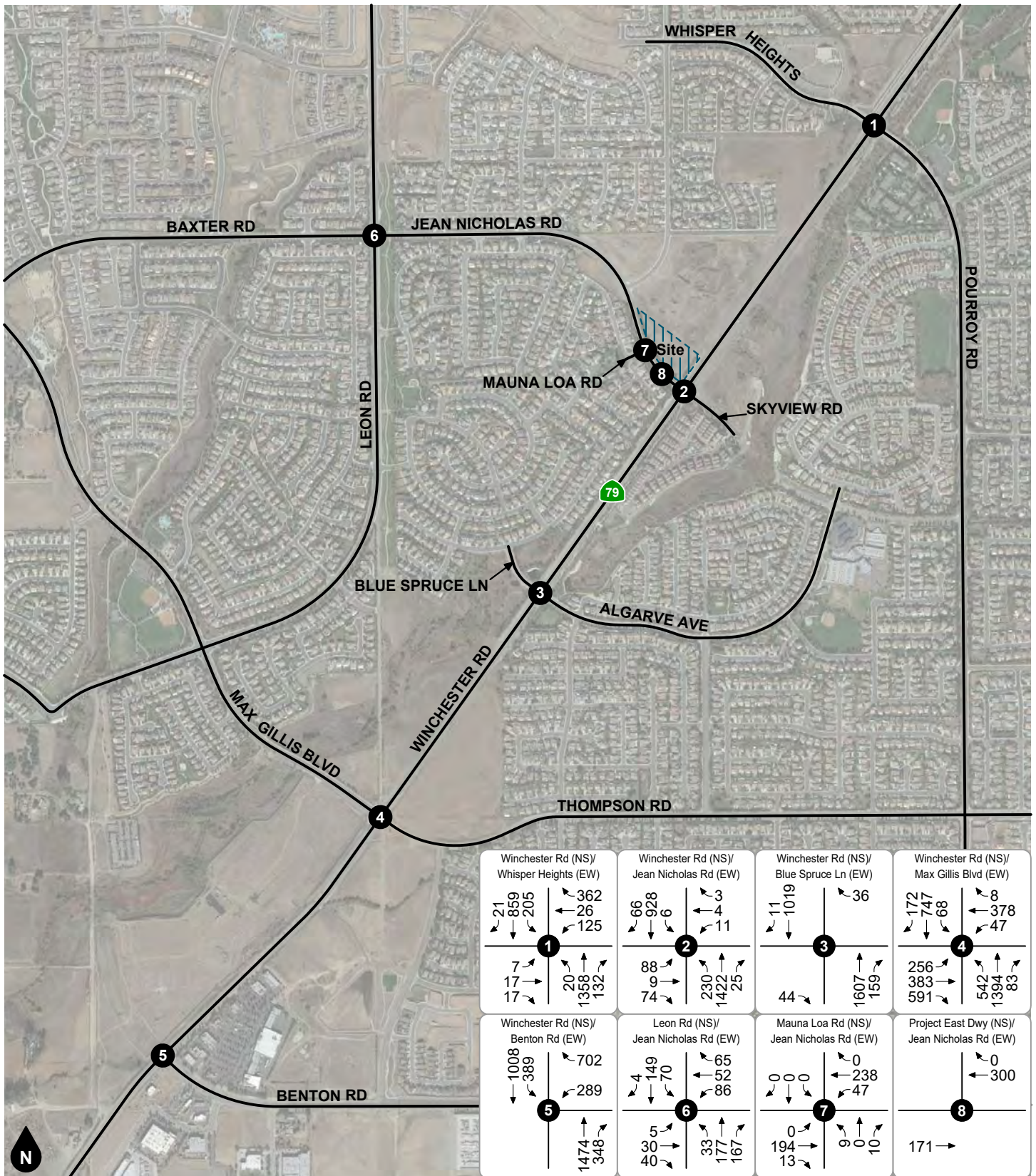
Figure 10
Existing Average Daily Traffic Volumes



Legend

Study Intersection

Figure 11
Existing AM Peak Hour Intersection Turning Movement Volumes



Legend

Study Intersection

Figure 12
Existing PM Peak Hour Intersection Turning Movement Volumes

4. PROJECT TRIP FORECASTS

This section describes how project trip generation, trip distribution, and trip assignment forecasts were developed. The forecast project volumes are illustrated on figures contained in this section.

PROJECT TRIP GENERATION

Table 2 shows the project trip generation based upon trip generation rates obtained from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. Trip generation rates were determined for daily trips, AM peak hour inbound and outbound trips, and PM peak hour inbound and outbound trips for the proposed land use. The number of trips forecast to be generated by the proposed project are determined by multiplying the trip generation rates by the land use quantity.

As shown in Table 2, the proposed project is forecast to generate a total of approximately 5,185 daily trips, including 290 trips during the AM peak hour and 218 trips during the PM peak hour.

OTHER FACTORS AFFECTING TRIP GENERATION

Land uses such as shopping centers, restaurants, gasoline stations, and convenience stores will often locate next to busy roadways to attract motorists already on the street. Since the trip generation rates contained in the ITE Trip Generation Manual represent vehicles entering and exiting at the site driveway(s), it is appropriate to reduce the initial trip generation forecast by the applicable pass-by trip rate when calculating the net new trips that will be added to the surrounding street system. This analysis applies pass-by trip reductions for the fast-food restaurant with drive-thru (49% AM peak hour, and 50% PM peak hour) and super convenience market/gas station (62% AM peak hour and 56% PM peak hour) land uses based on pass-by rates from the ITE Trip Generation Handbook (3rd Edition, 2017).

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Figure 13 to Figure 15 show the forecast directional outbound and inbound distribution patterns for the project generated trips. The project trip distribution patterns are based on review of existing volume data, surrounding land uses, and the local and regional roadway facilities in the project vicinity.

Based on the identified project trip generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 16. Project AM and PM peak hour intersection turning movement volumes expected from the project are depicted on Figure 17 and Figure 18, respectively.

Table 2
Project Trip Generation

Trip Generation Rates									
Land Use	Source ¹	Units ²	AM Peak Hour			PM Peak Hour			Daily Rate
			% In	% Out	Rate	% In	% Out	Rate	
Coffee Shop with Drive-Thru	ITE 937	TSF	51%	49%	88.99	50%	50%	43.38	820.38
Super Convenience Market/Gas Station ³	ITE 960	VFP	50%	50%	28.08	50%	50%	22.96	230.52

Trips Generated									
Land Use	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Coffee Shop with Drive-Thru	2,627	TSF	119	115	234	57	57	114	2,155
- Pass-By Reduction (49% AM, 50% PM) ⁴			-58	-56	-114	-29	-29	-58	-172
Super Convenience Market/Gas Station	16	VFP	225	225	450	184	184	368	3,688
- Pass-By Reduction (62% AM, 56% PM) ⁴			-140	-140	-280	-103	-103	-206	-486
Total			146	144	290	109	109	218	5,185

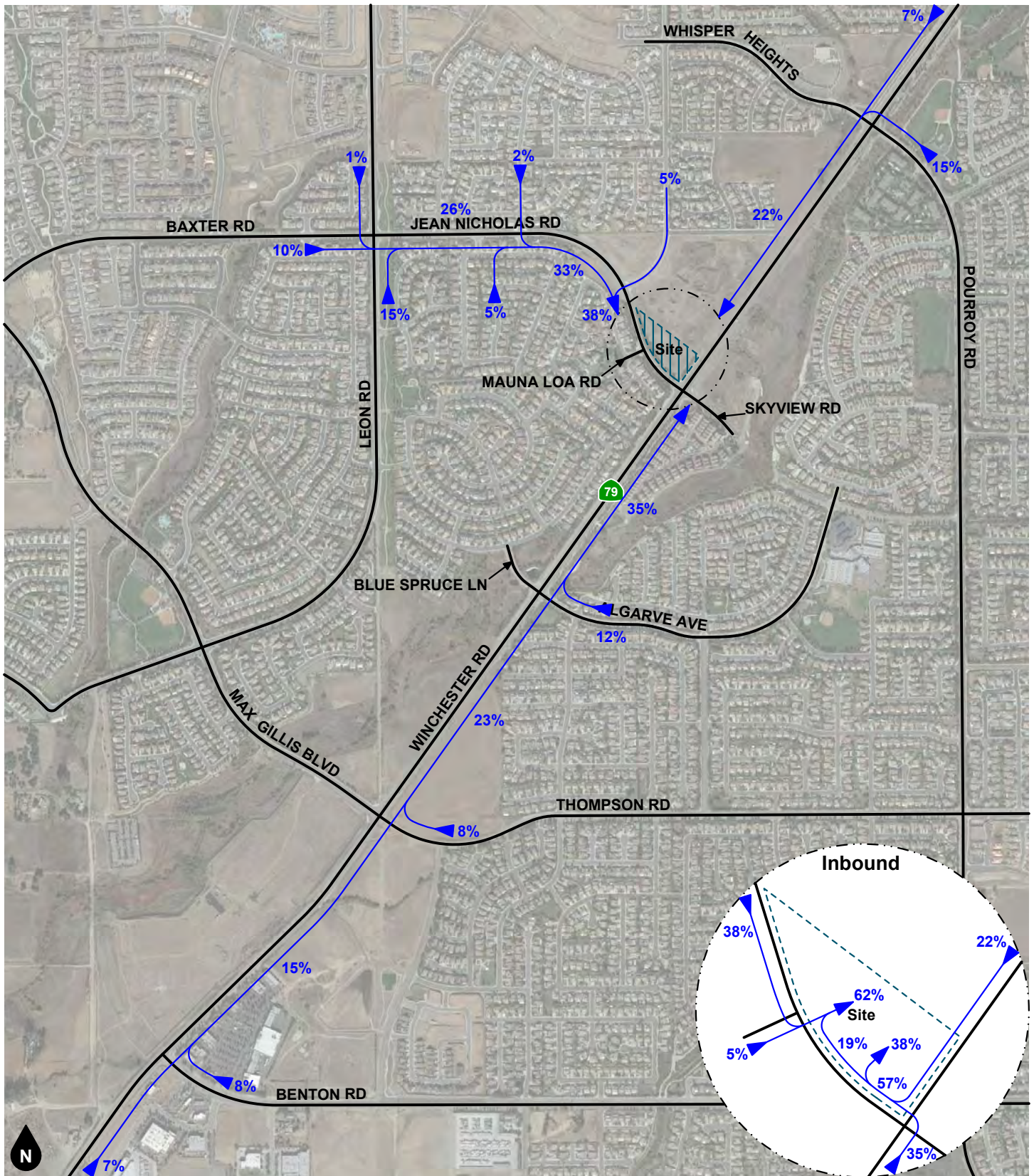
Notes:

(1) ITE = Institute of Transportation Engineers Trip Generation Manual (10th Edition, 2017); ### = Land Use Code.

(2) TSF = Thousand Square Feet; VFP = Vehicle Fueling Positions

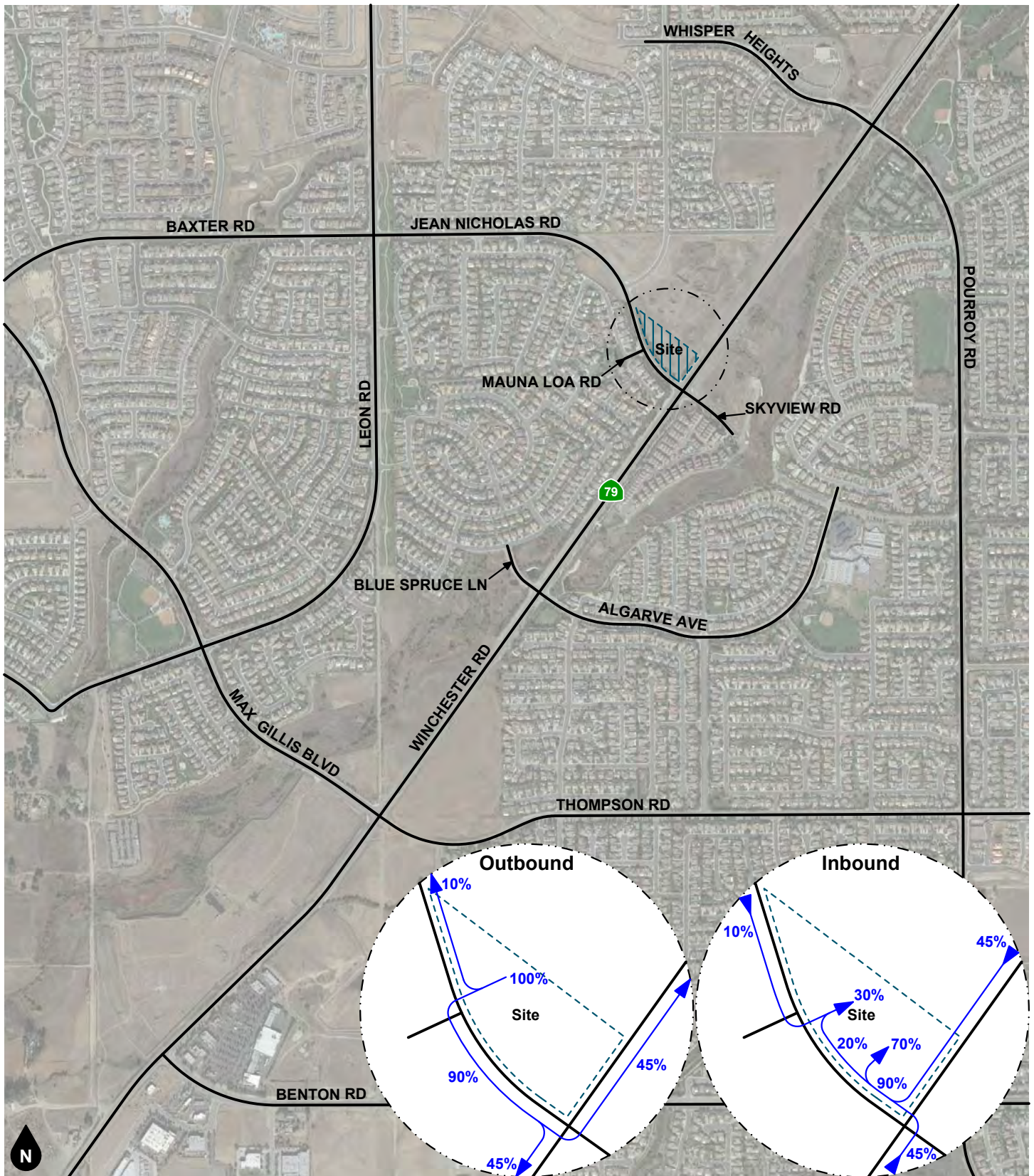
(3) The ITE Trip Generation Manual describes Super Convenience Market/Gas Station (ITE 960) land uses as having a gross floor area greater than 3,000 square feet and at least 10 vehicle fueling positions. Additionally, the Trip Generation Manual states that these service stations may also have ancillary facilities serving motor vehicles and may have a car wash. Therefore, this land use includes trips associated with ancillary car wash facilities and provides a more conservative estimate than another similar land use (ITE 945 - Gasoline/Service Station with Convenience Market).

(4) Source: ITE Trip Generation Handbook (3rd Edition, 2017). In the absense of pass-by data for ITE 937 and 960, the pass-by rates for ITE 934 (Fast-Food Restaurant with Drive-Through) and 945 (Gasoline/Service Station with Convenience Market) were utilized as they are similar land uses with comparable pass-by characteristics.



Legend
 10% Percent To Project

Figure 14
Project Inbound Trip Distribution



Legend

← 10% Percent To/From Project

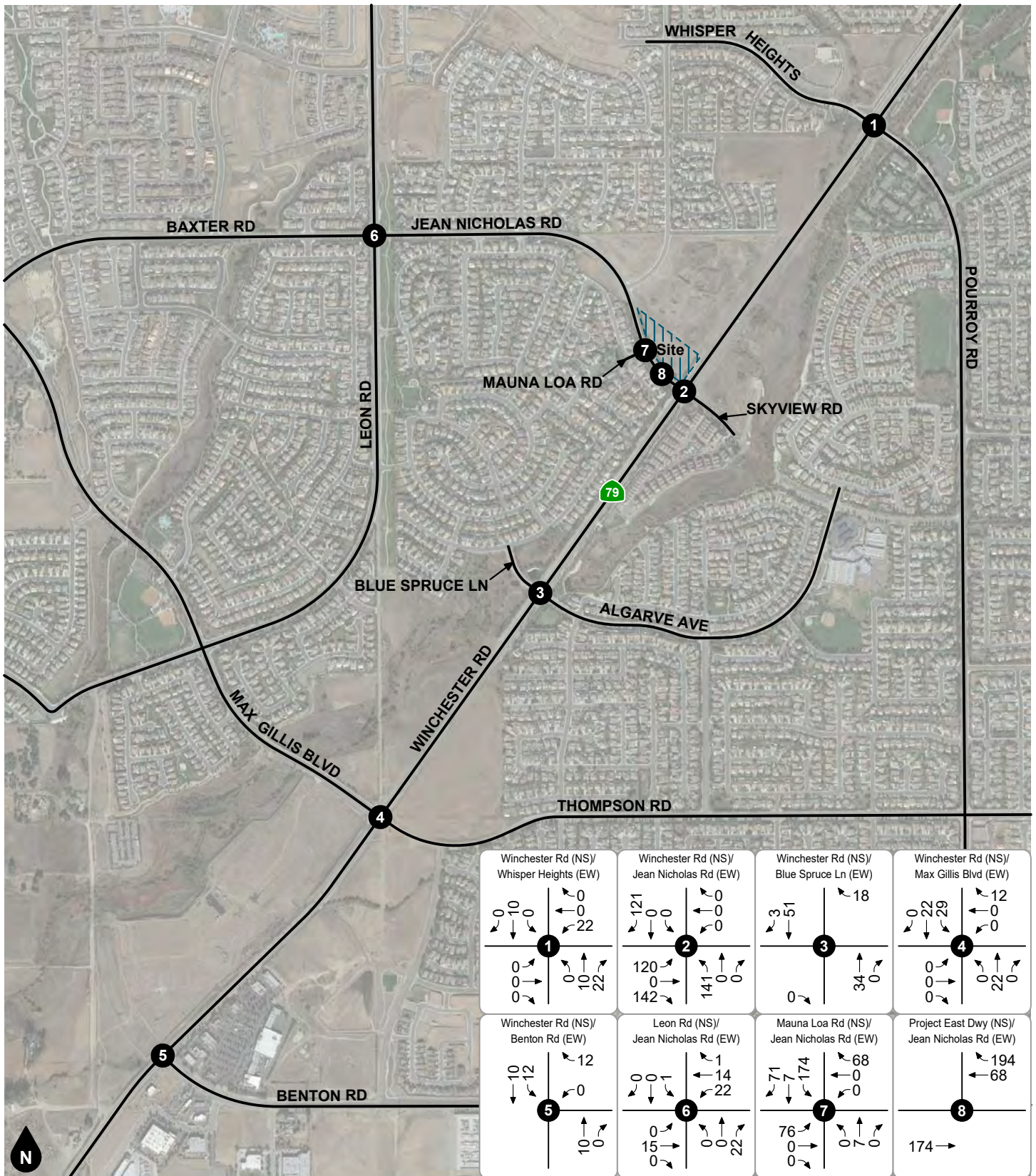
Figure 15
Project Pass-By Trip Distribution



Legend

●## Vehicles Per Day (1,000's)

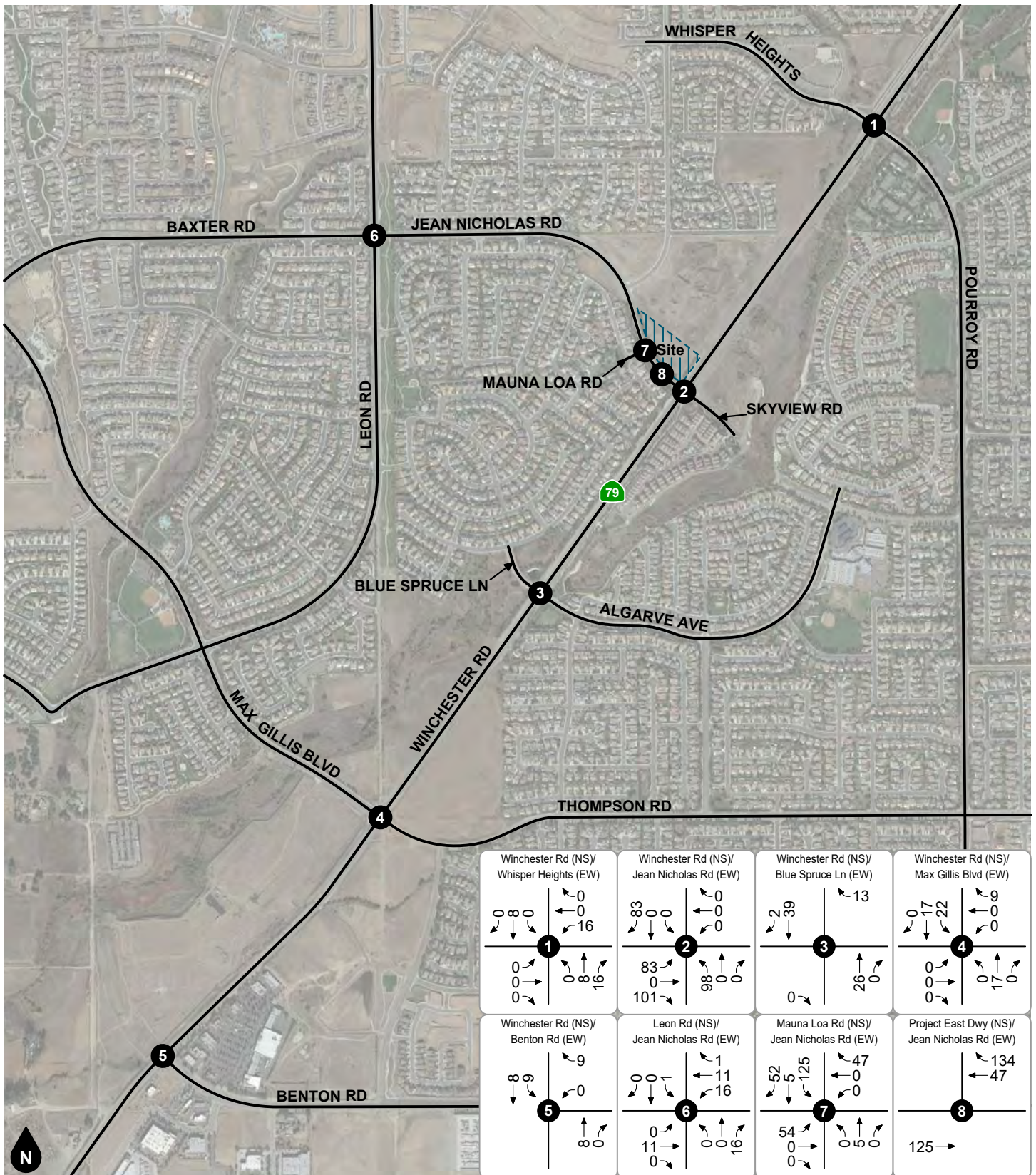
Figure 16
Project Average Daily Traffic Volumes



Legend

Study Intersection

Figure 17
Project AM Peak Hour Intersection Turning Movement Volumes



Legend
 # Study Intersection

Figure 18
Project PM Peak Hour Intersection Turning Movement Volumes

5. FUTURE VOLUME FORECASTS

This section describes how future volume forecasts for each analysis scenario were developed. Forecast study area volumes are illustrated on figures contained in this section.

CUMULATIVE TRIPS

Ambient Growth Rate

To account for ambient growth on roadways, existing roadway volumes were increased by a growth rate of two percent (2%) per year over two years for Opening Year (2022) conditions. This equates to a total growth factor of approximately 1.04. The ambient growth rate was conservatively applied to all movements at the study intersections.

Other Development

To account for trips generated by future development, trips generated by pending or approved other development projects in the project vicinity were added to the study area. Table 3 shows the trip generation summary for other development projects and Figure 19 shows the other development location map.

Figure 20 shows the forecast average daily traffic volumes for the other development. Figure 21 and Figure 22 show the forecast morning and evening peak hour intersection turning movement volumes for trips generated by other developments.

ANALYSIS SCENARIO VOLUME FORECASTS

Existing Plus Project

Existing Plus Project volume forecasts were derived by adding the project generated trips to Existing volumes. Existing Plus Project average daily traffic volumes are shown on Figure 23. Existing Plus Project AM and PM peak hour intersection turning movement volumes are shown on Figure 24 and Figure 25.

Existing Plus Ambient Plus Project

To develop Existing Plus Ambient Plus Project volume forecasts, Existing Plus Project volumes were combined with ambient growth. Existing Plus Ambient Plus Project average daily traffic volumes are shown on Figure 26. Existing Plus Ambient Plus Project AM and PM peak hour intersection turning movement volumes are shown Figure 27 and Figure 28.

Existing Plus Ambient Plus Project Plus Cumulative

Existing Plus Ambient Plus Project Plus Cumulative volume forecasts were developed by adding trips generated by other developments to the Existing Plus Ambient Plus Project forecast. Existing Plus Ambient Plus Project Plus Cumulative average daily traffic volumes are shown on Figure 29. Existing Plus Ambient Plus Project Plus Cumulative AM and PM peak hour intersection turning movement volumes are shown on Figure 30 and Figure 31.

Table 3
Other Development Trip Generation

Project	Land Use	Source ¹	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
					In	Out	Total	In	Out	Total	
CUP03744	Industrial Warehouse (Brewery)	SR	33.025	TSF	15	4	19	23	24	47	443
PP25793	Fast-Food Restaurant with Drive-Thru - Pass-By Reduction (49% AM, 50% PM) ³	ITE 934	2.975	TSF	61	59	120	51	47	98	1,401
					-30	-29	-59	-26	-24	-50	-109
					31	30	61	25	23	48	1,292
PP26047	Office	ITE 712	2.880	TSF	5	1	6	2	5	7	47
PP26212	Mini Storage Car Wash	ITE 151 SANDAG	114.138 4.795	TSF TSF	7	5	12	9	10	19	172
					18	18	36	41	41	82	900
					25	23	48	50	51	101	1,072
PP26344	Shopping Center - Pass-By Reduction (34% PM) ³	ITE 820	133.877	TSF	136	83	219	324	351	675	7,331
					--	--	--	-110	-119	-229	-229
					136	83	219	214	232	446	7,102
PPT180016	Commercial Retail - Pass-By Reduction (34% PM) ³ Business Park	ITE 820 ITE 770	49.100 89.395	TSF TSF	29	18	47	90	97	187	1,854
					--	--	--	-31	-33	-64	-64
					22	14	36	17	20	37	1,112
	Subtotal				51	32	83	76	84	160	2,902
TR31700	Single-Family Detached Residential	ITE 210	64	DU	12	36	48	40	23	63	604
TR32151	Multi-Family Residential	ITE 220	136	DU	14	48	62	48	28	76	996
TR32185	Single-Family Detached Residential ⁴	ITE 210	213	DU	39	118	157	133	78	211	2,011
TR32272	Single-Family Detached Residential	ITE 210	38	DU	7	21	28	24	14	38	359
TR32323	Single-Family Detached Residential	ITE 210	38	DU	7	21	28	24	14	38	359
TR33303	Single-Family Detached Residential	ITE 210	24	DU	4	13	17	15	9	24	227
TR33423	Single-Family Detached Residential	ITE 210	134	DU	25	74	99	84	49	133	1,265
TR35161	Single-Family Detached Residential ⁵	ITE 210	17	DU	3	9	12	11	6	17	160
TR36536	Single-Family Detached Residential ⁶	ITE 210	42	DU	8	23	31	26	15	41	396
TR36687	Single-Family Detached Residential	ITE 210	69	DU	13	38	51	43	25	68	651
TR36722	Single-Family Detached Residential	ITE 210	146	DU	27	81	108	91	53	144	1,378
TR37028	Single-Family Detached Residential	ITE 210	133	DU	25	74	99	83	49	132	1,256
TR37053	Single-Family Detached Residential ⁷	ITE 210	560	DU	104	311	415	349	205	554	5,286
TR37078	Condominiums	ITE 220	168	DU	18	60	78	59	35	94	1,230
TR37089	Single-Family Detached Residential	ITE 210	21	DU	4	12	16	13	8	21	198
TR37294	Single-Family Detached Residential	ITE 210	48	DU	9	27	36	30	18	48	453
TTM37449	Single-Family Detached Residential	ITE 210	372	DU	69	206	275	232	136	368	3,512
FV Library	Library	ITE 590	25.000	TSF	18	7	25	98	106	204	1,801
Total					669	1,352	2,021	1,793	1,290	3,083	35,000

Notes:

(1) ITE = Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code

SR = Staff Report

SANDAG = San Diego Association of Governments, Brief Guide of Vehicular Traffic Generation Rates for San Diego Region, April 2002.

(2) DU = Dwelling Units

(3) ITE = Institute of Transportation Engineers, Trip Generation Handbook, 3rd Edition, 2017.

(4) Development of 426 units is approximately half built.

(5) Development of 51 units is approximately two-thirds built.

(6) Development of 84 units is approximately half built.

(7) Development of 747 units is approximately one-quarter built.

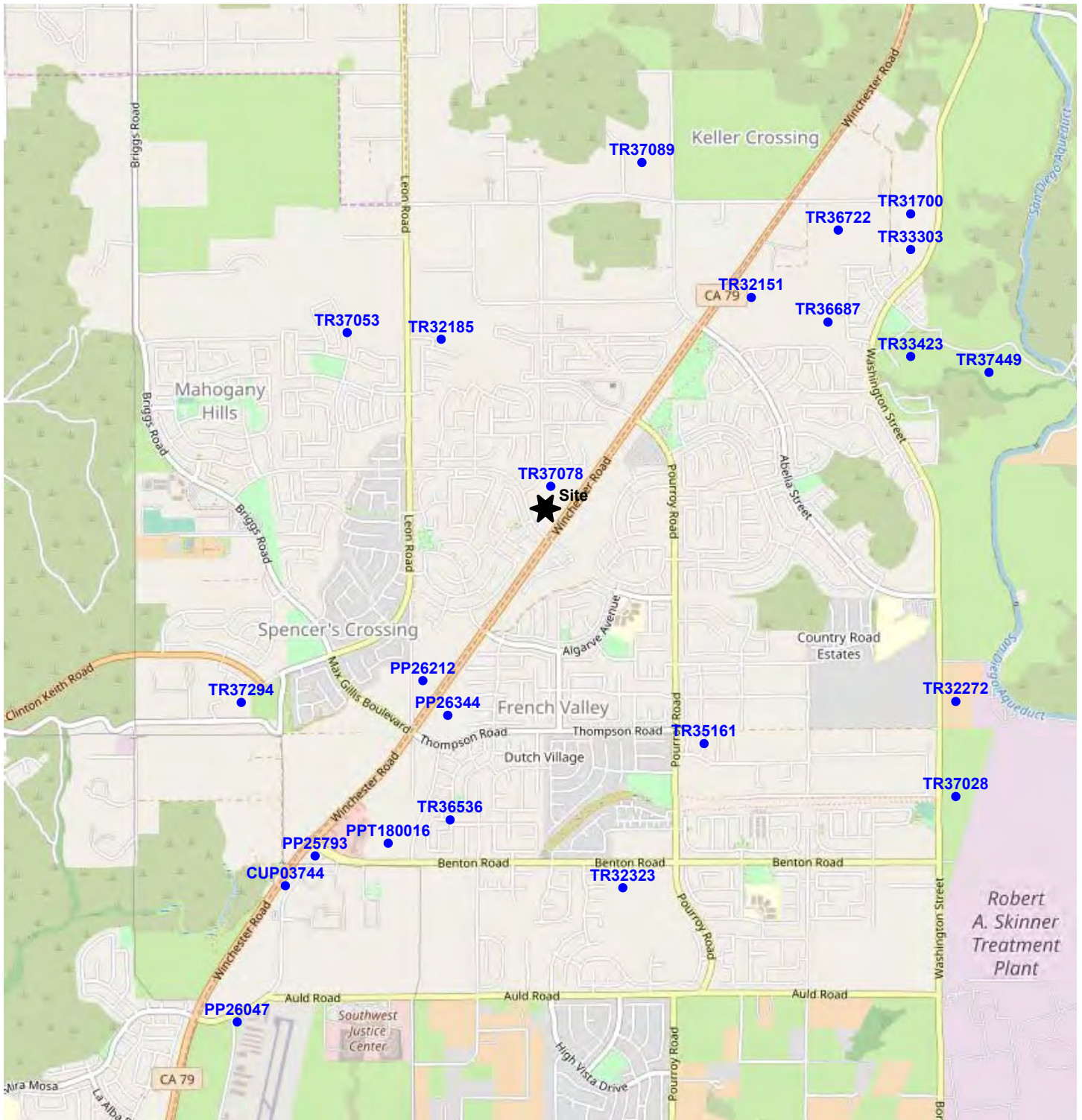


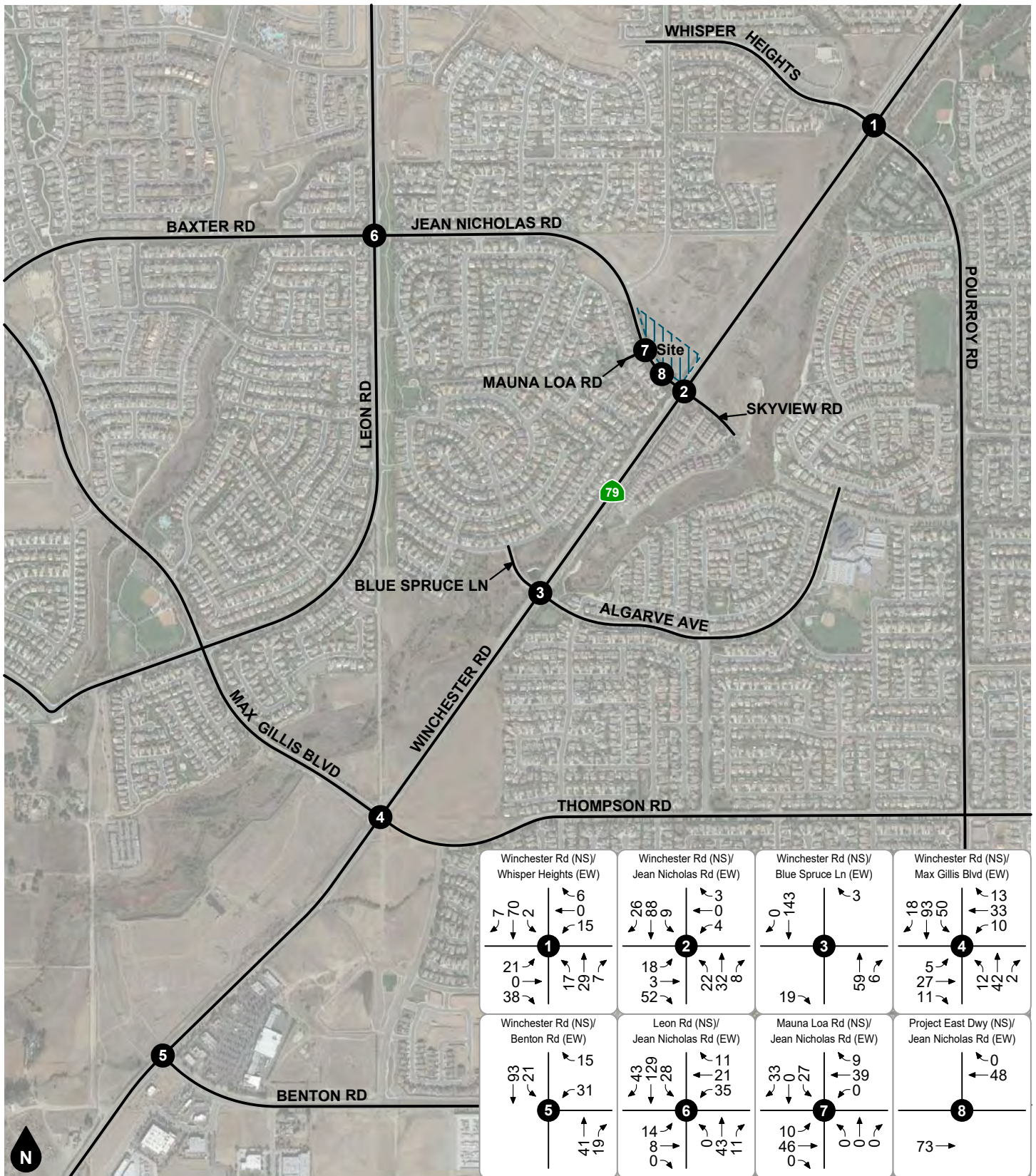
Figure 19
Other Development Location Map



Legend

●## Vehicles Per Day (1,000's)

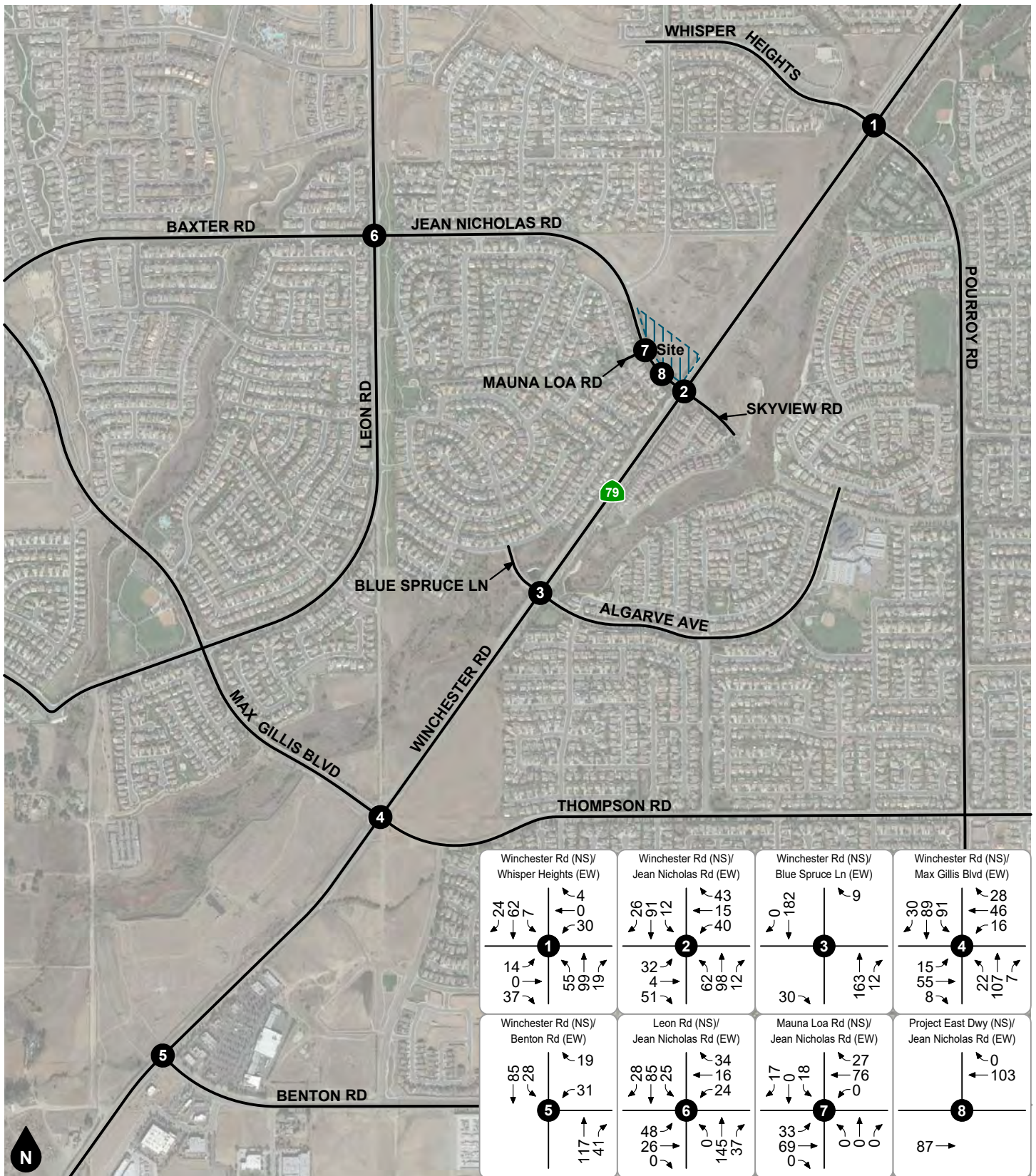
Figure 20
Other Development Average Daily Traffic Volumes



Legend

Study Intersection

Figure 21
Other Development
AM Peak Hour Intersection Turning Movement Volumes



Legend

Study Intersection

Figure 22
Other Development
PM Peak Hour Intersection Turning Movement Volumes



Legend

●## Vehicles Per Day (1,000's)

Figure 23
Existing Plus Project Average Daily Traffic Volumes

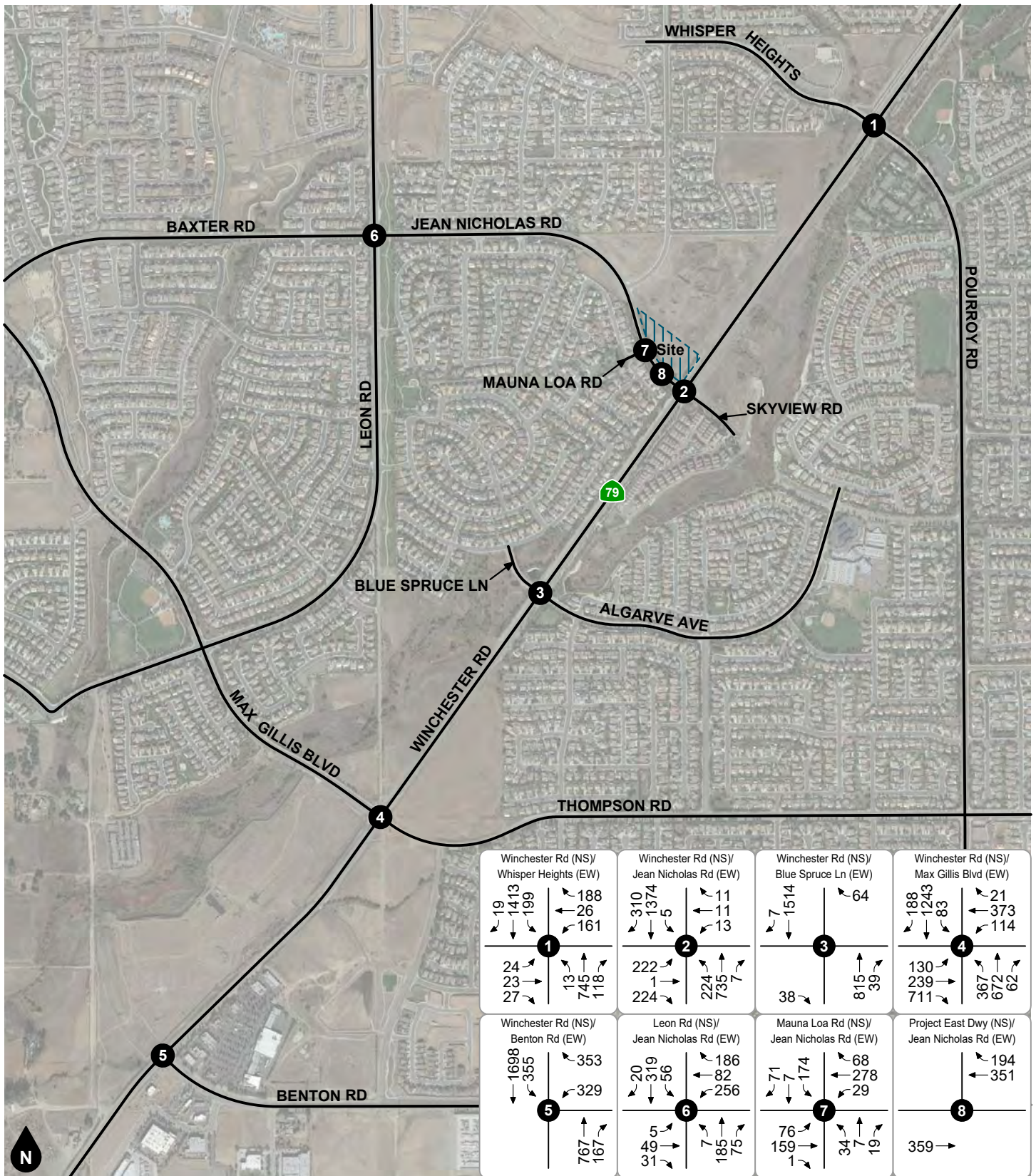
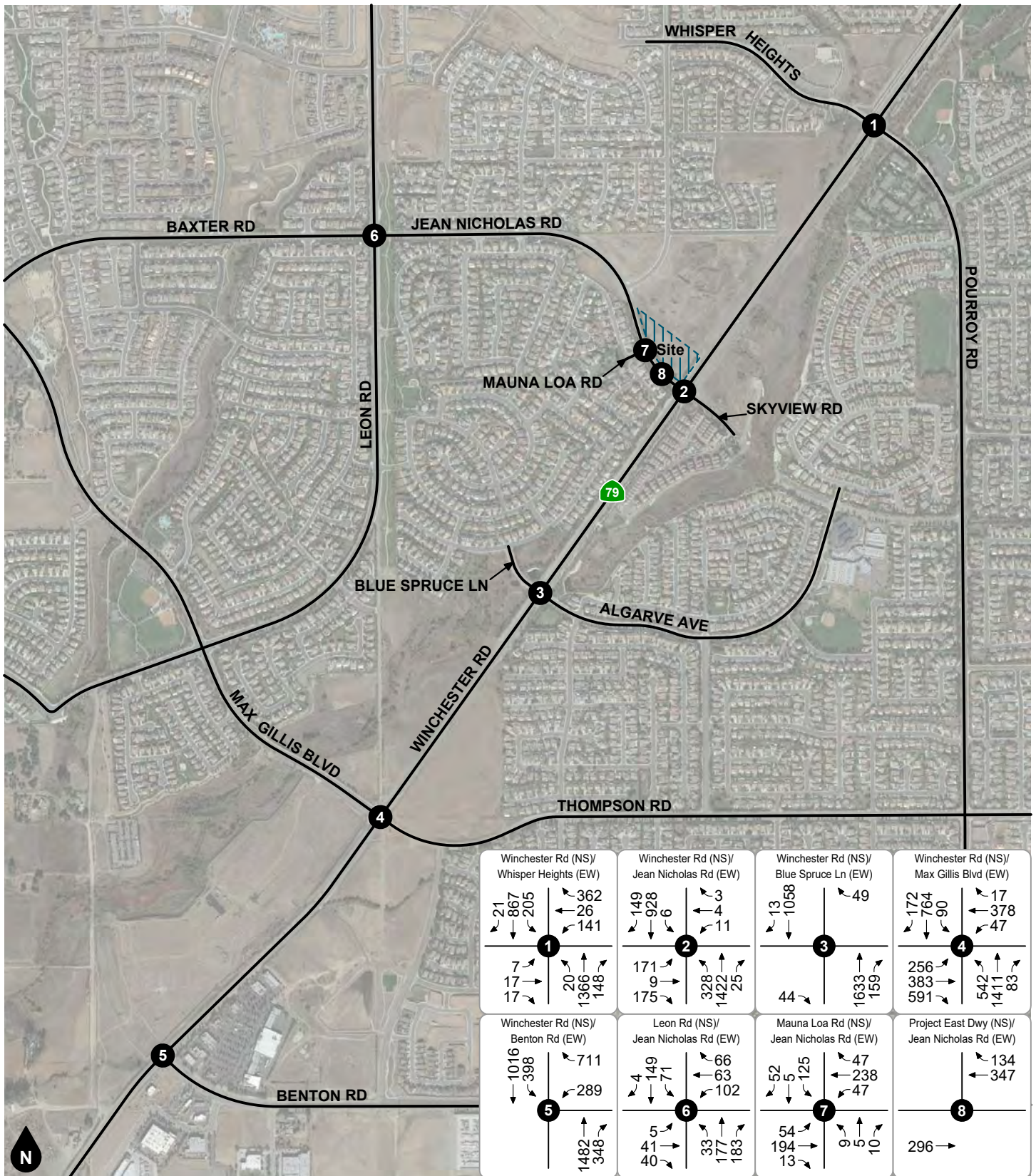


Figure 24
Existing Plus Project
AM Peak Hour Intersection Turning Movement Volumes



Legend

Study Intersection

Figure 25
Existing Plus Project
PM Peak Hour Intersection Turning Movement Volumes



Legend

●## Vehicles Per Day (1,000's)

Figure 26
Existing Plus Ambient Plus Project Average Daily Traffic Volumes

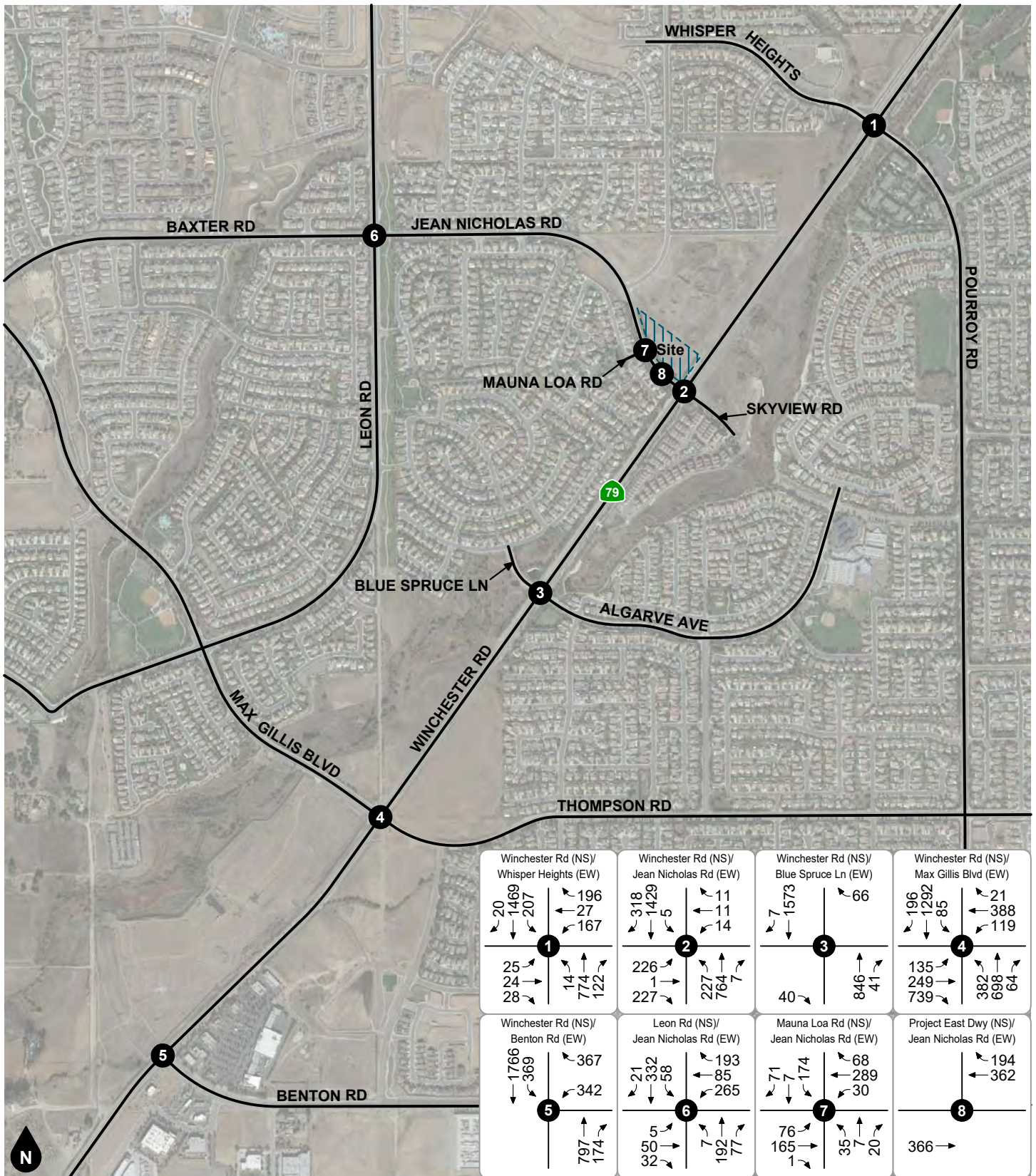
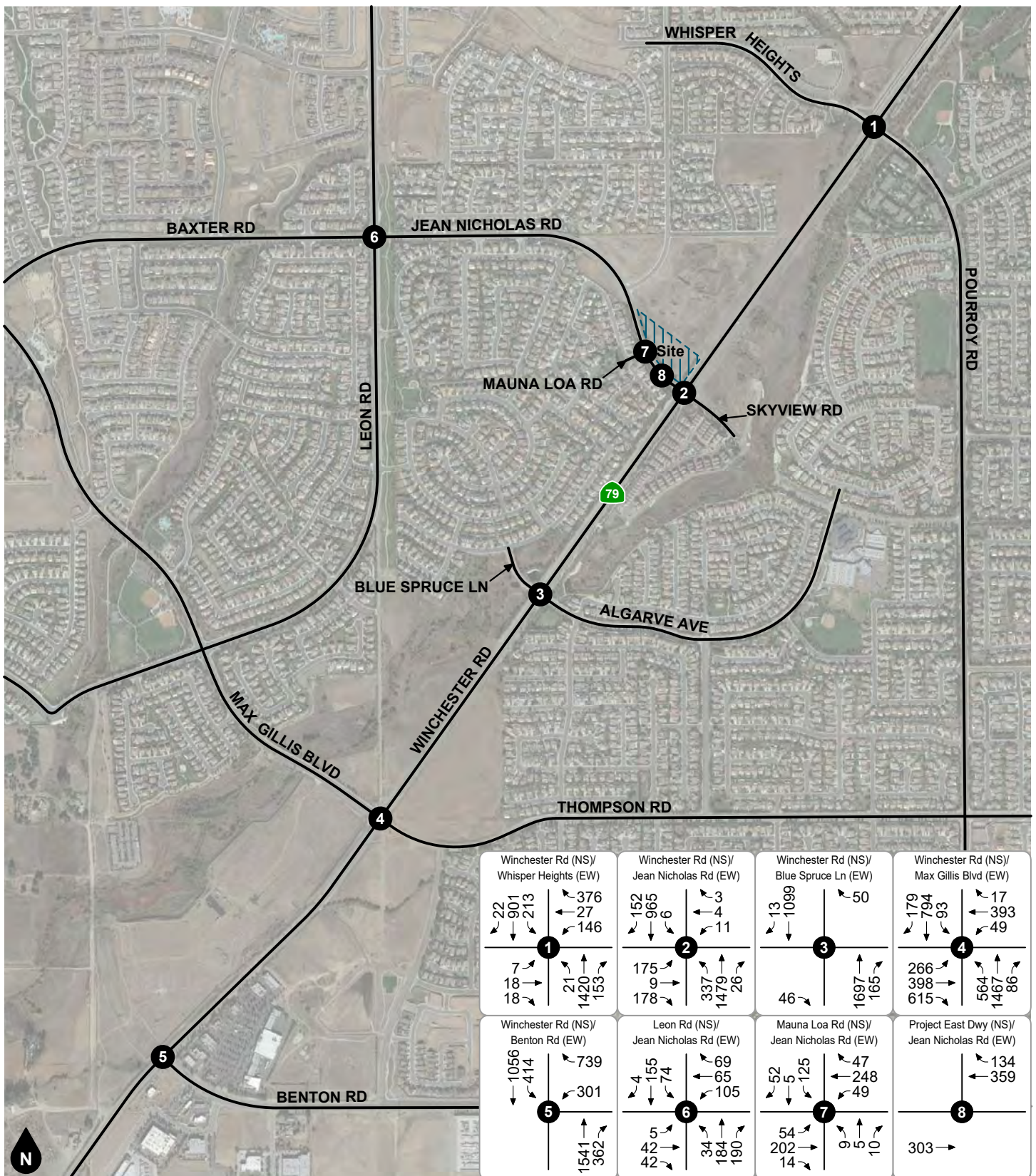


Figure 27
Existing Plus Ambient Plus Project
AM Peak Hour Intersection Turning Movement Volumes



Legend

Study Intersection

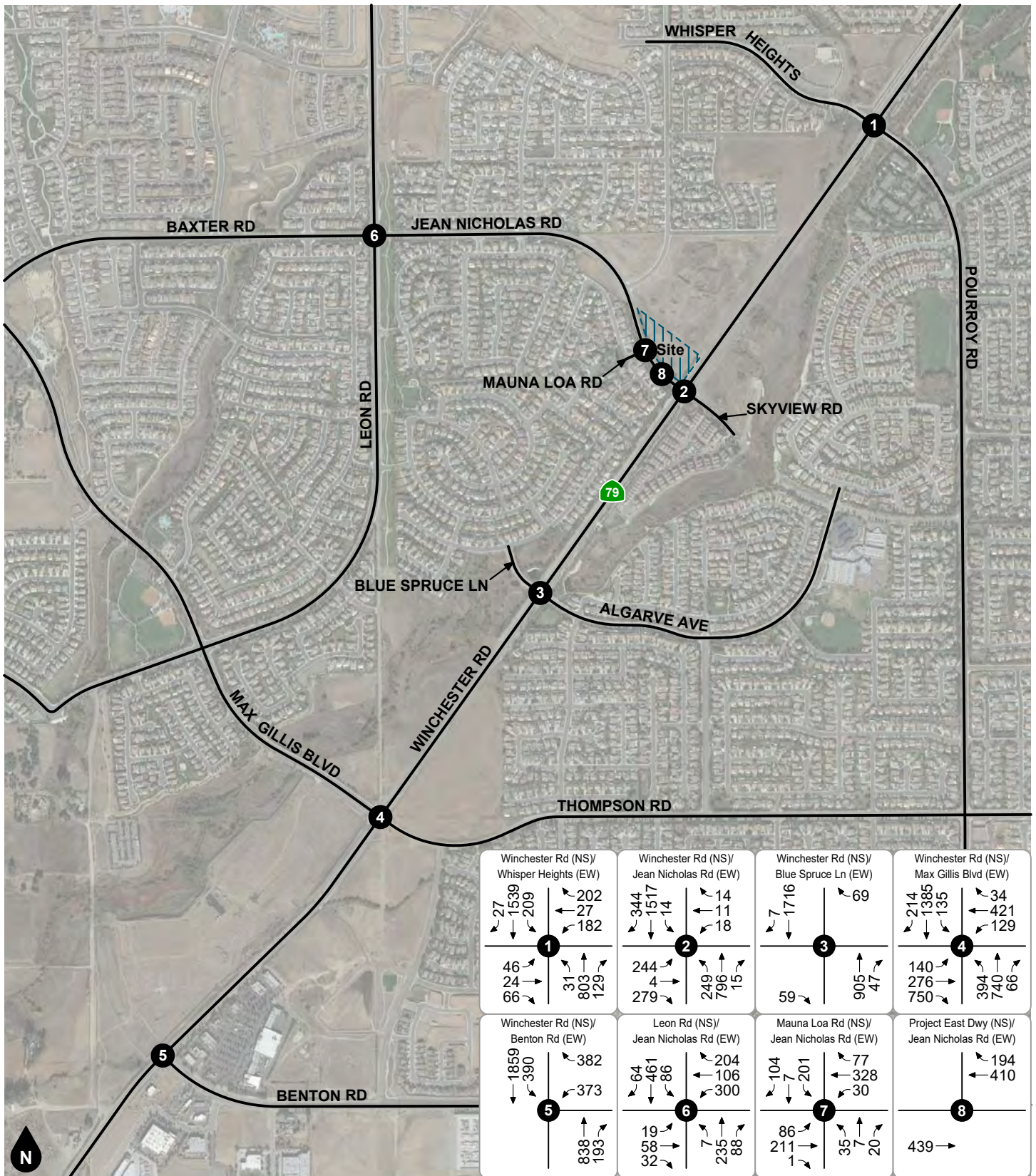
Figure 28
Existing Plus Ambient Plus Project
PM Peak Hour Intersection Turning Movement Volumes



Legend

●## Vehicles Per Day (1,000's)

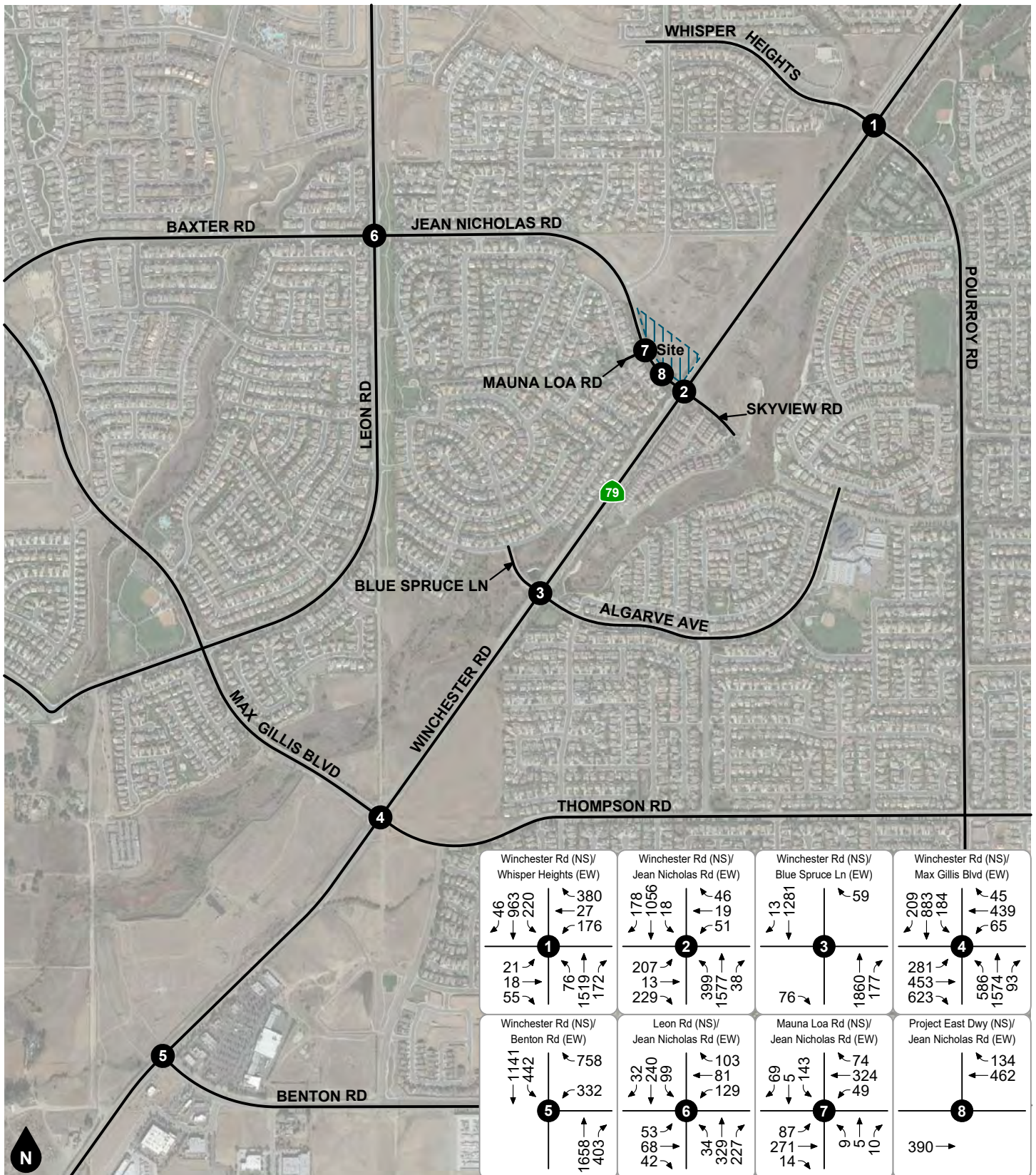
Figure 29
Existing Plus Ambient Plus Project Plus Cumulative
Average Daily Traffic Volumes



Legend

Study Intersection

Figure 30
Existing Plus Ambient Plus Project Plus Cumulative
AM Peak Hour Intersection Turning Movement Volumes



Legend

Study Intersection

Figure 31
Existing Plus Ambient Plus Project Plus Cumulative
PM Peak Hour Intersection Turning Movement Volumes

6. FUTURE OPERATIONAL ANALYSIS

Detailed intersection Level of Service calculation worksheets for each of the following analysis scenarios are provided in Appendix D.

EXISTING PLUS PROJECT

The intersection Levels of Service for Existing Plus Project conditions are shown in Table 4. As shown in Table 4, the study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions, except for the following study intersection that is forecast to continue operating at Level of Service E during the AM peak hour and deteriorate from Level of Service D to E during the PM peak hour:

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM/PM peak hours – LOS E)

The following recommendation has been identified to address the project Level of Service impact for Existing Plus Project conditions:

Recommendation #1:

Prior to project occupancy, the following improvement shall be implemented:

- Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW) – #4
 - Eastbound: Restripe to provide a second left turn lane.

With implementation of Recommendation #1, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Project conditions during the AM and PM peak hours.

EXISTING PLUS AMBIENT PLUS PROJECT

The intersection Levels of Service for Existing Plus Ambient Plus Project conditions are shown in Table 5. As shown in Table 5, the study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Ambient Plus Project conditions, except for the following study intersection that is forecast to continue operating at Level of Service E during the AM peak hour and deteriorate from Level of Service D to E during the PM peak hour:

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM/PM peak hours – LOS E)

In addition to the improvements identified in Recommendation #1, the following additional improvement has been identified to address the project Level of Service impact for Existing Plus Ambient Plus Project conditions:

- Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW) – #4
 - Northbound: Construct a second left turn lane and one dedicated right turn lane.

With implementation of Recommendation #1 and improvements funded by adopted development impact fee programs, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Ambient Plus Project conditions during the AM and PM peak hours; no additional improvements are required.

Since the additional improvement is required with the addition of background ambient growth to existing conditions, but not with the addition of project-generated trips alone, the improvement is considered to address a cumulative impact. Cumulative impacts may be addressed by fair share contributions/development impact fees. Available funding mechanisms are discussed in the following analysis scenario below.

EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE

The intersection Levels of Service for Existing Plus Ambient Plus Project Plus Cumulative conditions are shown in Table 6. As shown in Table 6, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Ambient Plus Project Plus Cumulative conditions, except for the following study intersection that is forecast to continue operating at Level of Service E during the AM peak hour and deteriorate from Level of Service D to F during the PM peak hour:

- Winchester Road [SR-79] at Max Gilliss Boulevard/Thompson Road – #4 (AM – LOS E, PM – LOS F)
- Moana Loa Road/Project Driveway at Jean Nicholas Road – #7 (AM/PM peak hours – LOS F)

The following improvements have been identified to address the cumulative project Level of Service impact:

- Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW) – #4
 - Northbound: Construct a second left turn lane and one dedicated right turn lane.
 - Southbound: Construct a third through lane.
 - Eastbound: Restripe to provide a second left turn lane.
 - Westbound: Construct a second through lane.
- Mauna Loa Road/Project Driveway (NS) at Jean Nicholas Road (EW) – #7
 - Install a traffic signal.
 - Restripe the southbound approach to provide one left turn and one shared left/through/right turn lane.

With implementation of the recommendations described below, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Ambient Plus Project Plus Cumulative conditions during the AM and PM peak hours.

The need for installation of a traffic signal at the intersection of Mauna Loa Road/Project Driveway and Jean Nicholas Road has been evaluated based on the California Manual on Uniform Traffic Control Devices, peak hour volume warrant (Warrant 3). The peak hour volume warrant graph is provided in Appendix E.

Cumulative Improvements and Project Fair Share Contributions

The proposed improvements at Intersection #4 are also identified in the Clinton Keith Road Extension Project Traffic Operations Analysis (LSA Associates, May 2015). Funding for improvements at Winchester Road [SR-79] and Max Gilliss Boulevard is available through development impact fees assessed to private development projects by the County of Riverside Road and Bridge Benefit District (RBBD) and the Western Riverside Council of Governments Transportation Uniform Mitigation Fee (TUMF) programs.

Installation of a traffic signal at the intersection of Mauna Loa Road/Project Driveway and Jean Nicholas Road is presumably not included in an established development impact fee program. Therefore, the project shall contribute toward the cost for improvements at this intersection on a fair share basis.

The following recommendations have been identified to address the project's share of cumulative Level of Service impacts:

Recommendation #2:

The project shall contribute to regional transportation improvements through participation in applicable development impact fee programs, including the County of Riverside Road and Bridge Benefit District (RBBD) and the Western Riverside Council of Governments Transportation Uniform Mitigation Fee (TUMF) programs.

Recommendation #3:

If the northeasterly adjacent property develops with the access easement through the project site, the project shall contribute its fair share of the cost for the following improvements:

- Mauna Loa Road/Project Driveway (NS) at Jean Nicholas Road (EW) – #7
 - Install a traffic signal.
 - Restripe the southbound approach to provide one left turn and one shared left/through/right turn lane.

With implementation of Recommendations #2 and #3, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Ambient Plus Project Plus Cumulative conditions during the AM and PM peak hours.

Table 7 shows the project fair share contributions at the study intersections where improvements are recommended for cumulative conditions. The project fair share is calculated based on the project share of new trips between existing and cumulative conditions.

Table 4
Existing Plus Project Intersection Levels of Service

Study Intersection	Traffic Control ¹	AM Peak Hour		PM Peak Hour	
		Delay ²	LOS ³	Delay	LOS
1. Winchester Rd at Whisper Heights/Pourroy Rd	TS	18.2	B	25.0	C
2. Winchester Rd at Jean Nicholas Rd/Skyview Rd	TS	24.4	C	19.8	B
3. Winchester Rd at Blue Spruce Ln/Algarve Ave	CSS	18.8	C	19.5	C
4. Winchester Rd at Max Gillis Blvd/Thompson Rd - With Improvements ⁴	TS	58.2	E	55.3	E
	TS	54.4	D	42.8	D
5. Winchester Rd at Benton Rd	TS	14.3	B	30.4	C
6. Leon Rd at Baxter Rd/Jean Nicholas Rd	TS	21.8	C	18.6	B
7. Mauna Loa Rd/Project Driveway at Jean Nicholas Rd	CSS	32.4	D	22.7	C
8. Project East Driveway at Jean Nicholas Rd	CSS	0.0	A	0.0	A

Notes:

- (1) TS = Traffic Signal; CSS = Cross Street Stop
- (2) Delay is shown in seconds/vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).
- (3) LOS = Level of Service
- (4) Restripe EB approach to provide a second left turn lane.

Table 5
Existing Plus Ambient Growth Plus Project Intersection Levels of Service

Study Intersection	Traffic Control ¹	AM Peak Hour		PM Peak Hour	
		Delay ²	LOS ³	Delay	LOS
1. Winchester Rd at Whisper Heights/Pourroy Rd	TS	19.1	B	26.4	C
2. Winchester Rd at Jean Nicholas Rd/Skyview Rd	TS	25.8	C	20.3	C
3. Winchester Rd at Blue Spruce Ln/Algarve Ave	CSS	19.8	C	20.5	C
4. Winchester Rd at Max Gillis Blvd/Thompson Rd - With Improvements ⁴	TS	67.1	E	62.2	E
	TS	54.9	D	37.4	D
5. Winchester Rd at Benton Rd	TS	15.1	B	35.3	D
6. Leon Rd at Baxter Rd/Jean Nicholas Rd	TS	22.2	C	18.7	B
7. Mauna Loa Rd/Project Driveway at Jean Nicholas Rd	CSS	34.7	D	23.7	C
8. Project East Driveway at Jean Nicholas Rd	CSS	0.0	A	0.0	A

Notes:

- (1) TS = Traffic Signal; CSS = Cross Street Stop
- (2) Delay is shown in seconds/vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).
- (3) LOS = Level of Service
- (4) Add second NB left turn lane and dedicated right turn lane; restripe EB approach to provide a second left turn lane.

Table 6
Existing Plus Ambient Growth Plus Project Plus Cumulative Intersection Levels of Service

Study Intersection	Traffic Control ¹	AM Peak Hour		PM Peak Hour	
		Delay ²	LOS ³	Delay	LOS
1. Winchester Rd at Whisper Heights/Pourroy Rd	TS	23.0	C	31.9	C
2. Winchester Rd at Jean Nicholas Rd/Skyview Rd	TS	35.1	D	30.3	C
3. Winchester Rd at Blue Spruce Ln/Algarve Ave	CSS	24.0	C	24.1	C
4. Winchester Rd at Max Gillis Blvd/Thompson Rd - With Improvements ⁴	TS	84.2	F	100.9	F
	TS	39.1	D	46.7	D
5. Winchester Rd at Benton Rd	TS	16.2	B	43.9	D
6. Leon Rd at Baxter Rd/Jean Nicholas Rd	TS	23.5	C	20.2	C
7. Mauna Loa Rd/Project Driveway at Jean Nicholas Rd - With Improvements ⁵	CSS	67.0	F	53.0	F
	TS	14.1	B	10.4	B
8. Project East Driveway at Jean Nicholas Rd	CSS	0.0	A	0.0	A

Notes:

- (1) TS = Traffic Signal; CSS = Cross Street Stop
- (2) Delay is shown in seconds/vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst
- (3) LOS = Level of Service
- (4) Add second NB left turn lane and dedicated right turn lane; add third SB through lane; restripe EB approach to provide a second left turn lane; add WB through lane.
- (5) Install a traffic signal and restripe the southbound approach to provide one left turn lane and one shared left/through/right turn lane.

Table 7
Project Fair Share Contribution

Study Intersection	Peak Hour	Intersection Turning Movement Volumes				
		Existing	Existing Plus Ambient Plus Project Plus Cumulative	Project Trips	Total New Trips	Project Share of Total New Trips
4. Winchester Rd at Max Gillis Blvd/Thompson Rd	AM	4,118	4,684	85	566	15.0%
	PM	4,669	5,435	65	766	8.5%
7. Mauna Loa Rd/Project Driveway at Jean Nicholas Rd	AM	520	1,107	403	587	68.7%
	PM	511	1,060	288	549	52.5%

7. SITE ACCESS & CIRCULATION

The project proposes to provide one full access driveway at Jean Nicholas Road to be aligned with the Mauna Loa Road intersection and one inbound only access at Jean Nicholas Road. The project site also provides an access easement to/from the property to the north.

PROJECT DESIGN FEATURES

This analysis assumes the following improvements will be constructed by the project to provide project site access:

Mauna Load Road/Project Driveway (NS) at Jean Nicholas Road (EW) - #7

- Construct the project driveway to provide two inbound lanes and two outbound lanes with southbound stop-control. The new southbound lanes at the Project Driveway shall provide one dedicated left turn lane and a shared through/right turn lane.
- Restripe the eastbound approach to provide one left turn lane.
- Construct the westbound approach to provide one through lane and one shared through/right turn lane.

Project East Driveway (NS) at Jean Nicholas Road (EW) - #8

- Construct the project driveway to provide one inbound lane only.
- Construct the westbound approach to provide one through lane and one shared through/right turn lane.

This analysis also assumes the project shall comply with the following conditions as part of the County of Riverside standard Conditions of Approval:

- All roadway design, traffic signing and striping, and traffic control improvements relating to the proposed project should be constructed in accordance with applicable engineering standards and to the satisfaction of the County of Riverside Transportation & Land Management Department.
- Site-adjacent roadways should be constructed or repaired at their ultimate half-section width, including landscaping and parkway improvements in conjunction with development, or as otherwise required by the County of Riverside Transportation & Land Management Department.
- On-site traffic signing and striping plans should be submitted for County of Riverside approval in conjunction with detailed construction plans for the project.
- Off-street parking should be provided to meet County of Riverside Municipal Code requirements.
- The final grading, landscaping, and street improvement plans should demonstrate that sight distance standards are met in accordance with applicable County of Riverside/California Department of Transportation sight distance standards.

QUEUING ANALYSIS

A turn pocket queuing analysis has been conducted along Jean Nicholas Road for Existing Plus Ambient Plus Project Plus Cumulative conditions. To provide a conservative estimate, the 95th percentile queue was used to calculate required storage lengths.

Typically when an exclusive left turn lane is required, a minimum of 2 passenger cars should be provided at 25 feet per vehicle (50 feet minimum storage length). Where possible, the recommended minimum pocket length used on roadways should be 100 feet where the speed is 30 miles per hour and 150 feet for arterials with speeds of 40 miles per hour or more. The recommended maximum single turn storage length shall be

300 feet; therefore, dual left turn lanes should be used when over 300 feet of storage is required or when necessary to provide acceptable levels of service at the intersection. For local streets and driveways, smaller storage lengths are permitted when volumes permit.

Table 8 summarizes results of the queuing analyses for turning movements conducted at the primary project access along Jean Nicholas Road. The values represent the projected queue length necessary for satisfactory operations. It is recommended that the ultimate turn bay length exceed the projected queue length. The queue lengths are based on the Highway Capacity Manual methodology and obtained from the 95th-percentile queue lengths reported on the Level of Service worksheets (see Appendix D). As shown in Table 8, adequate storage is forecast to be provided, with exception of the southbound approach exiting the project site at the primary driveway. To ensure vehicle queues for the southbound approach do not obstruct inbound project trips, the following recommendation is provided:

- Install "Do Not Block" pavement markings and signage at the internal project site intersection created between the primary access driveway and the car wash/gas station drive aisles.

TRUCK ACCESS POINTS AND TURNING TEMPLATES

Figure 32 shows the truck access points and turning templates. Truck turning templates are provided for both inbound and outbound truck turning movements on Jean Nicholas Road. As shown on Figure 32, inbound trucks servicing the super convenience market/gas station will enter the East Project Driveway heading westbound on Jean Nicholas Road. Trucks will then dispense fuel into the storage tanks and exit the project site at the Mauna Loa Road/Project Driveway at Jean Nicholas Road, where they will proceed eastbound to the signalized intersection at Winchester Road (SR-79).

Table 8
Mauna Loa Road/Project Driveway at Jean Nicholas Road Queueing Analysis

Scenario	Turning Movement	95th-Percentile Queue Length (Feet) ¹		Storage Length (Feet)	Adequate Storage?
		AM Peak Hour	PM Peak Hour		
Existing Plus Ambient Plus Project (Unsignalized)	SB Left	97.7	50.3	100	Yes
	SB Through/Right	10.3	7.1	100	Yes
	EB Left	5.7	3.8	100	Yes
	WB Left	1.8	3.2	100	Yes
Existing Plus Ambient Plus Project Plus Cumulative (Signalized)	SB Left	111.1	78.0	100	No ²
	SB Left/Thru/Right	104.4	74.6	100	No ²
	EB Left	27.6	21.8	100	Yes
	WB Left	7.9	10.6	100	Yes
	WB Through/Right	44.2	31.7	380	Yes

Notes:

(1) Queueing analysis based on 95th-Percentile Queue Length (see Appendix D).

(2) Install "Do Not Block" pavement markings and signage at the internal project site intersection created between the primary access driveway and the car wash/gas station drive aisles.



Legend
 ----- Proposed Striping



Figure 32
Truck Turning Template

8. CONCLUSIONS

INTERSECTION LEVELS OF SERVICE

Table 9 shows a summary of the study intersection Levels of Service for the scenarios evaluated. As shown in Table 9, the study intersections are forecast to operate within acceptable Levels of Service during the AM and PM peak hours for the scenario evaluated with improvements.

RECOMMENDATIONS

The following recommendation has been identified to address the project impact for Existing Plus Project conditions.

Recommendation #1:

Prior to project occupancy, the following improvement shall be implemented:

- Winchester Road [SR-79] (NS) at Max Gilliss Boulevard/Thompson Road (EW) – #4
 - Eastbound: Restripe to provide a second left turn lane.

With implementation of Recommendation #1, the proposed project is forecast to result in no Level of Service impacts at the study intersections for Existing Plus Project conditions during the AM and PM peak hours.

The following recommendations have been identified to address the project's share of cumulative impacts.

Recommendation #2:

The project shall contribute to regional transportation improvements through participation in applicable development impact fee programs, including the County of Riverside Road and Bridge Benefit District (RBBD) and the Western Riverside Council of Governments Transportation Uniform Mitigation Fee (TUMF) programs.

Recommendation #3:

If the northeasterly adjacent property develops with the access easement through the project site, the project shall contribute its fair share of the cost for the following improvements:

- Mauna Loa Road/Project Driveway (NS) at Jean Nicholas Road (EW) – #7
 - Install a traffic signal.
 - Restripe the southbound approach to provide one left turn and one shared left/through/right turn lane.

OTHER RECOMMENDATIONS

To ensure vehicle queues for the southbound approach do not obstruct inbound project trips, the following recommendation is provided:

- Install "Do Not Block" pavement markings and signage at the internal project site intersection created between the primary access driveway and the car wash/gas station drive aisles.

Table 9
Summary of Intersection Levels of Service

Study Intersection	Peak Hour Delay-LOS ¹							
	Existing		Existing Plus Project		Existing Plus Ambient Plus Project		Existing Plus Ambient Plus Project Plus Cumulative	
	AM	PM	AM	PM	AM	PM	AM	PM
1. Winchester Rd at Whisper Heights/Pourroy Rd	18.1-B	24.8-C	18.2-B	25.0-C	19.1-B	26.4-C	23.0-C	31.9-C
2. Winchester Rd at Jean Nicholas Rd/Skyview Rd	13.2-B	13.7-B	24.4-C	19.8-B	25.8-C	20.3-C	35.1-D	30.3-C
3. Winchester Rd at Blue Spruce Ln/Algarve Ave	18.1-C	18.4-B	18.8-C	19.5-C	19.8-C	20.5-C	24.0-C	24.1-C
4. Winchester Rd at Max Gillis Blvd/Thompson Rd	55.2-E	53.4-D	58.2-E	55.3-E	67.1-E	62.2-E	84.2-F	100.9-F
- With Improvements	-	-	54.4-D	42.8-D	54.9-D	37.4-D	39.1-D	46.7-D
5. Winchester Rd at Benton Rd	13.9-B	29.5-C	14.3-B	30.4-C	15.1-B	35.3-D	16.2-B	43.9-D
6. Leon Rd at Baxter Rd/Jean Nicholas Rd	20.8-C	18.0-B	21.8-C	18.6-B	22.2-C	18.7-B	23.5-C	20.2-C
7. Mauna Loa Rd/Project Dwy at Jean Nicholas Rd	13.8-B	14.1-B	32.4-D	22.7-C	34.7-D	23.7-C	67.0-F	53.0-F
- With Improvements	-	-	-	-	-	-	14.1-B	10.4-B
8. Project East Dwy at Jean Nicholas Rd	-	-	0.0-A	0.0-A	0.0-A	0.0-A	0.0-A	0.0-A

Notes:

(1) Delay shown in seconds per vehicle; LOS = Level of Service.

APPENDICES

Appendix A Glossary

Appendix B Scoping Agreement

Appendix C Intersection Turning Movement Counts and Adjustment Worksheets

Appendix D Level of Service Worksheets

Appendix E Traffic Signal Warrant Worksheet

APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

SCOPING AGREEMENT

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the Riverside County Transportation Department requirements for traffic impact analysis of the following project. The analysis must follow the Riverside County Transportation Department Traffic Study Guidelines dated April 2008.

Case No. CUP200002

Related Cases -

SP No. _____

EIR No. _____

GPA No. _____

CZ No. _____

Project Name: Winchester at Jean Nicholas Commercial Retail Center

Project Address: Northwest corner of Winchester Road (SR-79) and Jean Nicholas Road

Project Description: 2,627 ft coffee shop with drive-thru and a 16 fp super convenience market/gas station

	Consultant	Developer
Name:	Ganddini Group, Inc./ Bryan Crawford	Aziz, LLC / Amir Aziz
Address:	550 Parkcenter Dr. Suite 202 Santa Ana, Ca 92705	495 East Rincon Street, Suite 175 Corona, CA 92879
Telephone:	714-795-3100 ext 104	951-987-0434
Fax:	bryan@ganddini.com	mamoilinc@gmail.com

A. Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation, 10th Edition, 2017

Current GP Land Use			Proposed Land Use				
Current Zoning	Light Industrial (LI)	Industrial Park (I-P)	Proposed Zoning	Light Industrial (LI)	Industrial Park (I-P)		
Current Trip Generation	In	Out	Total	Proposed Trip Generation	In	Out	Total
AM Trips	-	-	-	146	144	290	
PM Trips	-	-	-	109	109	218	
Internal Trip Allowance	☐ Yes	☐ No	(_____ % Trip Discount)				
Pass-By Trip Allowance	☒ Yes	☒ No	(See Table 1 % Trip Discount)				

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: N % S % E % W %
(attach exhibit for detailed assignment) See Figures 3 and 4

C. Background Traffic

Project Build-out Year: 2022 Annual Ambient Growth Rate: 2.0 %

Phase Year(s) _____

Other area projects to be analyzed: Please provide cumulative data. Cumulative data for City of Murrieta will be acquired

Model/Forecast methodology Manual build up approach

Exhibit B – Scoping Agreement – Page 2

D. Study intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|--|---|
| 1. Winchester Road (SR-79) (NS) at Pourroy Rd (EW) | 6. Leon Rd (NS) at Jean Nicholas Rd (EW) |
| 2. Winchester Road (SR-79) (NS) at Skyview Rd (EW) | 7. Mauna Loa/Project Dwy (NS) at Jean Nicholas Rd |
| 3. Winchester Road (SR-79)(NS) at Algarve Ave (EW) | 8. Proect East Dwy (NS) at Jean Nicholas Rd (EW) |
| 4. Winchester Road (SR-79)(NS) at Thompson Rd (EW) | 9. _____ |
| 5. Winchester Road (SR-79)(NS) at Benton Rd (EW) | 10. _____ |

E. Study Roadway Segments: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

E. Other Jurisdictional Impacts

Is this project within a City’s Sphere of Influence or one-mile radius of City boundaries? ☒ Yes ☐ No

If so, name of City Jurisdiction: City of Murrieta

F. Site Plan (please attach reduced copy) See Fi gure 2

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Transportation Department)

(NOTE: If the traffic study states that “a traffic signal is warranted” (or “a traffic signal appears to be warranted,” or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

Queuing analysis for the project driveways.

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.

Date of counts September 2019 and New Counts

***NOTE* Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Transportation Department staff will not process the Scoping Agreement prior to receipt of the fee.**

Recommended by:

Bryan Crawford 12/20/2019
Consultant’s Representative Date

Scoping Agreement Submitted on 1-22-2020

Revised on 4-14-2020

Approved Scoping Agreement:

Riverside County Transportation _____
Department Date

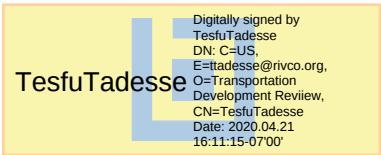


Table 1
Project Trip Generation

Trip Generation Rates									
Land Use	Source ¹	Units ²	AM Peak Hour			PM Peak Hour			Daily Rate
			% In	% Out	Rate	% In	% Out	Rate	
Coffee Shop with Drive-Thru	ITE 937	TSF	51%	49%	88.99	50%	50%	43.38	820.38
Super Convenience Market/Gas Station	ITE 960	FP	50%	50%	28.08	50%	50%	22.96	230.52

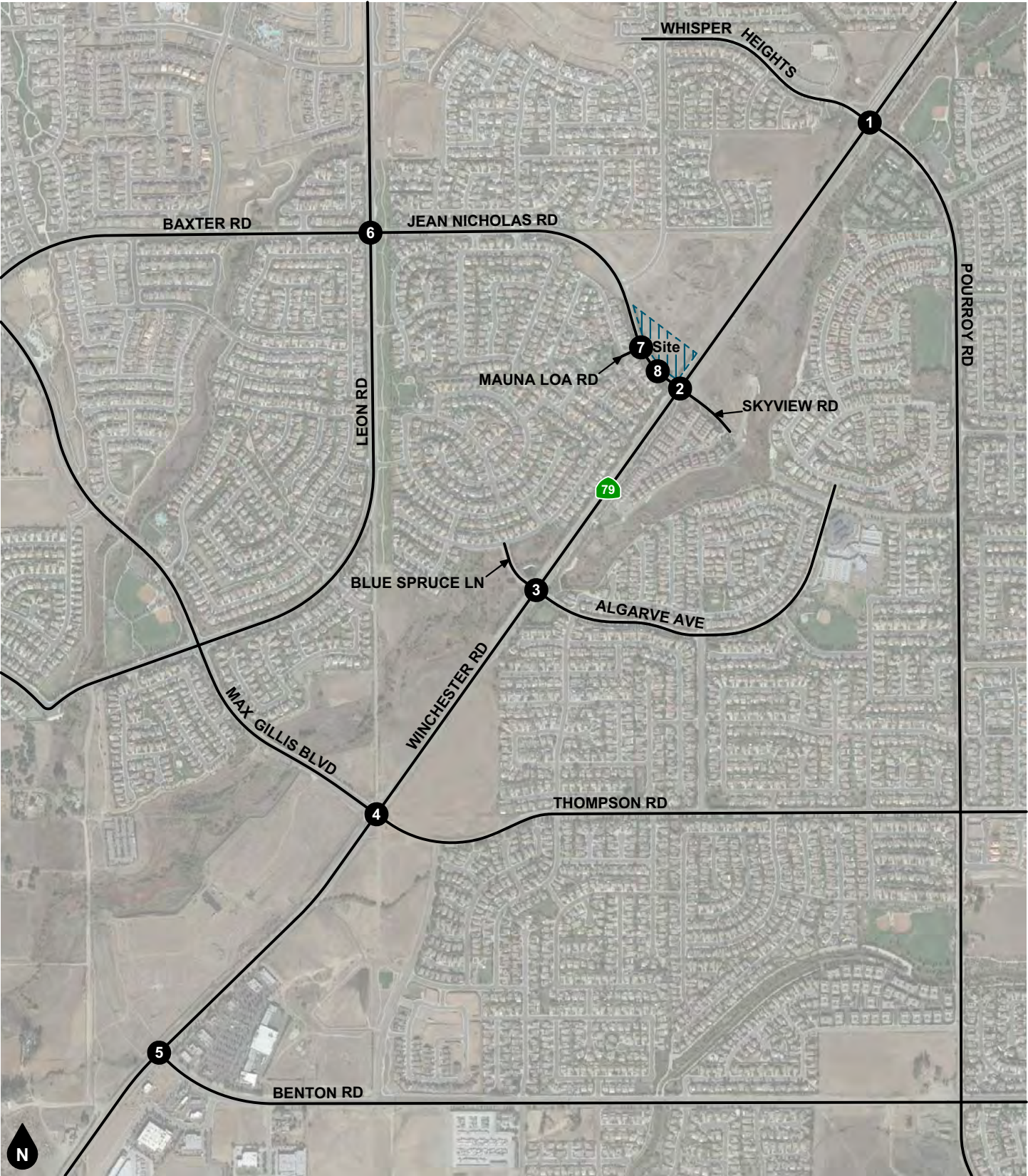
Trips Generated									
Land Use	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Coffee Shop with Drive-Thru	2,627	TSF	119	115	234	57	57	114	2,155
- Pass-By Reduction (49% AM, 50% PM)			-58	-56	-114	-29	-29	-58	-172
Super Convenience Market/Gas Station	16	FP	225	225	450	184	184	368	3,688
- Pass-By Reduction (62% AM, 56% PM)			-140	-140	-280	-103	-103	-206	-486
Total			146	144	290	109	109	218	5,185

Notes:

(1) ITE = Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017; XXX= Land Use Code

(2) TSF = Thousand Square Feet; VFP = Vehicle Fueling Positions

(3) Institute of Transportation Engineer, Trip Generation Handbook, 3rd Edition, 2017. In the absense of pass-by data for ITE 937 and 960, the pass-by rates for ITE 934 (Fast-Food Restaurant with Drive-Through) and 945 (Gasoline/Service Station with Convenience Market) were utilized as they are similar and comparable land uses.



Legend
Study Intersection

Figure 1
Project Location Map



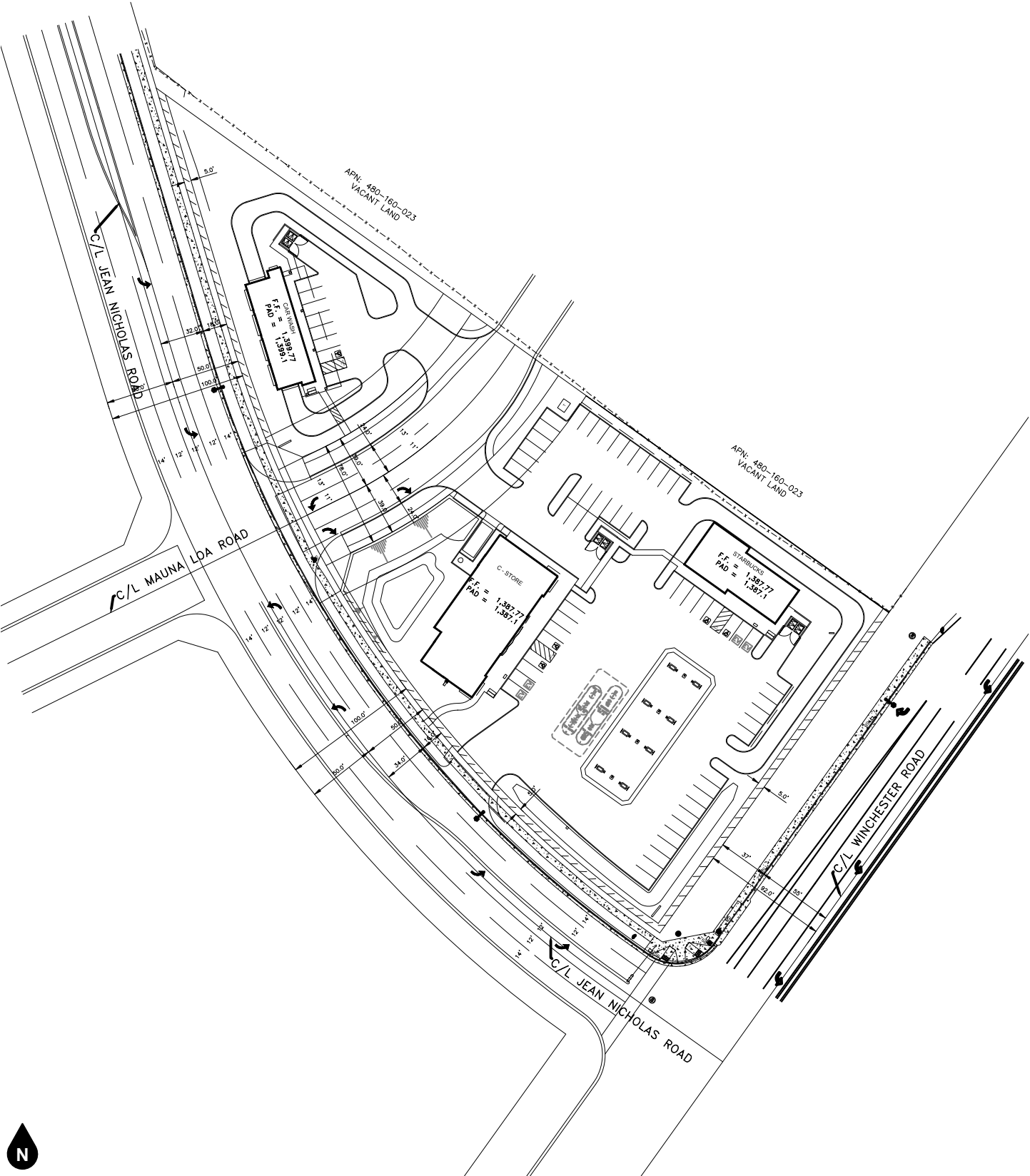


Figure 2
Site Plan

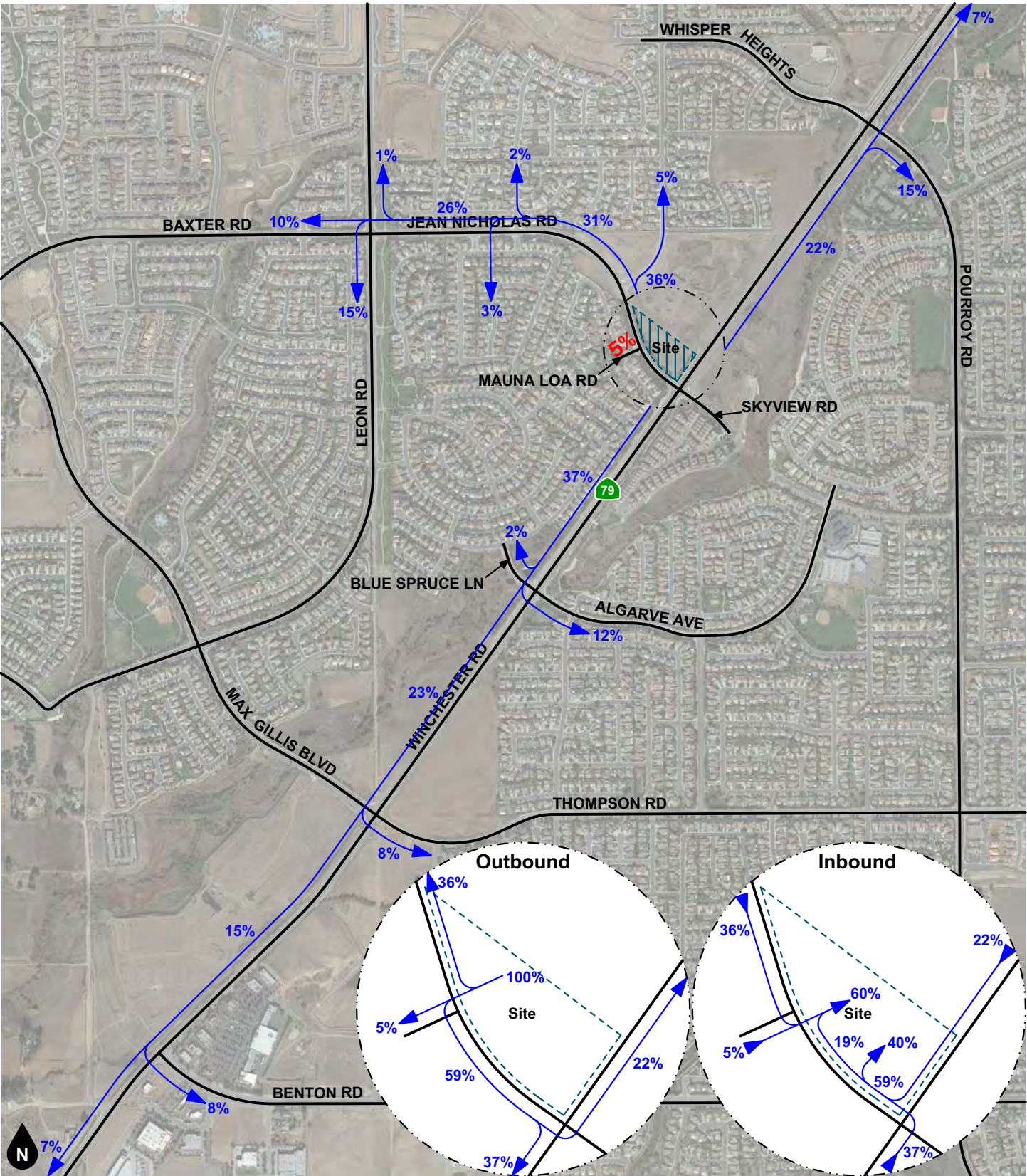
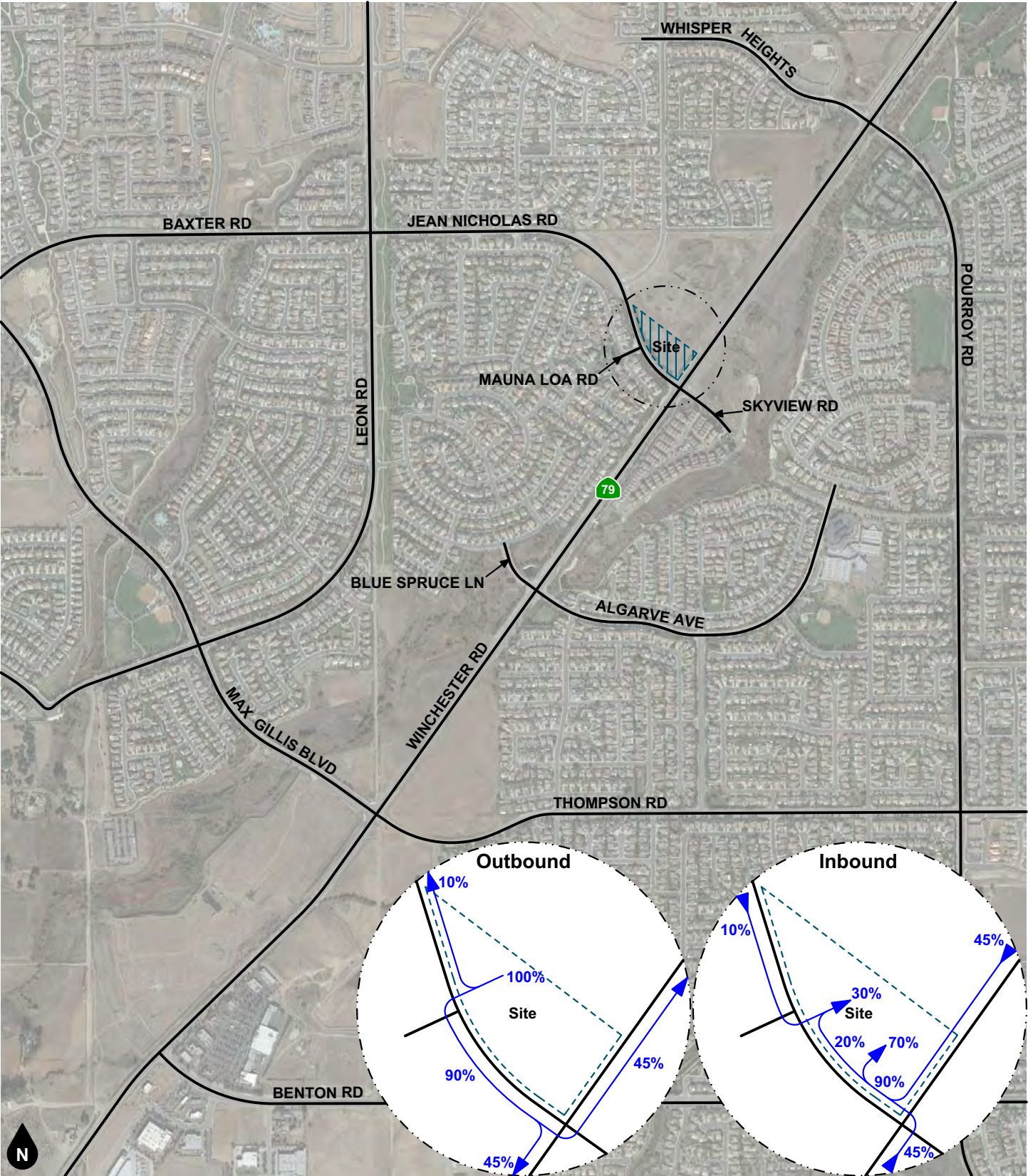


Figure 3
Project Trip Distribution



Legend
10% Percent To/From Project

Figure 4
Project Pass-By Trip Distribution

APPENDIX C

**INTERSECTION TURNING MOVEMENT COUNTS
AND ADJUSTMENT WORKSHEETS**

AM Peak Hour Counts (April 2020)

				Leon Rd at Jean Nicholas Rd								Mauna Loa Rd at Jean Nicholas Rd								Winchester Rd at Jean Nicholas Rd												
				115 91 v ^								0 0 v ^								750 337 v ^												
				Segment								Segment								Segment												
				4 88 23 < v >								0 0 0 < v >								26 722 2 < v >												
Segment < 21 > 29	2 14	^ > v	Int #: 6 Total: 320				^ v	38 14	Segment < 100	Diff. 36	Segment < 64	66 0	^ v	Int #: 7 Total: 144	^ v	0 57	Segment < 63	Diff. 5	Segment < 58	31 3	^ v	Int #: 2 Total: 1,186	^ v	4 13	Segment < 20 > 13							
				< ^ > 3 51 22								< ^ > 7 0 8								< ^ > 29 302 8												
				Segment v ^ 149 76								Segment v ^ 6 15								Segment v ^ 778 339												
																				Difference 1 1												
																				Winchester Rd at Blue Spruce/Algarve 777 340 v ^												
																				Segment 2 775 0 < v >												
																				Segment < 2 > 20				0 20	^ v	Int #: 3 Total: 1,153				^ v	19 0	Segment < 19 > 16
																								< ^ > 0 321 16								
																								Segment v ^ 795 337								

PM Peak Hour Counts (April 2020)

			Leon Rd at Jean Nicholas Rd 128 138 v ^ Segment 2 84 42 ^ v ^						Mauna Loa Rd at Jean Nicholas Rd 0 0 v ^ Segment 0 0 0 ^ v ^						Winchester Rd at Jean Nicholas Rd 534 850 v ^ Segment 38 493 3 ^ v ^																						
Segment < 50 > 45	3 18 > 24	^ > v	Int #: 6 Total: 502			^ v	35 28 > 46	Segment < 109 > 160	Diff. 23 36	Segment < 132 > 124	0 116 8	^ v	Int #: 7 Total: 287			^ v	0 127 25	Segment < 152 > 122	Diff. 8 20	Segment < 160 > 102	55 3 44	^ v	Int #: 2 Total: 1,586			^ v	5 4 11	Segment < 20 > 28									
			^ ^ ^ 20 100 100 Segment v ^ 154 220																								Winchester Rd at Blue Spruce/Algarve 557 911 v ^ Segment 6 551 0 ^ v ^										
																											Segment < 6 > 24			0 0 24	^ v	Int #: 3 Total: 1,580			^ v	20 0 0	Segment < 20 > 88
																														^ ^ ^ 0 891 88 Segment v ^ 575 979							

PM Peak Hour Manual Adjustment

[illegible]

Adjusted PM Peak Hour (Pre-Pandemic)

										Leon Rd at Jean Nicholas Rd								Mauna Loa Rd at Jean Nicholas Rd								Winchester Rd at Jean Nicholas Rd				* This intersection was counted in Sep 2015							
										223 247 v ^								0 0 v ^								1,000 1,513 v ^											
										Segment								Segment								Segment											
										4 149 70 v ^												0 0 0 v ^								66 928 6 v ^							
Segment < 89 30 > > 75 40 v										Int #: 6 Total: 878				^ 65 Segment Diff. Segment 0 ^ < 52 < 203 44 < 247 194 >				Int #: 7 Total: 511				^ 0 Segment Diff. Segment 88 ^ < 238 < 285 15 < 300 9 >				Int #: 2 Total: 2,866				^ 3 Segment < 4 < 18 v 11 > 40							
										< ^ > 33 177 167								< ^ > 9 0 10								< ^ > 230 1,422 25											
										Segment v ^								Segment v ^								Segment v ^											
										275 377								60 19								1,013 1,677											
																						Difference 17 34															
																						Winchester Rd at Blue Spruce/Algarve															
																						1,030 1,643 v ^															
																						Segment 11 1,019 0 v ^															
																						Int #: 3 Total: 2,876				^ 36 Segment < 0 < 36 v 0 > 159											
																						< ^ > 0 1,607 159															
																						Segment v ^															
																						1,063 1,766															

INTERSECTION TURNING MOVEMENT COUNTS

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

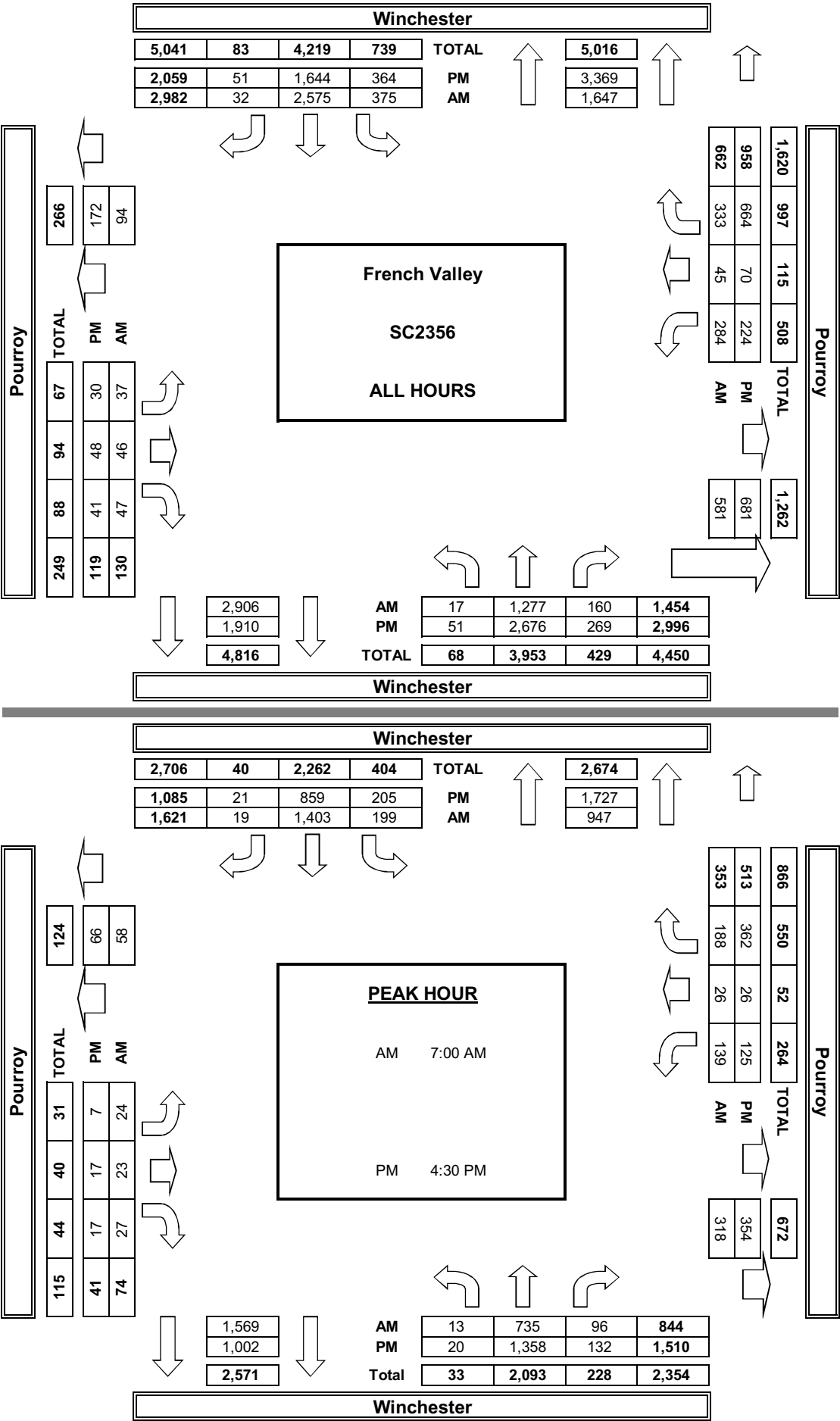
DATE: Wed, Sep 18, 19	LOCATION: NORTH & SOUTH: EAST & WEST:	French Valley Winchester Pourroy	PROJECT #: LOCATION #: CONTROL:	SC2356 4 SIGNAL
---------------------------------	--	--	--	-----------------------

NOTES:	AM PM MD OTHER OTHER	◀ W S ▶ E	▲ N S ▼
--------	----------------------------------	-----------------	---------------

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Winchester			Winchester			Pourroy			Pourroy			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	2	1	2	2	1	1	1	1	1	1	1	

AM	7:00 AM	3	185	18	35	330	3	0	4	0	45	5	33	661
	7:15 AM	6	200	29	48	355	5	3	9	3	32	10	61	761
	7:30 AM	4	176	26	55	350	3	11	4	14	28	7	53	731
	7:45 AM	0	174	23	61	368	8	10	6	10	34	4	41	739
	8:00 AM	1	114	11	42	337	4	8	12	12	39	7	32	619
	8:15 AM	2	145	18	62	321	2	1	7	0	24	2	35	619
	8:30 AM	0	154	19	44	264	6	2	2	4	35	5	29	564
	8:45 AM	1	129	16	28	250	1	2	2	4	47	5	49	534
	VOLUMES	17	1,277	160	375	2,575	32	37	46	47	284	45	333	5,228
	APPROACH %	1%	88%	11%	13%	86%	1%	28%	35%	36%	43%	7%	50%	
	APP/DEPART	1,454	/	1,647	2,982	/	2,906	130	/	581	662	/	94	0
PM	BEGIN PEAK HR	7:00 AM												
	VOLUMES	13	735	96	199	1,403	19	24	23	27	139	26	188	2,892
	APPROACH %	2%	87%	11%	12%	87%	1%	32%	31%	36%	39%	7%	53%	
	PEAK HR FACTOR	0.898			0.927			0.638			0.857			0.950
	APP/DEPART	844	/	947	1,621	/	1,569	74	/	318	353	/	58	0
	4:00 PM	4	361	29	37	214	7	3	2	5	20	7	81	770
	4:15 PM	17	306	25	38	190	13	2	9	5	22	19	78	724
	4:30 PM	6	328	22	49	232	8	3	5	8	27	12	92	792
	4:45 PM	3	337	34	62	213	6	2	2	2	23	5	92	781
	5:00 PM	4	344	38	49	212	4	1	3	3	31	3	94	786
	5:15 PM	7	349	38	45	202	3	1	7	4	44	6	84	790
	5:30 PM	6	340	33	46	203	6	4	4	1	30	12	65	750
	5:45 PM	4	311	50	38	178	4	14	16	13	27	6	78	739
	VOLUMES	51	2,676	269	364	1,644	51	30	48	41	224	70	664	6,132
	APPROACH %	2%	89%	9%	18%	80%	2%	25%	40%	34%	23%	7%	69%	
	APP/DEPART	2,996	/	3,369	2,059	/	1,910	119	/	681	958	/	172	0
	BEGIN PEAK HR	4:30 PM												
	VOLUMES	20	1,358	132	205	859	21	7	17	17	125	26	362	3,149
	APPROACH %	1%	90%	9%	19%	79%	2%	17%	41%	41%	24%	5%	71%	
	PEAK HR FACTOR	0.958			0.939			0.641			0.957			0.994
	APP/DEPART	1,510	/	1,727	1,085	/	1,002	41	/	354	513	/	66	0

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

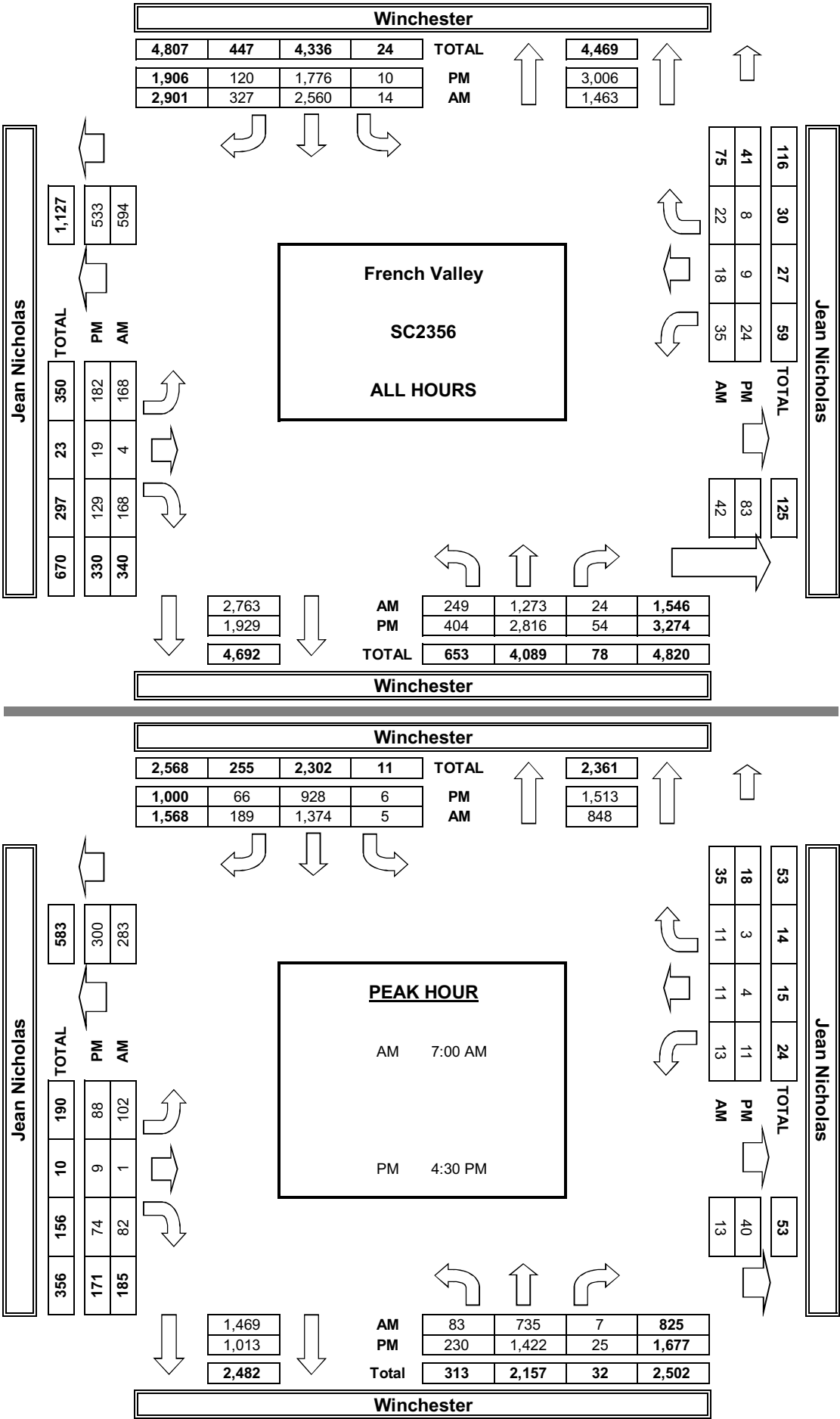
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Sep 18, 19	LOCATION: NORTH & SOUTH: EAST & WEST:	French Valley Winchester Jean Nicholas	PROJECT #: LOCATION #: CONTROL:	SC2356 3 SIGNAL
NOTES:			AM PM MD OTHER OTHER	▲ N ◀ W E ▶ S ▼

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Winchester			Winchester			Jean Nicholas			Jean Nicholas			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	2	1	1	2	1	1	2	0	1	1	1	

AM	7:00 AM	14	185	3	1	337	37	22	0	14	4	1	1	619
	7:15 AM	18	206	2	0	356	33	27	1	23	2	3	3	674
	7:30 AM	31	177	1	1	334	57	26	0	20	4	4	4	659
	7:45 AM	20	167	1	3	347	62	27	0	25	3	3	3	661
	8:00 AM	28	111	3	1	323	63	17	0	28	4	2	0	580
	8:15 AM	31	143	3	0	321	23	21	1	11	4	3	2	563
	8:30 AM	60	148	3	2	268	32	18	1	23	6	0	7	568
	8:45 AM	47	136	8	6	274	20	10	1	24	8	2	2	538
	VOLUMES	249	1,273	24	14	2,560	327	168	4	168	35	18	22	4,862
	APPROACH %	16%	82%	2%	0%	88%	11%	49%	1%	49%	47%	24%	29%	
	APP/DEPART	1,546	/	1,463	2,901	/	2,763	340	/	42	75	/	594	0
PM	BEGIN PEAK HR	7:00 AM			5	1,374	189	102	1	82	13	11	11	2,613
	VOLUMES	83	735	7	0%	88%	12%	55%	1%	44%	37%	31%	31%	
	APPROACH %	10%	89%	1%										
	PEAK HR FACTOR		0.913			0.951			0.889			0.729		0.969
	APP/DEPART	825	/	848	1,568	/	1,469	185	/	13	35	/	283	0
	4:00 PM	40	371	4	1	225	13	22	3	15	2	1	1	698
	4:15 PM	26	324	10	1	210	6	24	2	14	4	2	2	625
	4:30 PM	49	336	7	1	250	15	19	1	19	2	2	1	702
	4:45 PM	57	359	6	0	221	17	17	1	16	5	0	0	699
	5:00 PM	74	365	4	3	231	11	21	3	15	2	0	1	730
	5:15 PM	50	362	8	2	226	23	31	4	24	2	2	1	735
	5:30 PM	51	361	9	1	215	17	20	0	13	5	1	1	694
	5:45 PM	57	338	6	1	198	18	28	5	13	2	1	1	668
	VOLUMES	404	2,816	54	10	1,776	120	182	19	129	24	9	8	5,551
	APPROACH %	12%	86%	2%	1%	93%	6%	55%	6%	39%	59%	22%	20%	
	APP/DEPART	3,274	/	3,006	1,906	/	1,929	330	/	83	41	/	533	0
	BEGIN PEAK HR	4:30 PM			6	928	66	88	9	74	11	4	3	2,866
	VOLUMES	230	1,422	25	1%	93%	7%	51%	5%	43%	61%	22%	17%	
	APPROACH %	14%	85%	1%										
	PEAK HR FACTOR		0.946			0.940			0.725			0.900		0.975
	APP/DEPART	1,677	/	1,513	1,000	/	1,013	171	/	40	18	/	300	0

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

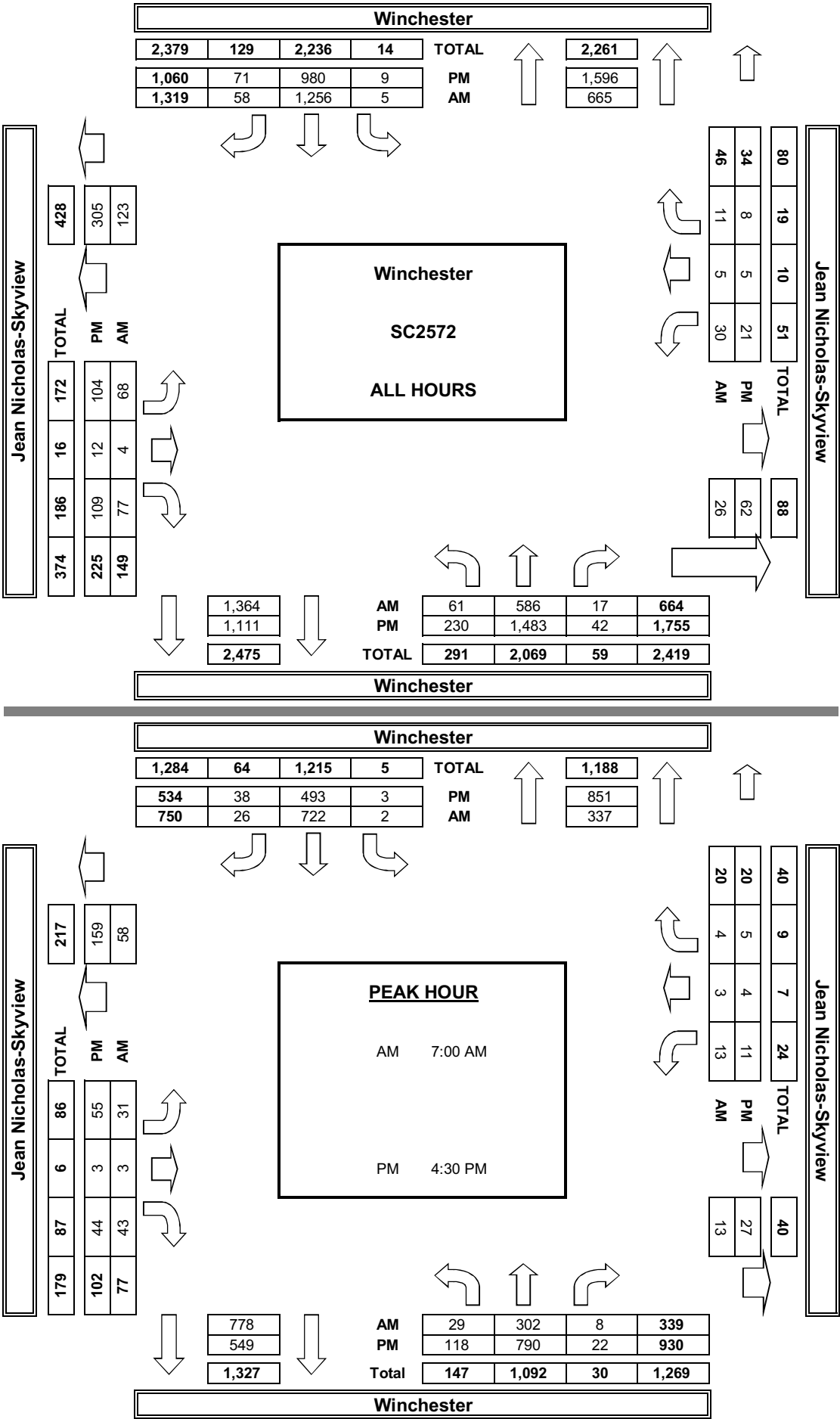
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Apr 22, 20	LOCATION: NORTH & SOUTH: Winchester EAST & WEST: Jean Nicholas	PROJECT #: SC2572 LOCATION #: 3 CONTROL: SIGNAL
NOTES:		

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Winchester			Winchester			Jean Nicholas-Skyview			Jean Nicholas-Skyview			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL

AM	7:00 AM	4	70	2	0	167	8	5	1	12	4	3	2	278
	7:15 AM	7	75	3	2	160	5	12	0	11	1	0	0	276
	7:30 AM	9	78	3	0	217	7	7	2	11	4	0	1	339
	7:45 AM	9	79	0	0	178	6	7	0	9	4	0	1	293
	8:00 AM	7	67	3	0	125	12	6	0	10	2	1	3	236
	8:15 AM	9	64	3	1	136	8	5	0	9	4	1	1	241
	8:30 AM	4	74	2	2	139	4	12	1	9	6	0	2	255
	8:45 AM	12	79	1	0	134	8	14	0	6	5	0	1	260
	VOLUMES	61	586	17	5	1,256	58	68	4	77	30	5	11	2,178
	APPROACH %	9%	88%	3%	0%	95%	4%	46%	3%	52%	65%	11%	24%	
	APP/DEPART	664	/	665	1,319	/	1,364	149	/	26	46	/	123	0
PM	BEGIN PEAK HR	7:00 AM												
	VOLUMES	29	302	8	2	722	26	31	3	43	13	3	4	1,186
	APPROACH %	9%	89%	2%	0%	96%	3%	40%	4%	56%	65%	15%	20%	
	PEAK HR FACTOR	0.942			0.837			0.837			0.556			0.875
	APP/DEPART	339	/	337	750	/	778	77	/	13	20	/	58	0
	4:00 PM	23	213	4	1	122	7	6	1	16	0	1	0	394
	4:15 PM	31	179	5	2	132	8	18	5	17	3	0	0	400
	4:30 PM	37	169	7	1	122	8	17	1	9	2	0	0	373
	4:45 PM	29	193	3	2	129	10	18	2	11	2	0	1	400
	5:00 PM	28	212	4	0	114	4	7	0	14	4	1	3	391
	5:15 PM	24	216	8	0	128	16	13	0	10	3	3	1	422
PM	5:30 PM	23	165	5	1	124	8	8	1	14	3	0	1	353
	5:45 PM	35	136	6	2	109	10	17	2	18	4	0	2	341
	VOLUMES	230	1,483	42	9	980	71	104	12	109	21	5	8	3,074
	APPROACH %	13%	85%	2%	1%	92%	7%	46%	5%	48%	62%	15%	24%	
	APP/DEPART	1,755	/	1,596	1,060	/	1,111	225	/	62	34	/	305	0
	BEGIN PEAK HR	4:30 PM												
	VOLUMES	118	790	22	3	493	38	55	3	44	11	4	5	1,586
	APPROACH %	13%	85%	2%	1%	92%	7%	54%	3%	43%	55%	20%	25%	
	PEAK HR FACTOR	0.938			0.927			0.823			0.625			0.940
	APP/DEPART	930	/	851	534	/	549	102	/	27	20	/	159	0

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

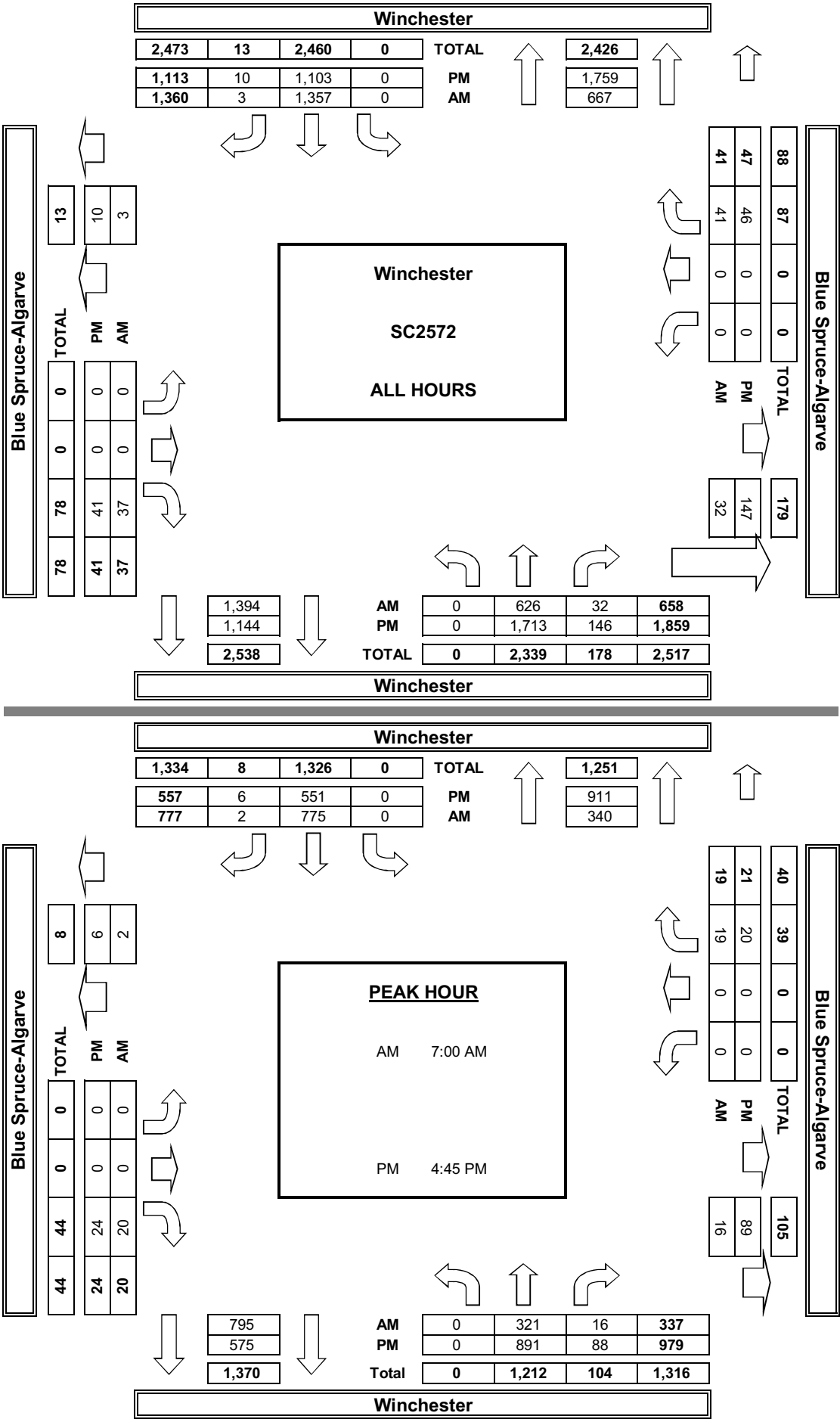
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Apr 22, 20	LOCATION: NORTH & SOUTH: EAST & WEST:	Winchester Winchester Blue Spruce	PROJECT #: LOCATION #: CONTROL:	SC2572 4 STOP E/W
NOTES:			AM PM MD OTHER OTHER ▲ ◀ W S ▼ N E ▶	

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Winchester			Winchester			Blue Spruce-Algarve			Blue Spruce-Algarve			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL

AM	7:00 AM	0	69	4	0	181	0	0	0	3	0	0	4	261
	7:15 AM	0	87	3	0	175	0	0	0	7	0	0	9	281
	7:30 AM	0	75	6	0	231	1	0	0	7	0	0	4	324
	7:45 AM	0	90	3	0	188	1	0	0	3	0	0	2	287
	8:00 AM	0	79	2	0	135	1	0	0	6	0	0	11	234
	8:15 AM	0	66	2	0	148	0	0	0	2	0	0	2	220
	8:30 AM	0	76	10	0	152	0	0	0	7	0	0	1	246
	8:45 AM	0	84	2	0	147	0	0	0	2	0	0	8	243
	VOLUMES	0	626	32	0	1,357	3	0	0	37	0	0	41	2,096
	APPROACH %	0%	95%	5%	0%	100%	0%	0%	0%	100%	0%	0%	100%	
	APP/DEPART	658	/	667	1,360	/	1,394	37	/	32	41	/	3	0
	BEGIN PEAK HR	7:00 AM												
PM	VOLUMES	0	321	16	0	775	2	0	0	20	0	0	19	1,153
	APPROACH %	0%	95%	5%	0%	100%	0%	0%	0%	100%	0%	0%	100%	
	PEAK HR FACTOR	0.906			0.837			0.714			0.528			0.890
	APP/DEPART	337	/	340	777	/	795	20	/	16	19	/	2	0
	4:00 PM	0	238	12	0	138	2	0	0	3	0	0	10	403
	4:15 PM	0	198	9	0	151	0	0	0	6	0	0	1	365
	4:30 PM	0	203	18	0	131	0	0	0	3	0	0	7	362
	4:45 PM	0	223	25	0	142	0	0	0	4	0	0	7	401
	5:00 PM	0	252	22	0	130	2	0	0	7	0	0	3	416
	5:15 PM	0	217	19	0	144	0	0	0	8	0	0	4	392
	5:30 PM	0	199	22	0	135	4	0	0	5	0	0	6	371
	5:45 PM	0	183	19	0	132	2	0	0	5	0	0	8	349
	VOLUMES	0	1,713	146	0	1,103	10	0	0	41	0	0	46	3,060
	APPROACH %	0%	92%	8%	0%	99%	1%	0%	0%	100%	0%	0%	98%	
	APP/DEPART	1,859	/	1,759	1,113	/	1,144	41	/	147	47	/	10	0
	BEGIN PEAK HR	4:45 PM												
	VOLUMES	0	891	88	0	551	6	0	0	24	0	0	20	1,581
	APPROACH %	0%	91%	9%	0%	99%	1%	0%	0%	100%	0%	0%	95%	
	PEAK HR FACTOR	0.893			0.967			0.750			0.656			0.950
	APP/DEPART	979	/	911	557	/	575	24	/	89	21	/	6	0

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

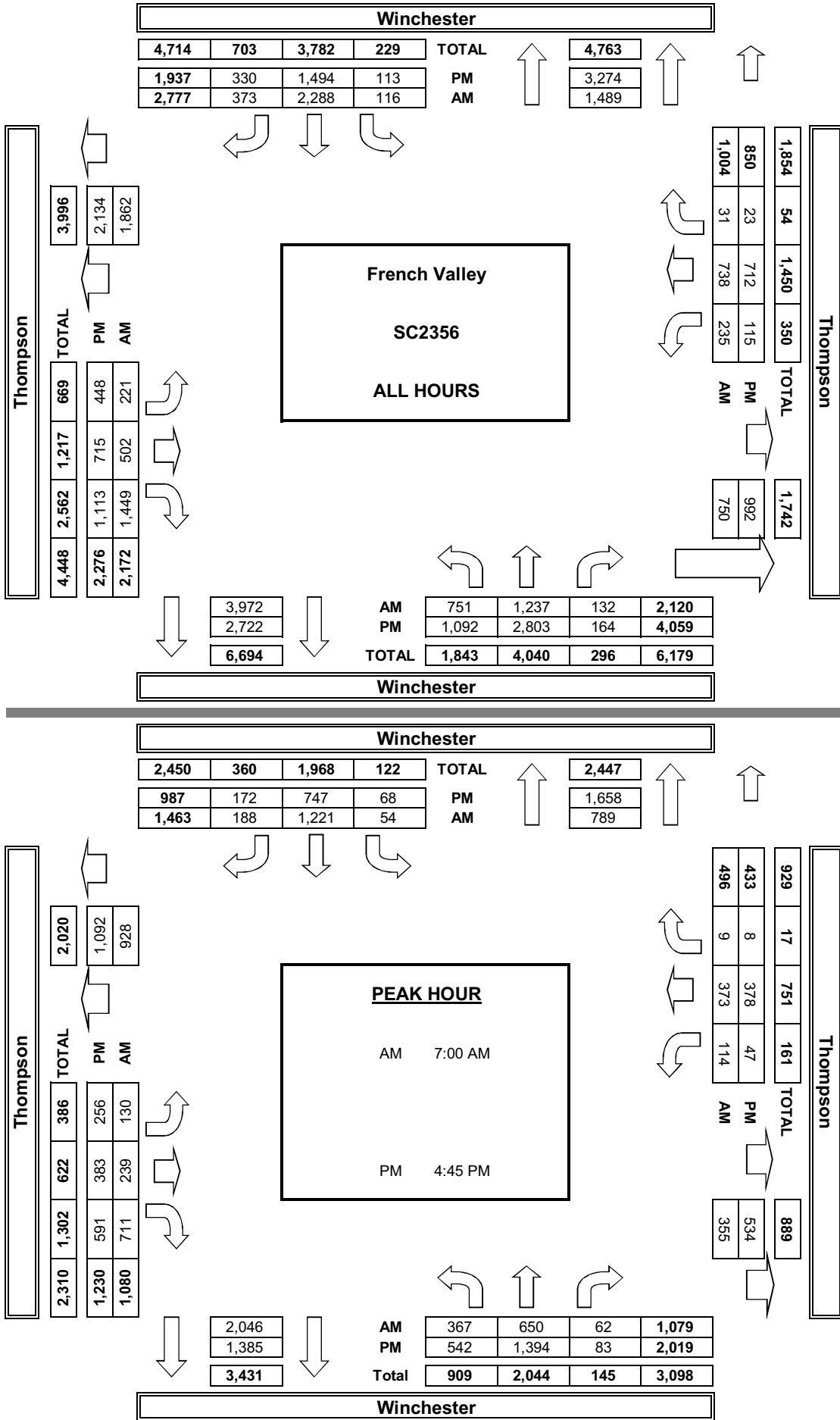
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Sep 18, 19	LOCATION: NORTH & SOUTH: EAST & WEST:	French Valley Winchester Thompson	PROJECT #: LOCATION #: CONTROL:	SC2356 2 SIGNAL
NOTES:				

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Winchester			Winchester			Thompson			Thompson			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	1.5	0.5	1	2	1	1	1	1	1	1	0	

AM	7:00 AM	90	169	12	8	288	48	37	51	130	24	95	2	954
	7:15 AM	85	170	22	13	299	49	25	54	181	24	113	3	1,038
	7:30 AM	109	169	15	18	322	47	28	76	197	25	84	2	1,092
	7:45 AM	83	142	13	15	312	44	40	58	203	41	81	2	1,034
	8:00 AM	88	113	13	23	267	36	27	61	166	39	90	5	928
	8:15 AM	112	160	12	18	263	55	13	70	178	34	86	5	1,006
	8:30 AM	89	184	28	11	292	52	24	57	186	23	86	5	1,037
	8:45 AM	95	130	17	10	245	42	27	75	208	25	103	7	984
	VOLUMES	751	1,237	132	116	2,288	373	221	502	1,449	235	738	31	8,073
	APPROACH %	35%	58%	6%	4%	82%	13%	10%	23%	67%	23%	74%	3%	
APP/DEPART	2,120	/	1,489	2,777	/	3,972	2,172	/	750	1,004	/	1,862	0	
BEGIN PEAK HR	7:00 AM													
VOLUMES	367	650	62	54	1,221	188	130	239	711	114	373	9	4,118	
APPROACH %	34%	60%	6%	4%	83%	13%	12%	22%	66%	23%	75%	2%		
PEAK HR FACTOR	0.921				0.945				0.897				0.886	
APP/DEPART	1,079	/	789	1,463	/	2,046	1,080	/	355	496	/	928	0	
PM	4:00 PM	133	354	12	8	179	46	46	73	126	15	83	4	1,079
	4:15 PM	140	340	22	13	201	33	36	80	140	16	88	3	1,112
	4:30 PM	145	354	19	18	191	43	45	88	114	18	86	5	1,126
	4:45 PM	148	360	20	18	171	48	51	107	153	16	97	1	1,190
	5:00 PM	145	358	26	15	180	32	57	87	140	12	97	3	1,152
	5:15 PM	129	362	15	14	198	44	70	103	152	13	92	3	1,195
	5:30 PM	120	314	22	21	198	48	78	86	146	6	92	1	1,132
	5:45 PM	132	361	28	6	176	36	65	91	142	19	77	3	1,136
	VOLUMES	1,092	2,803	164	113	1,494	330	448	715	1,113	115	712	23	9,122
	APPROACH %	27%	69%	4%	6%	77%	17%	20%	31%	49%	14%	84%	3%	
APP/DEPART	4,059	/	3,274	1,937	/	2,722	2,276	/	992	850	/	2,134	0	
BEGIN PEAK HR	4:45 PM													
VOLUMES	542	1,394	83	68	747	172	256	383	591	47	378	8	4,669	
APPROACH %	27%	69%	4%	7%	76%	17%	21%	31%	48%	11%	87%	2%		
PEAK HR FACTOR	0.954				0.924				0.946				0.950	
APP/DEPART	2,019	/	1,658	987	/	1,385	1,230	/	534	433	/	1,092	0	

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

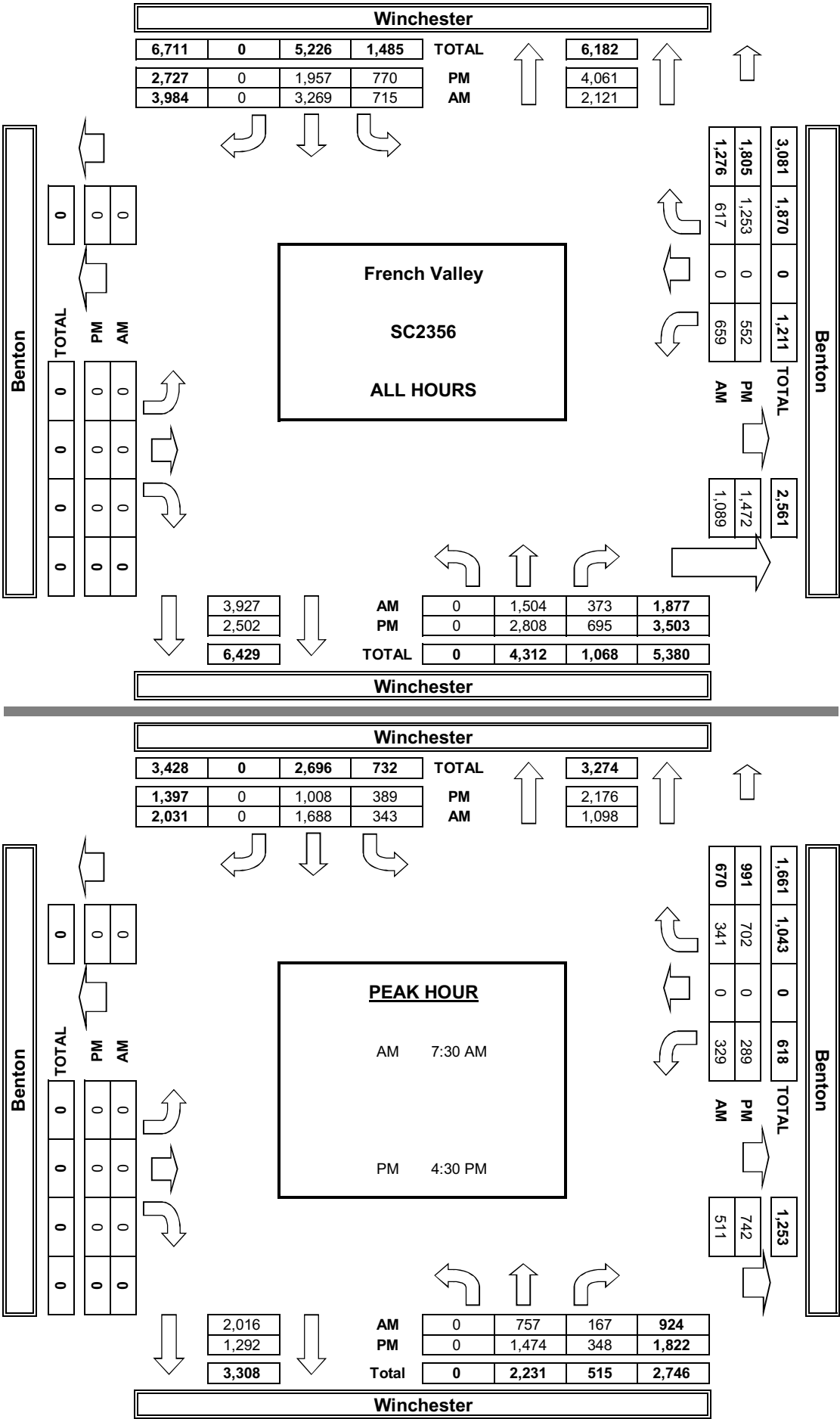
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Sep 18, 19	LOCATION: NORTH & SOUTH: EAST & WEST:	French Valley Winchester Benton	PROJECT #: LOCATION #: CONTROL:	SC2356 1 SIGNAL
NOTES:				

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Winchester			Winchester			Benton			Benton			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL

AM	7:00 AM	0	215	56	83	375	0	0	0	0	0	10	809
	7:15 AM	0	199	47	105	421	0	0	0	0	0	75	930
	7:30 AM	0	217	34	75	450	0	0	0	0	0	75	955
	7:45 AM	0	152	31	92	437	0	0	0	0	0	70	865
	8:00 AM	0	156	49	86	389	0	0	0	0	0	106	860
	8:15 AM	0	232	53	90	412	0	0	0	0	0	90	945
	8:30 AM	0	176	56	101	401	0	0	0	0	0	100	912
	8:45 AM	0	157	47	83	384	0	0	0	0	0	91	861
	VOLUMES	0	1,504	373	715	3,269	0	0	0	659	0	617	7,137
	APPROACH %	0%	80%	20%	18%	82%	0%	0%	0%	52%	0%	48%	
	APP/DEPART	1,877	/	2,121	3,984	/	3,927	0	/	1,089	1,276	/	0
	BEGIN PEAK HR	7:30 AM											
PM	VOLUMES	0	757	167	343	1,688	0	0	0	329	0	341	3,625
	APPROACH %	0%	82%	18%	17%	83%	0%	0%	0%	49%	0%	51%	
	PEAK HR FACTOR	0.811			0.960			0.000			0.931		
	APP/DEPART	924	/	1,098	2,031	/	2,016	0	/	511	670	/	0
	4:00 PM	0	345	77	78	237	0	0	0	0	0	149	958
	4:15 PM	0	336	92	106	250	0	0	0	0	0	135	977
	4:30 PM	0	382	92	86	257	0	0	0	0	0	193	1,070
	4:45 PM	0	365	89	99	213	0	0	0	0	0	159	988
	5:00 PM	0	344	78	100	255	0	0	0	0	0	202	1,059
	5:15 PM	0	383	89	104	283	0	0	0	0	0	148	1,093
	5:30 PM	0	347	81	91	238	0	0	0	0	0	140	978
	5:45 PM	0	306	97	106	224	0	0	0	0	0	127	912
	VOLUMES	0	2,808	695	770	1,957	0	0	0	552	0	1,253	8,035
	APPROACH %	0%	80%	20%	28%	72%	0%	0%	0%	31%	0%	69%	
	APP/DEPART	3,503	/	4,061	2,727	/	2,502	0	/	1,472	1,805	/	0
	BEGIN PEAK HR	4:30 PM											
	VOLUMES	0	1,474	348	389	1,008	0	0	0	289	0	702	4,210
	APPROACH %	0%	81%	19%	28%	72%	0%	0%	0%	29%	0%	71%	
	PEAK HR FACTOR	0.961			0.902			0.000			0.879		
	APP/DEPART	1,822	/	2,176	1,397	/	1,292	0	/	742	991	/	0

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

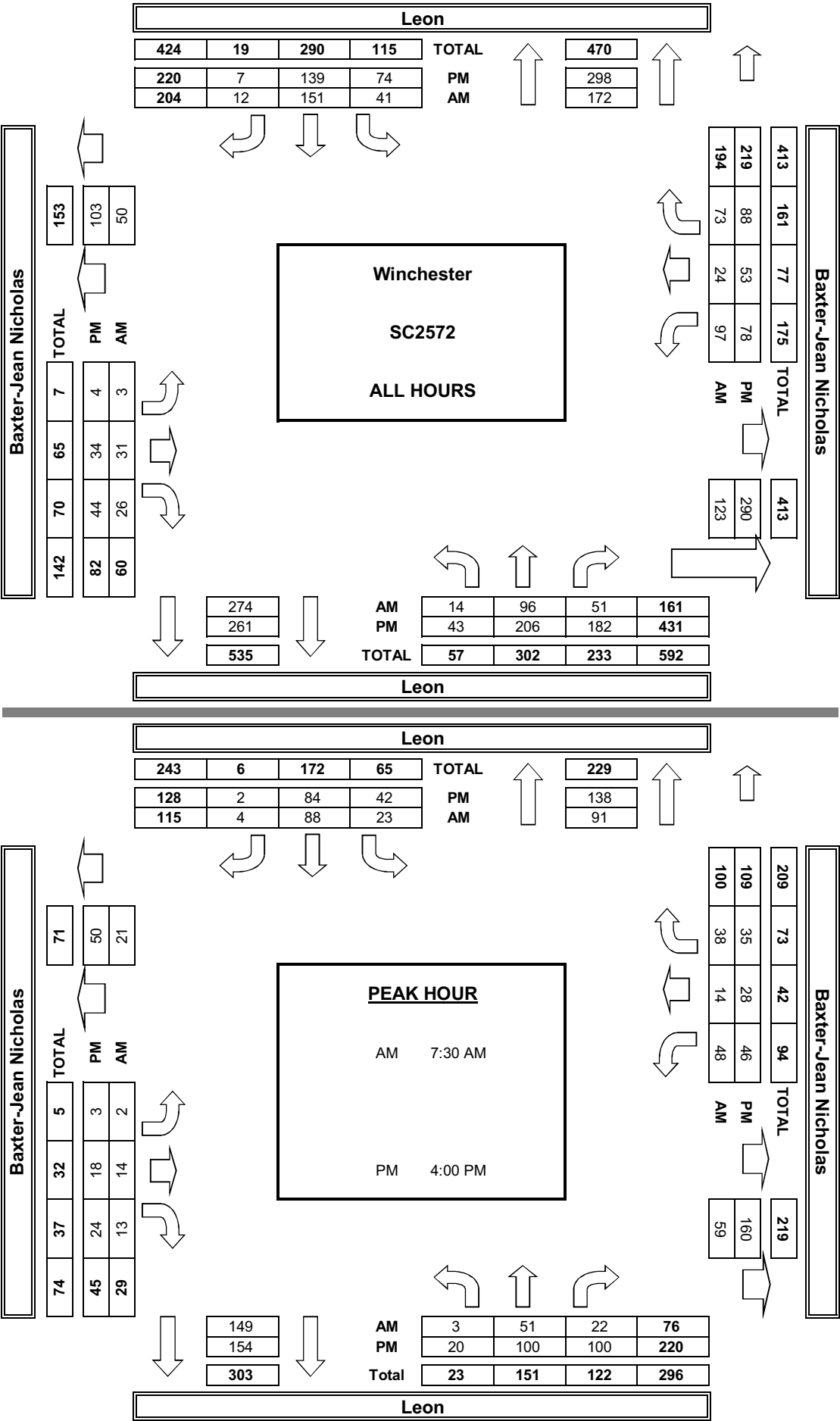
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Apr 22, 20	LOCATION: NORTH & SOUTH: EAST & WEST:	Winchester Leon Jean Nicholas	PROJECT #: SC2572 LOCATION #: 1 CONTROL: SIGNAL
NOTES:			

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Leon			Leon			Baxter-Jean Nicholas			Baxter-Jean Nicholas			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	2	0	1	2	0	1	2	0	1	2	0	

AM	7:00 AM	2	9	3	1	16	2	0	4	5	14	4	9	69
	7:15 AM	3	8	8	5	14	3	1	6	1	10	3	8	70
	7:30 AM	1	11	8	8	34	2	1	3	2	12	4	8	94
	7:45 AM	1	15	5	7	16	0	0	5	4	13	3	6	75
	8:00 AM	1	16	3	2	16	1	0	3	4	13	4	14	77
	8:15 AM	0	9	6	6	22	1	1	3	3	10	3	10	74
	8:30 AM	5	12	10	7	17	0	0	4	2	11	2	5	75
	8:45 AM	1	16	8	5	16	3	0	3	5	14	1	13	85
	VOLUMES	14	96	51	41	151	12	3	31	26	97	24	73	619
	APPROACH %	9%	60%	32%	20%	74%	6%	5%	52%	43%	50%	12%	38%	
APP/DEPART	161	/	172	204	/	274	60	/	123	194	/	50	0	
BEGIN PEAK HR	7:30 AM													
VOLUMES	3	51	22	23	88	4	2	14	13	48	14	38	320	
APPROACH %	4%	67%	29%	20%	77%	3%	7%	48%	45%	48%	14%	38%		
PEAK HR FACTOR	0.905			0.653			0.806			0.806			0.851	
APP/DEPART	76	/	91	115	/	149	29	/	59	100	/	21	0	
PM	4:00 PM	6	34	28	8	28	1	2	4	8	14	6	6	145
	4:15 PM	4	21	26	10	16	0	1	5	7	10	9	10	119
	4:30 PM	8	21	22	9	22	1	0	7	6	11	7	15	129
	4:45 PM	2	24	24	15	18	0	0	2	3	11	6	4	109
	5:00 PM	6	27	21	6	13	0	1	5	5	3	8	15	110
	5:15 PM	7	34	16	8	19	3	0	6	5	11	4	10	123
	5:30 PM	5	26	23	5	12	0	0	3	8	9	9	12	112
	5:45 PM	5	19	22	13	11	2	0	2	2	9	4	16	105
	VOLUMES	43	206	182	74	139	7	4	34	44	78	53	88	952
	APPROACH %	10%	48%	42%	34%	63%	3%	5%	41%	54%	36%	24%	40%	
	APP/DEPART	431	/	298	220	/	261	82	/	290	219	/	103	0
	BEGIN PEAK HR	4:00 PM												
VOLUMES	20	100	100	42	84	2	3	18	24	46	28	35	502	
APPROACH %	9%	45%	45%	33%	66%	2%	7%	40%	53%	42%	26%	32%		
PEAK HR FACTOR	0.809			0.865			0.804			0.826			0.866	
APP/DEPART	220	/	138	128	/	154	45	/	160	109	/	50	0	

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

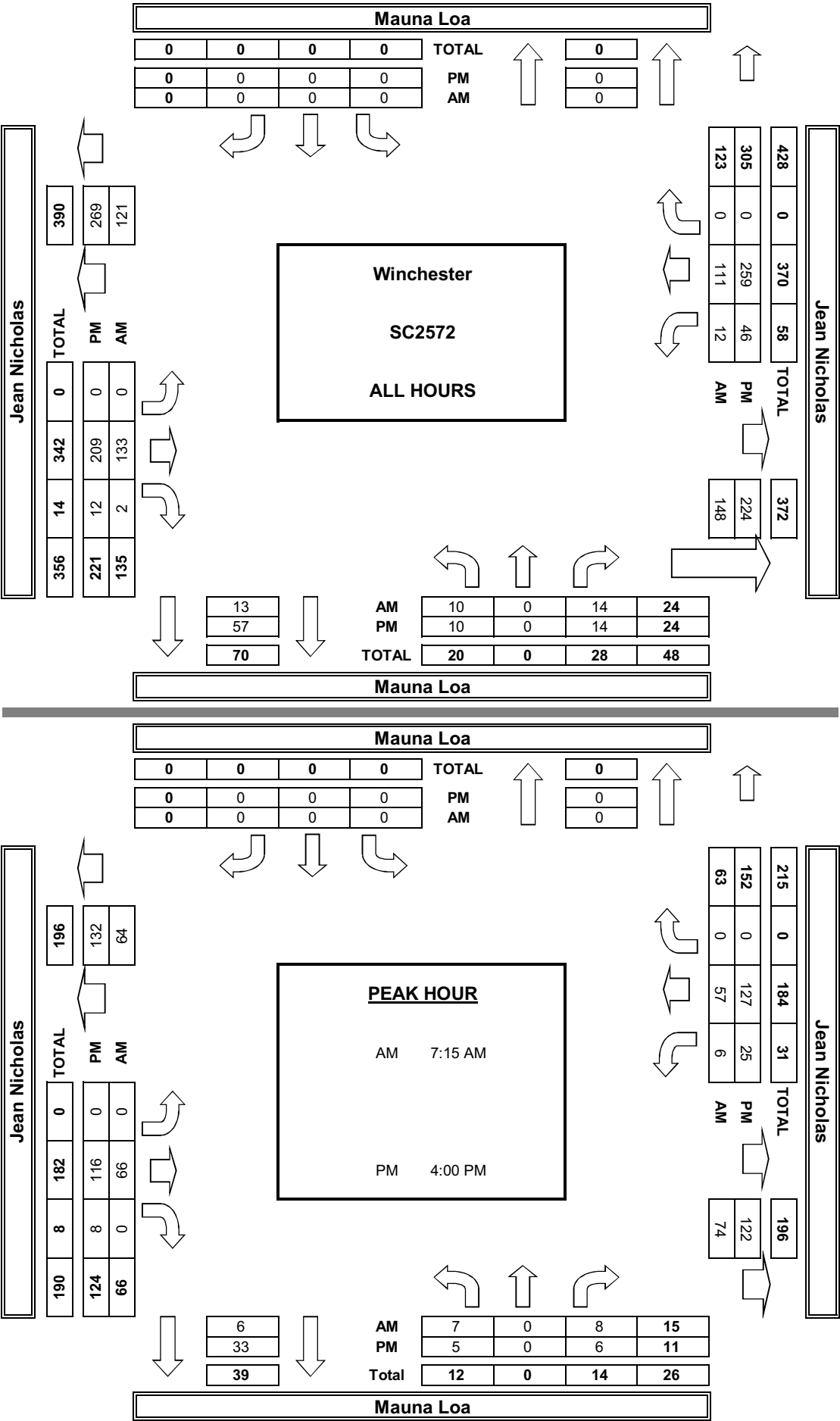
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Apr 22, 20	LOCATION: NORTH & SOUTH: EAST & WEST:	Winchester Mauna Loa Jean Nicholas	PROJECT #: SC2572 LOCATION #: 2 CONTROL: STOP N
NOTES:			

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Mauna Loa			Mauna Loa			Jean Nicholas			Jean Nicholas			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	X	0	X	X	X	X	2	0	1	1	X	

AM	7:00 AM	1	0	1	0	0	0	0	16	1	0	15	0	34
	7:15 AM	1	0	4	0	0	0	0	20	0	2	10	0	37
	7:30 AM	0	0	3	0	0	0	0	16	0	2	14	0	35
	7:45 AM	3	0	0	0	0	0	0	16	0	0	14	0	33
	8:00 AM	3	0	1	0	0	0	0	14	0	2	19	0	39
	8:15 AM	0	0	0	0	0	0	0	15	1	1	17	0	34
	8:30 AM	1	0	3	0	0	0	0	19	0	1	6	0	30
	8:45 AM	1	0	2	0	0	0	0	17	0	4	16	0	40
	VOLUMES	10	0	14	0	0	0	0	133	2	12	111	0	282
	APPROACH %	42%	0%	58%	0%	0%	0%	0%	99%	1%	10%	90%	0%	
APP/DEPART	24	/	0	0	/	13	135	/	148	123	/	121	0	
BEGIN PEAK HR	7:15 AM													
VOLUMES	7	0	8	0	0	0	0	66	0	6	57	0	144	
APPROACH %	47%	0%	53%	0%	0%	0%	0%	100%	0%	10%	90%	0%		
PEAK HR FACTOR	0.750			0.000			0.825			0.750			0.923	
APP/DEPART	15	/	0	0	/	6	66	/	74	63	/	64	0	
PM	4:00 PM	1	0	0	0	0	0	0	27	0	6	31	0	65
	4:15 PM	1	0	3	0	0	0	0	36	3	5	31	0	79
	4:30 PM	2	0	2	0	0	0	0	29	2	6	36	0	77
	4:45 PM	1	0	1	0	0	0	0	24	3	8	29	0	66
	5:00 PM	1	0	2	0	0	0	0	23	2	2	33	0	63
	5:15 PM	1	0	0	0	0	0	0	20	2	6	36	0	65
	5:30 PM	3	0	4	0	0	0	0	18	0	5	27	0	57
	5:45 PM	0	0	2	0	0	0	0	32	0	8	36	0	78
	VOLUMES	10	0	14	0	0	0	0	209	12	46	259	0	550
	APPROACH %	42%	0%	58%	0%	0%	0%	0%	95%	5%	15%	85%	0%	
	APP/DEPART	24	/	0	0	/	57	221	/	224	305	/	269	0
	BEGIN PEAK HR	4:00 PM												
	VOLUMES	5	0	6	0	0	0	0	116	8	25	127	0	287
APPROACH %	45%	0%	55%	0%	0%	0%	0%	94%	6%	16%	84%	0%		
PEAK HR FACTOR	0.688			0.000			0.795			0.905			0.908	
APP/DEPART	11	/	0	0	/	33	124	/	122	152	/	132	0	

AimTD LLC
TURNING MOVEMENT COUNTS



APPENDIX D

LEVEL OF SERVICE WORKSHEETS

Existing

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro
Report File: C:\...\AME.pdf

Scenario 1 Existing AM Peak Hour
5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	WB Left	0.744	18.1	B
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.640	13.2	B
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	EB Right	0.136	18.1	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	NB Left	1.068	55.2	E
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.832	13.9	B
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	EB Left	0.380	20.8	C
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	NB Left	0.083	13.8	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

18.1
B
0.744

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	TWO			TWO			TWO			TWO		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	735	96	199	1403	19	24	23	27	139	26	188
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	735	96	199	1403	19	24	23	27	139	26	188
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	193	25	52	369	5	6	6	7	37	7	49
Total Analysis Volume [veh/h]	14	774	101	209	1477	20	25	24	28	146	27	198
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	21	11	21	0	11	21	0	12	22	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	29	40	7	35	35	3	6	6	7	10	10
g / C, Green / Cycle	0.02	0.45	0.62	0.11	0.53	0.53	0.04	0.09	0.09	0.10	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.22	0.06	0.06	0.41	0.01	0.01	0.01	0.02	0.08	0.01	0.12
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	45	1607	982	366	1893	845	73	172	146	188	293	249
d1, Uniform Delay [s]	31.21	12.55	5.08	27.74	12.22	7.24	30.43	27.23	27.37	28.42	23.53	26.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.77	1.04	0.21	1.40	3.27	0.05	2.79	0.37	0.63	6.75	0.13	5.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.31	0.48	0.10	0.57	0.78	0.02	0.34	0.14	0.19	0.78	0.09	0.79
d, Delay for Lane Group [s/veh]	34.98	13.58	5.29	29.14	15.49	7.29	33.22	27.60	28.00	35.16	23.66	32.18
Lane Group LOS	C	B	A	C	B	A	C	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.24	3.14	0.37	1.42	6.43	0.10	0.41	0.33	0.39	2.36	0.33	3.04
50th-Percentile Queue Length [ft/ln]	5.99	78.43	9.18	35.58	160.81	2.54	10.15	8.26	9.81	59.01	8.29	76.01
95th-Percentile Queue Length [veh/ln]	0.43	5.65	0.66	2.56	10.59	0.18	0.73	0.59	0.71	4.25	0.60	5.47
95th-Percentile Queue Length [ft/ln]	10.79	141.18	16.52	64.04	264.80	4.57	18.27	14.87	17.66	106.22	14.92	136.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.98	13.58	5.29	29.14	15.49	7.29	33.22	27.60	28.00	35.16	23.66	32.18
Movement LOS	C	B	A	C	B	A	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	12.98			17.07			29.57			32.73		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	18.10											
Intersection LOS	B											
Intersection V/C	0.744											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			0.00			22.43		
I_p,int, Pedestrian LOS Score for Intersection	3.192			3.266			0.000			2.488		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			523			523			554		
d_b, Bicycle Delay [s]	17.72			17.72			17.72			16.99		
I_b,int, Bicycle LOS Score for Intersection	2.293			2.967			1.687			2.172		
Bicycle LOS	B			C			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.640

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	83	735	7	5	1374	189	102	1	82	13	11	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	735	7	5	1374	189	102	1	82	13	11	11
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	190	2	1	354	49	26	0	21	3	3	3
Total Analysis Volume [veh/h]	86	759	7	5	1418	195	105	1	85	13	11	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	19	37	0	11	21	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	54	54	1	49	49	6	7	7	2	3	3
g / C, Green / Cycle	0.08	0.68	0.68	0.01	0.61	0.61	0.08	0.09	0.09	0.02	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.05	0.21	0.00	0.00	0.40	0.12	0.06	0.00	0.05	0.01	0.01	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	136	2398	1071	20	2165	967	144	173	147	43	67	57
d1, Uniform Delay [s]	36.03	5.44	4.30	39.44	10.26	7.04	36.10	33.14	34.99	38.57	37.61	37.65
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	4.77	0.35	0.01	6.69	1.56	0.47	6.91	0.01	3.58	3.90	1.15	1.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.63	0.32	0.01	0.26	0.65	0.20	0.73	0.01	0.58	0.30	0.16	0.19
d, Delay for Lane Group [s/veh]	40.80	5.79	4.31	46.12	11.82	7.51	43.01	33.15	38.57	42.47	38.76	39.29
Lane Group LOS	D	A	A	D	B	A	D	C	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.68	1.66	0.03	0.13	5.96	1.16	2.17	0.02	1.64	0.28	0.22	0.22
50th-Percentile Queue Length [ft/ln]	41.95	41.55	0.65	3.17	149.12	29.07	54.14	0.43	41.07	7.12	5.49	5.61
95th-Percentile Queue Length [veh/ln]	3.02	2.99	0.05	0.23	9.97	2.09	3.90	0.03	2.96	0.51	0.40	0.40
95th-Percentile Queue Length [ft/ln]	75.51	74.78	1.16	5.70	249.25	52.32	97.45	0.78	73.93	12.81	9.89	10.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.80	5.79	4.31	46.12	11.82	7.51	43.01	33.15	38.57	42.47	38.76	39.29
Movement LOS	D	A	A	D	B	A	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	9.31			11.41			40.98			40.30		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	13.22											
Intersection LOS	B											
Intersection V/C	0.640											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			29.76			29.76		
I_p,int, Pedestrian LOS Score for Intersection	3.152			3.189			2.301			2.307		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	625			825			425			425		
d_b, Bicycle Delay [s]	18.91			13.81			24.81			24.81		
I_b,int, Bicycle LOS Score for Intersection	2.263			2.894			1.717			1.617		
Bicycle LOS	B			C			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.136

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	781	39	0	1463	4	0	0	38	0	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	781	39	0	1463	4	0	0	38	0	0	46
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	219	11	0	411	1	0	0	11	0	0	13
Total Analysis Volume [veh/h]	0	878	44	0	1644	4	0	0	43	0	0	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.14	0.00	0.00	0.09
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.12	0.00	0.00	12.01
Movement LOS		A	A		A	A			C			B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.30
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.61	0.00	0.00	7.56
d_A, Approach Delay [s/veh]	0.00			0.00			18.12			12.01		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	0.53											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	55.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.068

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	172	16	14	324	50	34	63	188	30	99	2
Total Analysis Volume [veh/h]	389	689	66	57	1295	199	138	253	754	121	396	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	27	58	0	11	42	0	13	29	29	12	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	23	55	55	6	38	38	9	25	52	8	24
g / C, Green / Cycle	0.21	0.50	0.50	0.05	0.35	0.35	0.08	0.23	0.47	0.07	0.22
(v / s)_i Volume / Saturation Flow Rate	0.22	0.20	0.21	0.03	0.36	0.13	0.08	0.14	0.47	0.07	0.22
s, saturation flow rate [veh/h]	1781	1870	1813	1781	3560	1589	1781	1870	1589	1781	1862
c, Capacity [veh/h]	372	941	912	94	1235	551	146	422	749	130	404
d1, Uniform Delay [s]	43.52	17.08	17.08	51.01	35.94	26.84	50.27	38.13	29.09	50.75	43.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.34	1.31	1.35	6.20	39.39	1.83	23.67	1.37	16.86	23.48	22.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.04	0.41	0.41	0.61	1.05	0.36	0.95	0.60	1.01	0.93	1.01
d, Delay for Lane Group [s/veh]	77.86	18.38	18.43	57.21	75.33	28.67	73.95	39.50	45.95	74.23	65.36
Lane Group LOS	F	B	B	E	F	C	E	D	F	E	F
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	13.04	5.73	5.57	1.63	21.84	3.91	4.62	6.03	21.32	4.06	12.98
50th-Percentile Queue Length [ft/ln]	326.02	143.19	139.27	40.75	546.06	97.79	115.59	150.84	533.11	101.55	324.59
95th-Percentile Queue Length [veh/ln]	19.41	9.65	9.44	2.93	30.47	7.04	8.15	10.06	29.04	7.31	18.96
95th-Percentile Queue Length [ft/ln]	485.29	241.32	236.04	73.34	761.82	176.01	203.74	251.55	726.06	182.78	473.89

Movement, Approach, & Intersection Results

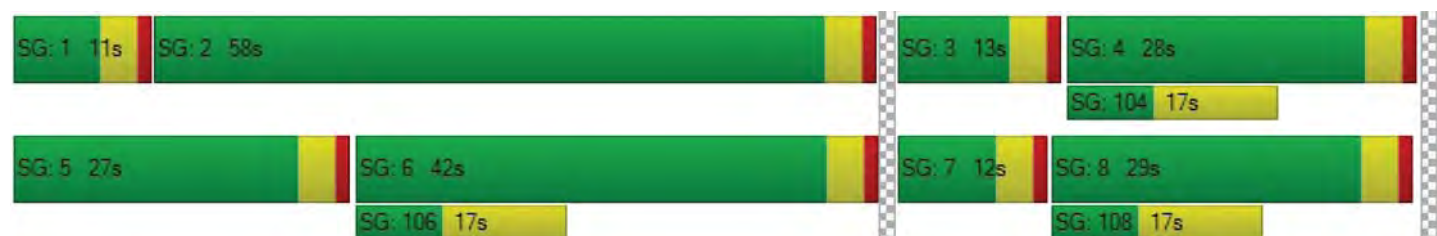
d_M, Delay for Movement [s/veh]	77.86	18.40	18.43	57.21	75.33	28.67	73.95	39.50	45.95	74.23	65.36	65.36
Movement LOS	F	B	B	E	F	C	E	D	F	E	E	E
d_A, Approach Delay [s/veh]	38.62			68.68			47.90			67.40		
Approach LOS	D			E			D			E		
d_I, Intersection Delay [s/veh]	55.20											
Intersection LOS	E											
Intersection V/C	1.068											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.494			3.174			2.919			0.000		
Crosswalk LOS	C			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	982			691			455			436		
d_b, Bicycle Delay [s]	14.25			23.56			32.84			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.503			2.839			3.449			2.429		
Bicycle LOS	B			C			C			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	13.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	757	167	343	1688	0	0	0	0	329	0	341
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	757	167	343	1688	0	0	0	0	329	0	341
Peak Hour Factor	1.0000	0.9490	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	1.0000	0.9490	1.0000	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	199	44	90	445	0	0	0	0	87	0	90
Total Analysis Volume [veh/h]	0	798	176	361	1779	0	0	0	0	347	0	359
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	21	0	18	39	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	60	60	60	60		60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	23	23	14	41		12	29
g / C, Green / Cycle	0.38	0.38	0.23	0.67		0.19	0.49
(v / s)_i Volume / Saturation Flow Rate	0.22	0.11	0.20	0.50		0.10	0.23
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1337	597	413	2400		669	782
d1, Uniform Delay [s]	15.15	13.22	22.30	6.40		21.81	10.06
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.97	1.26	5.88	2.11		0.63	0.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.29	0.87	0.74		0.52	0.46
d, Delay for Lane Group [s/veh]	17.12	14.47	28.18	8.51		22.44	10.48
Lane Group LOS	B	B	C	A		C	B
Critical Lane Group	No	No	No	Yes		No	Yes
50th-Percentile Queue Length [veh/ln]	4.24	1.70	5.19	5.24		2.10	2.71
50th-Percentile Queue Length [ft/ln]	105.89	42.44	129.66	131.02		52.61	67.65
95th-Percentile Queue Length [veh/ln]	7.61	3.06	8.92	9.00		3.79	4.87
95th-Percentile Queue Length [ft/ln]	190.28	76.39	223.03	224.88		94.70	121.77

Movement, Approach, & Intersection Results

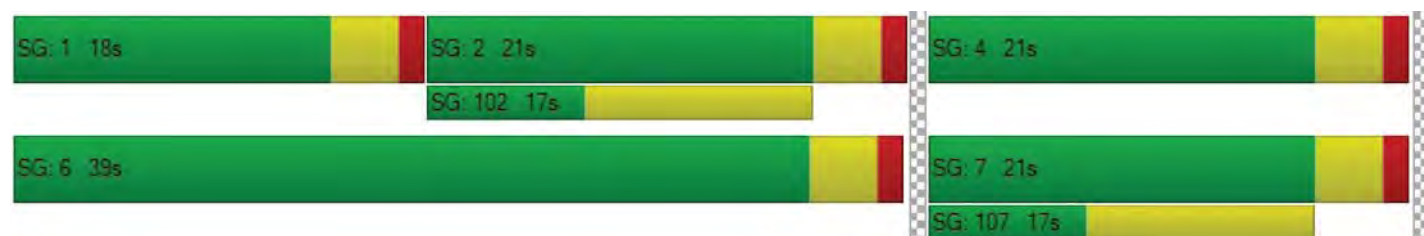
d_M, Delay for Movement [s/veh]	0.00	17.12	14.47	28.18	8.51	0.00	0.00	0.00	0.00	22.44	0.00	10.48
Movement LOS		B	B	C	A					C		B
d_A, Approach Delay [s/veh]	16.64			11.83			0.00			16.36		
Approach LOS	B			B			A			B		
d_I, Intersection Delay [s/veh]	13.90											
Intersection LOS	B											
Intersection V/C	0.832											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			0.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	20.01			0.00			0.00			20.01		
I_p,int, Pedestrian LOS Score for Intersection	2.882			0.000			0.000			2.412		
Crosswalk LOS	C			F			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	567			1167			0			0		
d_b, Bicycle Delay [s]	15.41			5.21			30.00			30.00		
I_b,int, Bicycle LOS Score for Intersection	2.363			3.325			4.132			4.132		
Bicycle LOS	B			C			D			D		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	20.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.380

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	185	53	55	319	20	5	34	31	234	68	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	185	53	55	319	20	5	34	31	234	68	185
Peak Hour Factor	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	54	16	16	94	6	1	10	9	69	20	54
Total Analysis Volume [veh/h]	8	217	62	65	375	24	6	40	36	275	80	217
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	12	21	0	17	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	31	31	5	35	35	1	5	5	13	17	17
g / C, Green / Cycle	0.02	0.44	0.44	0.07	0.50	0.50	0.01	0.08	0.08	0.18	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.00	0.08	0.08	0.04	0.11	0.11	0.00	0.02	0.02	0.15	0.04	0.14
s, saturation flow rate [veh/h]	1781	1870	1731	1781	1870	1831	1781	1870	1599	1781	1870	1589
c, Capacity [veh/h]	28	825	763	130	932	913	22	146	125	320	460	391
d1, Uniform Delay [s]	34.17	11.87	11.91	31.30	9.89	9.90	34.38	30.47	30.55	27.92	20.86	23.12
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	5.59	0.45	0.51	2.93	0.53	0.55	6.81	0.95	1.33	6.65	0.18	1.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.29	0.17	0.18	0.50	0.22	0.22	0.28	0.26	0.30	0.86	0.17	0.56
d, Delay for Lane Group [s/veh]	39.76	12.33	12.43	34.23	10.42	10.44	41.19	31.42	31.89	34.57	21.03	24.35
Lane Group LOS	D	B	B	C	B	B	D	C	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.17	1.19	1.16	1.07	1.48	1.46	0.14	0.60	0.60	4.63	0.95	2.93
50th-Percentile Queue Length [ft/ln]	4.17	29.80	28.95	26.72	36.92	36.45	3.38	15.12	14.97	115.76	23.83	73.29
95th-Percentile Queue Length [veh/ln]	0.30	2.15	2.08	1.92	2.66	2.62	0.24	1.09	1.08	8.16	1.72	5.28
95th-Percentile Queue Length [ft/ln]	7.50	53.64	52.11	48.09	66.45	65.61	6.08	27.21	26.95	203.99	42.89	131.92

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.76	12.36	12.43	34.23	10.43	10.44	41.19	31.44	31.89	34.57	21.03	24.35
Movement LOS	D	B	B	C	B	B	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	13.14			13.76			32.35			28.80		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.84											
Intersection LOS	C											
Intersection V/C	0.380											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	24.86			24.86			24.86			24.86		
I_p,int, Pedestrian LOS Score for Intersection	2.602			2.580			2.343			2.502		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	486			486			486			629		
d_b, Bicycle Delay [s]	20.06			20.06			20.06			16.46		
I_b,int, Bicycle LOS Score for Intersection	1.796			1.942			1.627			2.032		
Bicycle LOS	A			A			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.083

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	34	0	19	0	0	0	0	159	1	29	278	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	0	19	0	0	0	0	159	1	29	278	0
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	0	5	0	0	0	0	43	0	8	75	0
Total Analysis Volume [veh/h]	37	0	21	0	0	0	0	172	1	31	301	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	13.82	13.95	9.92	13.23	13.16	9.87	7.86	0.00	0.00	7.62	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.36	0.36	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
95th-Percentile Queue Length [ft/ln]	8.90	8.90	8.90	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00
d_A, Approach Delay [s/veh]	12.41			12.09			0.00			0.71		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.70											
Intersection LOS	B											

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\PME.vistro

Scenario 1 Existing PM Peak Hour

Report File: C:\...\PME.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	EB Left	0.833	24.8	C
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.593	13.7	B
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	WB Right	0.124	18.4	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	WB Thru	1.045	53.4	D
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.771	29.5	C
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	EB Left	0.333	18.0	B
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	NB Left	0.024	14.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.833

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	TWO			TWO			TWO			TWO		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	20	1358	132	205	859	21	7	17	17	125	26	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	1358	132	205	859	21	7	17	17	125	26	362
Peak Hour Factor	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	342	33	52	216	5	2	4	4	31	7	91
Total Analysis Volume [veh/h]	20	1366	133	206	864	21	7	17	17	126	26	364
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	85
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	40	40	11	40	0	12	21	0	13	22	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	85	85	85	85	85	85	85	85	85	85	85	85
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	40	51	7	44	44	1	15	15	8	21	21
g / C, Green / Cycle	0.03	0.47	0.60	0.08	0.52	0.52	0.01	0.17	0.17	0.09	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.01	0.38	0.08	0.06	0.24	0.01	0.00	0.01	0.01	0.07	0.01	0.23
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	57	1658	958	285	1836	820	24	325	277	161	469	399
d1, Uniform Delay [s]	40.36	19.74	7.33	38.15	13.19	10.13	41.62	29.33	29.38	37.93	24.24	31.00
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.61	4.80	0.30	3.48	0.87	0.06	6.56	0.07	0.09	8.06	0.05	8.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.35	0.82	0.14	0.72	0.47	0.03	0.29	0.05	0.06	0.78	0.06	0.91
d, Delay for Lane Group [s/veh]	43.97	24.54	7.64	41.63	14.06	10.18	48.18	29.40	29.47	45.99	24.29	39.40
Lane Group LOS	D	C	A	D	B	B	D	C	C	D	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.44	10.65	0.86	2.07	4.45	0.17	0.18	0.28	0.28	2.79	0.38	7.60
50th-Percentile Queue Length [ft/ln]	10.98	266.17	21.53	51.85	111.34	4.28	4.56	6.99	7.03	69.86	9.47	190.06
95th-Percentile Queue Length [veh/ln]	0.79	16.00	1.55	3.73	7.91	0.31	0.33	0.50	0.51	5.03	0.68	12.12
95th-Percentile Queue Length [ft/ln]	19.76	399.96	38.76	93.33	197.86	7.70	8.22	12.58	12.65	125.75	17.05	303.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.97	24.54	7.64	41.63	14.06	10.18	48.18	29.40	29.47	45.99	24.29	39.40
Movement LOS	D	C	A	D	B	B	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	23.32			19.19			32.63			40.25		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	24.78											
Intersection LOS	C											
Intersection V/C	0.833											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	32.21			32.21			0.00			32.21		
I_p,int, Pedestrian LOS Score for Intersection	3.202			3.313			0.000			2.551		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	847			847			400			424		
d_b, Bicycle Delay [s]	14.12			14.12			27.20			26.41		
I_b,int, Bicycle LOS Score for Intersection	2.813			2.460			1.627			2.411		
Bicycle LOS	C			B			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Signalized	Delay (sec / veh):	13.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	230	1422	25	6	928	66	88	9	74	11	4	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1422	25	6	928	66	88	9	74	11	4	3
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	365	6	2	238	17	23	2	19	3	1	1
Total Analysis Volume [veh/h]	236	1458	26	6	952	68	90	9	76	11	4	3
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	22	31	0	12	21	0	11	21	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	75	75	75	75	75	75	75	75	75	75	75	75
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	51	51	1	40	40	6	6	6	1	1	1
g / C, Green / Cycle	0.16	0.68	0.68	0.01	0.53	0.53	0.08	0.08	0.08	0.02	0.02	0.02
(v / s)_i Volume / Saturation Flow Rate	0.13	0.41	0.02	0.00	0.27	0.04	0.05	0.00	0.05	0.01	0.00	0.00
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	284	2409	1075	21	1883	841	143	147	125	36	35	30
d1, Uniform Delay [s]	30.61	6.66	4.00	36.83	11.39	8.72	33.51	32.09	33.54	36.32	36.30	36.29
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	6.17	1.14	0.04	6.98	0.97	0.19	4.53	0.17	4.75	4.65	1.45	1.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.83	0.61	0.02	0.28	0.51	0.08	0.63	0.06	0.61	0.30	0.12	0.10
d, Delay for Lane Group [s/veh]	36.78	7.80	4.04	43.81	12.37	8.91	38.05	32.26	38.29	40.97	37.75	37.77
Lane Group LOS	D	A	A	D	B	A	D	C	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.17	3.72	0.08	0.14	4.01	0.45	1.66	0.15	1.42	0.23	0.08	0.06
50th-Percentile Queue Length [ft/ln]	104.20	92.89	2.09	3.53	100.16	11.35	41.55	3.72	35.38	5.84	2.05	1.58
95th-Percentile Queue Length [veh/ln]	7.50	6.69	0.15	0.25	7.21	0.82	2.99	0.27	2.55	0.42	0.15	0.11
95th-Percentile Queue Length [ft/ln]	187.55	167.21	3.77	6.36	180.29	20.44	74.78	6.69	63.68	10.51	3.68	2.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.78	7.80	4.04	43.81	12.37	8.91	38.05	32.26	38.29	40.97	37.75	37.77
Movement LOS	D	A	A	D	B	A	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	11.72			12.32			37.85			39.72		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	13.66											
Intersection LOS	B											
Intersection V/C	0.593											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	27.31			27.31			27.31			27.31		
I_p,int, Pedestrian LOS Score for Intersection	3.265			3.211			2.298			2.307		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	720			453			453			453		
d_b, Bicycle Delay [s]	15.36			22.43			22.43			22.43		
I_b,int, Bicycle LOS Score for Intersection	2.979			2.406			1.704			1.589		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	18.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.124

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	llr			llr			r			r		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1607	159	0	1019	11	0	0	44	0	0	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1607	159	0	1019	11	0	0	44	0	0	36
Peak Hour Factor	0.8900	0.9500	0.9500	0.8900	0.9500	0.9500	0.8900	0.8900	0.9500	0.8900	0.8900	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	423	42	0	268	3	0	0	12	0	0	9
Total Analysis Volume [veh/h]	0	1692	167	0	1073	12	0	0	46	0	0	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.09	0.00	0.00	0.12
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.13	0.00	0.00	18.44
Movement LOS		A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.42
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.75	0.00	0.00	10.51
d_A, Approach Delay [s/veh]	0.00			0.00			13.13			18.44		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	0.43											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	53.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.045

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	139	357	21	17	191	44	66	98	151	12	97	2
Total Analysis Volume [veh/h]	555	1427	85	70	765	176	262	392	605	48	387	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	35	50	0	11	26	0	19	33	33	11	25	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	31	47	47	6	22	22	15	31	66	5	21
g / C, Green / Cycle	0.30	0.45	0.45	0.06	0.21	0.21	0.14	0.29	0.63	0.05	0.20
(v / s)_i Volume / Saturation Flow Rate	0.31	0.40	0.41	0.04	0.21	0.11	0.15	0.21	0.38	0.03	0.21
s, saturation flow rate [veh/h]	1781	1870	1834	1781	3560	1589	1781	1870	1589	1781	1863
c, Capacity [veh/h]	526	837	821	103	750	335	254	545	993	90	371
d1, Uniform Delay [s]	37.00	26.88	27.25	48.49	41.45	36.79	45.00	33.35	11.93	48.67	42.06
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	35.03	14.90	17.19	7.49	38.06	5.80	34.12	1.80	0.61	4.90	41.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.06	0.90	0.92	0.68	1.02	0.53	1.03	0.72	0.61	0.54	1.07
d, Delay for Lane Group [s/veh]	72.04	41.78	44.44	55.99	79.51	42.60	79.12	35.15	12.54	53.57	83.68
Lane Group LOS	F	D	D	E	F	D	F	D	B	D	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	17.45	18.82	19.49	1.92	13.00	4.30	8.78	8.75	7.36	1.31	13.44
50th-Percentile Queue Length [ft/ln]	436.33	470.59	487.21	48.11	324.92	107.60	219.38	218.65	183.97	32.81	336.01
95th-Percentile Queue Length [veh/ln]	25.13	25.94	26.73	3.46	19.12	7.71	13.81	13.60	11.81	2.36	20.11
95th-Percentile Queue Length [ft/ln]	628.34	648.48	668.20	86.59	477.93	192.66	345.32	339.90	295.19	59.07	502.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.04	43.03	44.44	55.99	79.51	42.60	79.12	35.15	12.54	53.57	83.68	83.68
Movement LOS	F	D	D	E	F	D	F	D	B	D	F	F
d_A, Approach Delay [s/veh]	50.88			71.45			33.43			80.42		
Approach LOS	D			E			C			F		
d_I, Intersection Delay [s/veh]	53.37											
Intersection LOS	D											
Intersection V/C	1.045											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	42.08			42.08			42.08			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.553			3.267			3.007			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	876			419			552			400		
d_b, Bicycle Delay [s]	16.58			32.80			27.50			33.60		
I_b,int, Bicycle LOS Score for Intersection	3.265			2.394			3.637			2.291		
Bicycle LOS	C			B			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.771

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1474	348	389	1008	0	0	0	0	289	0	702
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1474	348	389	1008	0	0	0	0	289	0	702
Peak Hour Factor	1.0000	0.9630	0.9630	0.9630	0.9630	1.0000	1.0000	1.0000	1.0000	0.9630	1.0000	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	383	90	101	262	0	0	0	0	75	0	182
Total Analysis Volume [veh/h]	0	1531	361	404	1047	0	0	0	0	300	0	729
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	48	0	31	79	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	100	100	100	100		100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	46	46	25	75		17	46
g / C, Green / Cycle	0.46	0.46	0.25	0.75		0.17	0.46
(v / s)_i Volume / Saturation Flow Rate	0.43	0.23	0.23	0.29		0.09	0.46
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1626	726	451	2670		589	737
d1, Uniform Delay [s]	25.92	19.12	36.12	4.44		37.74	26.63
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	12.18	2.43	6.53	0.43		0.68	13.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.94	0.50	0.90	0.39		0.51	0.99
d, Delay for Lane Group [s/veh]	38.10	21.55	42.65	4.87		38.43	39.84
Lane Group LOS	D	C	D	A		D	D
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	19.14	6.19	10.16	3.18		3.37	18.92
50th-Percentile Queue Length [ft/ln]	478.51	154.74	254.09	79.43		84.27	473.08
95th-Percentile Queue Length [veh/ln]	26.32	10.27	15.39	5.72		6.07	26.06
95th-Percentile Queue Length [ft/ln]	657.88	256.74	384.80	142.97		151.69	651.44

Movement, Approach, & Intersection Results

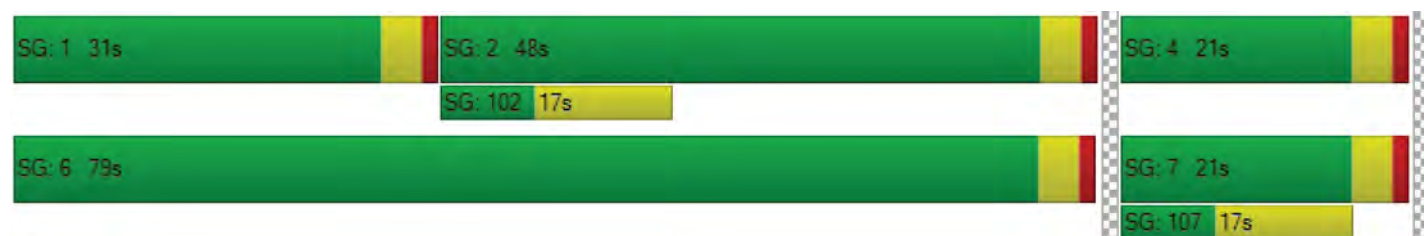
d_M, Delay for Movement [s/veh]	0.00	38.10	21.55	42.65	4.87	0.00	0.00	0.00	0.00	38.43	0.00	39.84
Movement LOS		D	C	D	A					D		D
d_A, Approach Delay [s/veh]	34.94			15.39			0.00			39.43		
Approach LOS	C			B			A			D		
d_I, Intersection Delay [s/veh]	29.51											
Intersection LOS	C											
Intersection V/C	0.771											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			0.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	39.61			0.00			0.00			39.61		
I_p,int, Pedestrian LOS Score for Intersection	2.936			0.000			0.000			2.573		
Crosswalk LOS	C			F			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	880			1500			0			0		
d_b, Bicycle Delay [s]	15.68			3.13			50.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	3.121			2.757			4.132			4.132		
Bicycle LOS	C			C			D			D		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.333

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	33	177	167	70	149	4	5	30	40	86	52	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	177	167	70	149	4	5	30	40	86	52	65
Peak Hour Factor	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	51	48	20	43	1	1	9	12	25	15	19
Total Analysis Volume [veh/h]	38	204	193	81	172	5	6	35	46	99	60	75
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	12	21	0	12	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	32	32	5	34	34	1	5	5	6	11	11
g / C, Green / Cycle	0.05	0.50	0.50	0.08	0.53	0.53	0.01	0.08	0.08	0.09	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.12	0.05	0.05	0.05	0.00	0.02	0.03	0.06	0.03	0.05
s, saturation flow rate [veh/h]	1781	1870	1589	1781	1870	1851	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	98	927	788	150	981	971	22	156	133	162	304	258
d1, Uniform Delay [s]	29.74	9.31	9.44	28.65	7.73	7.74	31.92	27.90	28.19	28.52	23.63	24.00
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	2.47	0.55	0.74	3.00	0.18	0.19	6.64	0.71	1.54	3.68	0.31	0.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.39	0.22	0.24	0.54	0.09	0.09	0.28	0.22	0.35	0.61	0.20	0.29
d, Delay for Lane Group [s/veh]	32.21	9.86	10.18	31.64	7.92	7.92	38.56	28.61	29.73	32.20	23.94	24.61
Lane Group LOS	C	A	B	C	A	A	D	C	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.58	1.36	1.33	1.21	0.49	0.49	0.13	0.50	0.67	1.52	0.74	0.96
50th-Percentile Queue Length [ft/ln]	14.61	33.89	33.18	30.24	12.36	12.32	3.16	12.38	16.83	37.91	18.62	23.91
95th-Percentile Queue Length [veh/ln]	1.05	2.44	2.39	2.18	0.89	0.89	0.23	0.89	1.21	2.73	1.34	1.72
95th-Percentile Queue Length [ft/ln]	26.29	60.99	59.72	54.43	22.25	22.18	5.69	22.29	30.30	68.23	33.52	43.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.21	9.86	10.18	31.64	7.92	7.92	38.56	28.61	29.73	32.20	23.94	24.61
Movement LOS	C	A	B	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	11.95			15.37			29.89			27.65		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	17.98											
Intersection LOS	B											
Intersection V/C	0.333											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.526			2.458			2.337			2.441		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			523			523			523		
d_b, Bicycle Delay [s]	17.72			17.72			17.72			17.72		
I_b,int, Bicycle LOS Score for Intersection	1.918			1.772			1.631			1.753		
Bicycle LOS	A			A			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	14.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	9	0	10	0	0	0	0	194	13	47	238	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	0	10	0	0	0	0	194	13	47	238	0
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	3	0	0	0	0	53	4	13	66	0
Total Analysis Volume [veh/h]	10	0	11	0	0	0	0	214	14	52	262	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	14.06	14.14	9.65	13.93	13.96	9.64	7.76	0.00	0.00	7.79	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.95	2.95	2.95	0.00	0.00	0.00	0.00	0.00	0.00	3.03	0.00	0.00
d_A, Approach Delay [s/veh]	11.75			12.51			0.00			1.29		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.16											
Intersection LOS	B											

Existing Plus Project

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro

Scenario 2 Existing Plus Project AM Peak Hour

Report File: C:\...\AMEP.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	NB Left	0.748	18.2	B
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.838	24.4	C
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	EB Right	0.142	18.8	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	SB Thru	1.075	58.2	E
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.842	14.3	B
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	EB Left	0.417	21.8	C
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	SB Left	0.602	32.4	D
8	Project East Dwy (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	EB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

18.2
B
0.748

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	三			三			三			三		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	735	96	199	1403	19	24	23	27	139	26	188
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	22	0	10	0	0	0	0	22	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	745	118	199	1413	19	24	23	27	161	26	188
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	196	31	52	372	5	6	6	7	42	7	49
Total Analysis Volume [veh/h]	14	784	124	209	1487	20	25	24	28	169	27	198
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	21	11	21	0	11	21	0	12	22	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	29	41	7	35	35	3	5	5	8	10	10
g / C, Green / Cycle	0.02	0.45	0.63	0.11	0.53	0.53	0.04	0.08	0.08	0.12	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.22	0.08	0.06	0.42	0.01	0.01	0.01	0.02	0.09	0.01	0.12
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	45	1607	1004	366	1893	845	73	146	124	212	293	249
d1, Uniform Delay [s]	31.21	12.59	4.80	27.74	12.28	7.24	30.43	28.06	28.19	27.95	23.53	26.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.77	1.06	0.25	1.40	3.37	0.05	2.79	0.52	0.90	6.68	0.13	5.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.31	0.49	0.12	0.57	0.79	0.02	0.34	0.16	0.22	0.80	0.09	0.79
d, Delay for Lane Group [s/veh]	34.98	13.65	5.05	29.14	15.65	7.29	33.22	28.58	29.10	34.63	23.66	32.18
Lane Group LOS	C	B	A	C	B	A	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.24	3.19	0.42	1.42	6.52	0.10	0.41	0.34	0.41	2.70	0.33	3.04
50th-Percentile Queue Length [ft/ln]	5.99	79.78	10.58	35.58	163.07	2.54	10.15	8.50	10.13	67.62	8.29	76.01
95th-Percentile Queue Length [veh/ln]	0.43	5.74	0.76	2.56	10.71	0.18	0.73	0.61	0.73	4.87	0.60	5.47
95th-Percentile Queue Length [ft/ln]	10.79	143.61	19.05	64.04	267.78	4.57	18.27	15.30	18.23	121.72	14.92	136.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.98	13.65	5.05	29.14	15.65	7.29	33.22	28.58	29.10	34.63	23.66	32.18
Movement LOS	C	B	A	C	B	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	12.82			17.19			30.27			32.65		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	18.18											
Intersection LOS	B											
Intersection V/C	0.748											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			0.00			22.43		
I_p,int, Pedestrian LOS Score for Intersection	3.211			3.271			0.000			2.502		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			523			523			554		
d_b, Bicycle Delay [s]	17.72			17.72			17.72			16.99		
I_b,int, Bicycle LOS Score for Intersection	2.320			2.975			1.687			2.210		
Bicycle LOS	B			C			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Signalized	Delay (sec / veh):	24.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.838

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	83	735	7	5	1374	189	102	1	82	13	11	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	141	0	0	0	0	121	120	0	142	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	224	735	7	5	1374	310	222	1	224	13	11	11
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	190	2	1	354	80	57	0	58	3	3	3
Total Analysis Volume [veh/h]	231	759	7	5	1418	320	229	1	231	13	11	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	85
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	26	0	11	21	0	27	37	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	85	85	85	85	85	85	85	85	85	85	85	85
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	52	52	1	41	41	13	15	15	2	3	3
g / C, Green / Cycle	0.14	0.61	0.61	0.01	0.48	0.48	0.15	0.17	0.17	0.02	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.13	0.21	0.00	0.00	0.40	0.20	0.13	0.00	0.15	0.01	0.01	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	252	2162	965	18	1694	756	274	322	274	41	77	66
d1, Uniform Delay [s]	36.08	8.36	6.61	41.87	19.46	14.66	35.00	29.20	34.15	40.98	39.39	39.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	12.71	0.45	0.01	8.25	5.11	1.74	6.64	0.00	6.97	4.44	0.84	1.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.92	0.35	0.01	0.28	0.84	0.42	0.84	0.00	0.84	0.32	0.14	0.17
d, Delay for Lane Group [s/veh]	48.79	8.81	6.62	50.12	24.58	16.40	41.64	29.21	41.12	45.42	40.23	40.62
Lane Group LOS	D	A	A	D	C	B	D	C	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.21	2.66	0.04	0.14	11.04	3.71	4.83	0.02	4.86	0.31	0.23	0.23
50th-Percentile Queue Length [ft/ln]	130.25	66.47	1.01	3.45	275.91	92.71	120.74	0.41	121.49	7.65	5.73	5.83
95th-Percentile Queue Length [veh/ln]	8.95	4.79	0.07	0.25	16.48	6.68	8.43	0.03	8.48	0.55	0.41	0.42
95th-Percentile Queue Length [ft/ln]	223.84	119.65	1.82	6.22	412.12	166.88	210.84	0.74	211.88	13.77	10.32	10.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.79	8.81	6.62	50.12	24.58	16.40	41.64	29.21	41.12	45.42	40.23	40.62
Movement LOS	D	A	A	D	C	B	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	18.06			23.15			41.35			42.28		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	24.38											
Intersection LOS	C											
Intersection V/C	0.838											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	32.21			32.21			32.21			32.21		
I_p,int, Pedestrian LOS Score for Intersection	3.242			3.266			2.596			2.310		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	518			400			776			400		
d_b, Bicycle Delay [s]	23.35			27.20			15.91			27.20		
I_b,int, Bicycle LOS Score for Intersection	2.382			2.998			1.940			1.617		
Bicycle LOS	B			C			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	18.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.142

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	781	39	0	1463	4	0	0	38	0	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	34	0	0	51	3	0	0	0	0	0	18
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	815	39	0	1514	7	0	0	38	0	0	64
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	229	11	0	425	2	0	0	11	0	0	18
Total Analysis Volume [veh/h]	0	916	44	0	1701	8	0	0	43	0	0	72
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.14	0.00	0.00	0.13
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.80	0.00	0.00	12.53
Movement LOS		A	A		A	A			C			B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.45
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.19	0.00	0.00	11.22
d_A, Approach Delay [s/veh]	0.00			0.00			18.80			12.53		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	0.61											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	58.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.075

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	22	0	29	22	0	0	0	0	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	367	672	62	83	1243	188	130	239	711	114	373	21
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	178	16	22	330	50	34	63	188	30	99	6
Total Analysis Volume [veh/h]	389	713	66	88	1318	199	138	253	754	121	396	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	27	25	0	44	42	0	13	29	29	12	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	23	54	54	7	38	38	9	25	52	8	24
g / C, Green / Cycle	0.21	0.49	0.49	0.06	0.35	0.35	0.08	0.23	0.47	0.07	0.22
(v / s)_i Volume / Saturation Flow Rate	0.22	0.21	0.21	0.05	0.37	0.13	0.08	0.14	0.47	0.07	0.23
s, saturation flow rate [veh/h]	1781	1870	1815	1781	3560	1589	1781	1870	1589	1781	1853
c, Capacity [veh/h]	372	920	893	114	1235	551	146	422	749	130	402
d1, Uniform Delay [s]	43.52	18.01	18.01	50.71	35.94	26.84	50.27	38.13	29.09	50.75	43.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.34	1.46	1.51	10.48	45.65	1.83	23.67	1.37	16.86	23.48	32.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.04	0.43	0.43	0.77	1.07	0.36	0.95	0.60	1.01	0.93	1.04
d, Delay for Lane Group [s/veh]	77.86	19.47	19.53	61.19	81.59	28.67	73.95	39.50	45.95	74.23	75.45
Lane Group LOS	F	B	B	E	F	C	E	D	F	E	F
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	13.04	6.15	5.99	2.61	22.92	3.91	4.62	6.03	21.32	4.06	14.05
50th-Percentile Queue Length [ft/ln]	326.02	153.65	149.63	65.21	572.88	97.79	115.59	150.84	533.11	101.55	351.16
95th-Percentile Queue Length [veh/ln]	19.41	10.21	10.00	4.69	32.14	7.04	8.15	10.06	29.04	7.31	20.64
95th-Percentile Queue Length [ft/ln]	485.29	255.30	249.94	117.37	803.52	176.01	203.74	251.55	726.06	182.78	516.05

Movement, Approach, & Intersection Results

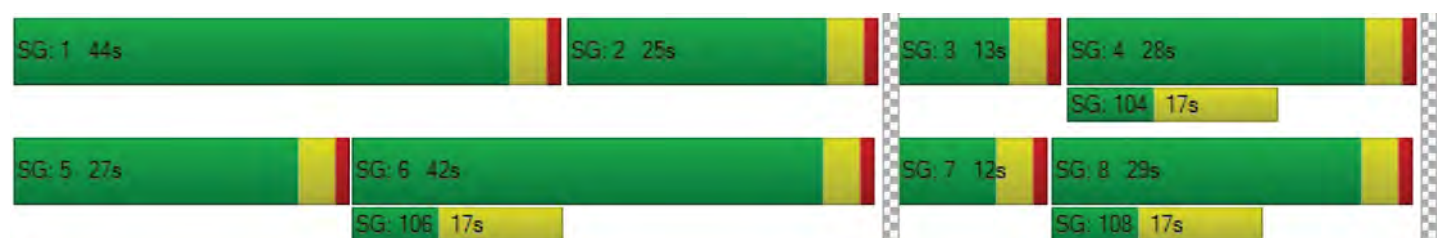
d_M, Delay for Movement [s/veh]	77.86	19.50	19.53	61.19	81.59	28.67	73.95	39.50	45.95	74.23	75.45	75.45
Movement LOS	F	B	B	E	F	C	E	D	F	E	E	E
d_A, Approach Delay [s/veh]	38.94			73.91			47.90			75.18		
Approach LOS	D			E			D			E		
d_I, Intersection Delay [s/veh]	58.21											
Intersection LOS	E											
Intersection V/C	1.075											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.511			3.201			2.919			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	382			691			455			436		
d_b, Bicycle Delay [s]	36.00			23.56			32.84			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.523			2.884			3.449			2.449		
Bicycle LOS	B			C			C			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.842

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	757	167	343	1688	0	0	0	0	329	0	341
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	0	12	10	0	0	0	0	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	767	167	355	1698	0	0	0	0	329	0	353
Peak Hour Factor	1.0000	0.9490	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	1.0000	0.9490	1.0000	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	202	44	94	447	0	0	0	0	87	0	93
Total Analysis Volume [veh/h]	0	808	176	374	1789	0	0	0	0	347	0	372
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	21	0	18	39	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	60	60	60	60		60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	22	22	14	40		12	30
g / C, Green / Cycle	0.37	0.37	0.23	0.67		0.20	0.50
(v / s)_i Volume / Saturation Flow Rate	0.23	0.11	0.21	0.50		0.10	0.23
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1312	586	417	2381		687	793
d1, Uniform Delay [s]	15.56	13.52	22.40	6.65		21.52	9.88
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	2.17	1.32	7.11	2.24		0.58	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.30	0.90	0.75		0.50	0.47
d, Delay for Lane Group [s/veh]	17.73	14.84	29.52	8.90		22.09	10.32
Lane Group LOS	B	B	C	A		C	B
Critical Lane Group	No	No	No	Yes		No	Yes
50th-Percentile Queue Length [veh/ln]	4.40	1.73	5.52	5.49		2.08	2.77
50th-Percentile Queue Length [ft/ln]	109.90	43.22	138.00	137.16		52.11	69.27
95th-Percentile Queue Length [veh/ln]	7.83	3.11	9.37	9.33		3.75	4.99
95th-Percentile Queue Length [ft/ln]	195.86	77.79	234.33	233.20		93.80	124.69

Movement, Approach, & Intersection Results

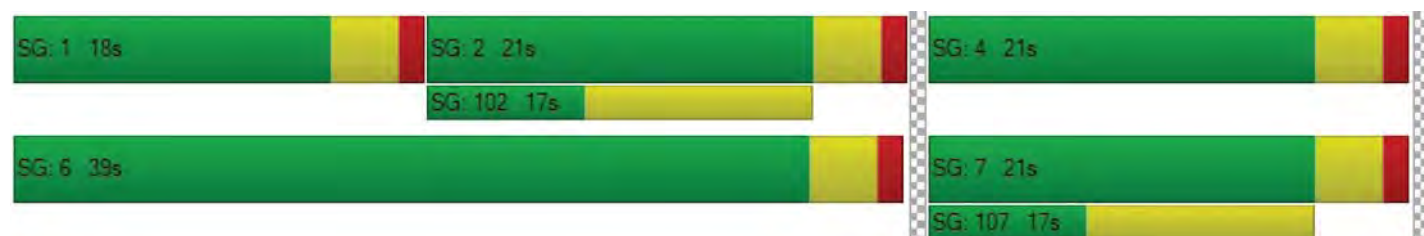
d_M, Delay for Movement [s/veh]	0.00	17.73	14.84	29.52	8.90	0.00	0.00	0.00	0.00	22.09	0.00	10.32
Movement LOS		B	B	C	A					C		B
d_A, Approach Delay [s/veh]	17.21			12.46			0.00			16.00		
Approach LOS	B			B			A			B		
d_I, Intersection Delay [s/veh]	14.33											
Intersection LOS	B											
Intersection V/C	0.842											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			0.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	20.01			0.00			0.00			20.01		
I_p,int, Pedestrian LOS Score for Intersection	2.886			0.000			0.000			2.418		
Crosswalk LOS	C			F			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	567			1167			0			0		
d_b, Bicycle Delay [s]	15.41			5.21			30.00			30.00		
I_b,int, Bicycle LOS Score for Intersection	2.371			3.344			4.132			4.132		
Bicycle LOS	B			C			D			D		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.417

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	185	53	55	319	20	5	34	31	234	68	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	22	1	0	0	0	15	0	22	14	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	185	75	56	319	20	5	49	31	256	82	186
Peak Hour Factor	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	54	22	16	94	6	1	14	9	75	24	55
Total Analysis Volume [veh/h]	8	217	88	66	375	24	6	58	36	301	96	219
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	12	21	0	17	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	30	30	5	34	34	1	6	6	13	18	18
g / C, Green / Cycle	0.02	0.43	0.43	0.07	0.49	0.49	0.01	0.08	0.08	0.19	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.00	0.08	0.09	0.04	0.11	0.11	0.00	0.03	0.03	0.17	0.05	0.14
s, saturation flow rate [veh/h]	1781	1870	1693	1781	1870	1831	1781	1870	1645	1781	1870	1589
c, Capacity [veh/h]	28	800	724	131	909	890	22	158	139	331	483	411
d1, Uniform Delay [s]	34.17	12.54	12.59	31.28	10.39	10.40	34.38	30.18	30.27	28.00	20.35	22.39
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	5.59	0.55	0.64	2.96	0.56	0.58	6.81	1.05	1.39	9.53	0.20	1.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.29	0.20	0.20	0.50	0.22	0.22	0.28	0.30	0.33	0.91	0.20	0.53
d, Delay for Lane Group [s/veh]	39.76	13.09	13.23	34.23	10.95	10.98	41.19	31.24	31.66	37.53	20.55	23.47
Lane Group LOS	D	B	B	C	B	B	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.17	1.38	1.32	1.09	1.54	1.52	0.14	0.74	0.73	5.33	1.13	2.88
50th-Percentile Queue Length [ft/ln]	4.17	34.40	33.02	27.13	38.48	38.00	3.38	18.59	18.37	133.20	28.18	72.11
95th-Percentile Queue Length [veh/ln]	0.30	2.48	2.38	1.95	2.77	2.74	0.24	1.34	1.32	9.11	2.03	5.19
95th-Percentile Queue Length [ft/ln]	7.50	61.92	59.43	48.83	69.27	68.40	6.08	33.46	33.06	227.84	50.72	129.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.76	13.13	13.23	34.23	10.96	10.98	41.19	31.31	31.66	37.53	20.55	23.47
Movement LOS	D	B	B	C	B	B	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	13.84			14.27			32.03			29.88		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	21.80											
Intersection LOS	C											
Intersection V/C	0.417											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	24.86			24.86			24.86			24.86		
I_p,int, Pedestrian LOS Score for Intersection	2.619			2.581			2.353			2.528		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	486			486			486			629		
d_b, Bicycle Delay [s]	20.06			20.06			20.06			16.46		
I_b,int, Bicycle LOS Score for Intersection	1.818			1.943			1.642			2.068		
Bicycle LOS	A			A			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	34	0	19	0	0	0	0	159	1	29	278	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	174	7	71	76	0	0	0	0	68
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	7	19	174	7	71	76	159	1	29	278	68
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	2	5	47	2	19	21	43	0	8	75	18
Total Analysis Volume [veh/h]	37	8	21	189	8	77	82	172	1	31	301	74
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.03	0.02	0.60	0.03	0.09	0.07	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	17.03	18.63	10.34	32.40	17.17	10.06	8.28	0.00	0.00	7.63	0.00	0.00
Movement LOS	C	C	B	D	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.55	0.55	0.55	3.67	0.40	0.40	0.22	0.00	0.00	0.07	0.00	0.00
95th-Percentile Queue Length [ft/ln]	13.72	13.72	13.72	91.85	10.09	10.09	5.59	0.00	0.00	1.70	0.00	0.00
d_A, Approach Delay [s/veh]	15.10			25.67			2.66			0.58		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	8.94											
Intersection LOS	D											

Intersection Level Of Service Report**Intersection 8: Project East Dwy (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration					T	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	185	283	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	88	0	0	174	68	194
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	0	0	359	351	194
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	0	94	92	51
Total Analysis Volume [veh/h]	88	0	0	378	369	204
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS				A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vistro File: C:\...\PME.vistro
Report File: C:\...\PMEP.pdf

Scenario 2 Existing Plus Project PM Peak Hour
5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	EB Left	0.835	25.0	C
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.718	19.8	B
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	WB Right	0.174	19.5	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	EB Left	1.034	55.3	E
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.780	30.4	C
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	EB Left	0.363	18.6	B
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	SB Left	0.407	22.7	C
8	Project East Dwy (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	WB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.835

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	20	1358	132	205	859	21	7	17	17	125	26	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	16	0	8	0	0	0	0	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	1366	148	205	867	21	7	17	17	141	26	362
Peak Hour Factor	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	344	37	52	218	5	2	4	4	35	7	91
Total Analysis Volume [veh/h]	20	1374	149	206	872	21	7	17	17	142	26	364
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	85
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	24	24	11	24	0	29	21	0	29	21	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	85	85	85	85	85	85	85	85	85	85	85	85
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	39	52	7	43	43	1	14	14	9	22	22
g / C, Green / Cycle	0.03	0.46	0.61	0.08	0.51	0.51	0.01	0.16	0.16	0.11	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.01	0.39	0.09	0.06	0.24	0.01	0.00	0.01	0.01	0.08	0.01	0.23
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	57	1633	972	285	1811	809	24	309	263	189	482	410
d1, Uniform Delay [s]	40.36	20.33	7.09	38.15	13.61	10.42	41.62	29.96	30.01	36.99	23.79	30.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.61	5.44	0.33	3.48	0.92	0.06	6.56	0.07	0.10	5.91	0.05	6.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.35	0.84	0.15	0.72	0.48	0.03	0.29	0.06	0.06	0.75	0.05	0.89
d, Delay for Lane Group [s/veh]	43.97	25.77	7.43	41.63	14.53	10.48	48.18	30.03	30.11	42.91	23.84	37.08
Lane Group LOS	D	C	A	D	B	B	D	C	C	D	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.44	11.02	0.94	2.07	4.59	0.17	0.18	0.28	0.29	3.02	0.38	7.36
50th-Percentile Queue Length [ft/ln]	10.98	275.50	23.41	51.85	114.86	4.35	4.56	7.10	7.14	75.59	9.38	184.12
95th-Percentile Queue Length [veh/ln]	0.79	16.46	1.69	3.73	8.11	0.31	0.33	0.51	0.51	5.44	0.68	11.82
95th-Percentile Queue Length [ft/ln]	19.76	411.61	42.15	93.33	202.74	7.84	8.22	12.77	12.85	136.06	16.88	295.38

Movement, Approach, & Intersection Results

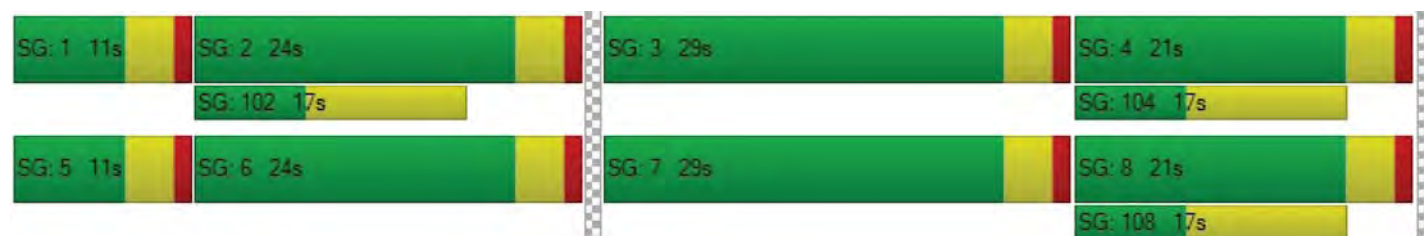
d_M, Delay for Movement [s/veh]	43.97	25.77	7.43	41.63	14.53	10.48	48.18	30.03	30.11	42.91	23.84	37.08
Movement LOS	D	C	A	D	B	B	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	24.24			19.54			33.16			37.99		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	25.02											
Intersection LOS	C											
Intersection V/C	0.835											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	32.21			32.21			0.00			32.21		
I_p,int, Pedestrian LOS Score for Intersection	3.216			3.317			0.000			2.561		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	471			471			400			400		
d_b, Bicycle Delay [s]	24.85			24.85			27.20			27.20		
I_b,int, Bicycle LOS Score for Intersection	2.833			2.466			1.627			2.437		
Bicycle LOS	C			B			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Signalized	Delay (sec / veh):	19.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.718

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	230	1422	25	6	928	66	88	9	74	11	4	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	98	0	0	0	0	83	83	0	101	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	328	1422	25	6	928	149	171	9	175	11	4	3
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	84	365	6	2	238	38	44	2	45	3	1	1
Total Analysis Volume [veh/h]	336	1458	26	6	952	153	175	9	179	11	4	3
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	31	0	13	21	0	15	25	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	51	51	1	35	35	10	11	11	2	3	3
g / C, Green / Cycle	0.21	0.63	0.63	0.01	0.43	0.43	0.12	0.14	0.14	0.02	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.19	0.41	0.02	0.00	0.27	0.10	0.10	0.00	0.11	0.01	0.00	0.00
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	379	2243	1001	21	1528	682	215	259	220	36	71	61
d1, Uniform Delay [s]	30.64	9.30	5.58	39.29	17.84	14.46	34.39	29.90	33.53	38.75	37.18	37.17
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	7.10	1.48	0.05	7.13	1.92	0.76	7.32	0.05	7.04	4.78	0.32	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.89	0.65	0.03	0.28	0.62	0.22	0.81	0.03	0.81	0.31	0.06	0.05
d, Delay for Lane Group [s/veh]	37.74	10.78	5.63	46.42	19.76	15.22	41.71	29.95	40.57	43.53	37.51	37.51
Lane Group LOS	D	B	A	D	B	B	D	C	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.34	5.62	0.12	0.15	6.02	1.61	3.55	0.15	3.58	0.25	0.08	0.06
50th-Percentile Queue Length [ft/ln]	158.60	140.60	3.10	3.75	150.59	40.18	88.63	3.63	89.52	6.23	1.95	1.48
95th-Percentile Queue Length [veh/ln]	10.47	9.51	0.22	0.27	10.05	2.89	6.38	0.26	6.45	0.45	0.14	0.11
95th-Percentile Queue Length [ft/ln]	261.86	237.83	5.58	6.75	251.22	72.33	159.53	6.53	161.14	11.22	3.51	2.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.74	10.78	5.63	46.42	19.76	15.22	41.71	29.95	40.57	43.53	37.51	37.51
Movement LOS	D	B	A	D	B	B	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	15.68			19.28			40.86			41.19		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.79											
Intersection LOS	B											
Intersection V/C	0.718											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			29.76			29.76		
I_p,int, Pedestrian LOS Score for Intersection	3.329			3.265			2.544			2.310		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	675			425			525			425		
d_b, Bicycle Delay [s]	17.56			24.81			21.76			24.81		
I_b,int, Bicycle LOS Score for Intersection	3.061			2.476			1.859			1.589		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	19.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.174

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1607	159	0	1019	11	0	0	44	0	0	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	26	0	0	39	2	0	0	0	0	0	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1633	159	0	1058	13	0	0	44	0	0	49
Peak Hour Factor	0.8900	0.9500	0.9500	0.8900	0.9500	0.9500	0.8900	0.8900	0.9500	0.8900	0.8900	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	430	42	0	278	3	0	0	12	0	0	13
Total Analysis Volume [veh/h]	0	1719	167	0	1114	14	0	0	46	0	0	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.10	0.00	0.00	0.17
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.41	0.00	0.00	19.53
Movement LOS		A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.62
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.02	0.00	0.00	15.45
d_A, Approach Delay [s/veh]	0.00			0.00			13.41			19.53		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	0.52											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	55.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.034

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	22	17	0	0	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	542	1411	83	90	764	172	256	383	591	47	378	17
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	139	361	21	23	195	44	66	98	151	12	97	4
Total Analysis Volume [veh/h]	555	1444	85	92	782	176	262	392	605	48	387	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	39	59	0	11	31	0	21	27	27	23	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	35	55	55	7	27	27	17	36	75	6	25
g / C, Green / Cycle	0.29	0.46	0.46	0.06	0.23	0.23	0.14	0.30	0.63	0.05	0.21
(v / s)_i Volume / Saturation Flow Rate	0.31	0.41	0.42	0.05	0.22	0.11	0.15	0.21	0.38	0.03	0.22
s, saturation flow rate [veh/h]	1781	1870	1834	1781	3560	1589	1781	1870	1589	1781	1856
c, Capacity [veh/h]	519	859	842	104	805	359	252	565	997	83	385
d1, Uniform Delay [s]	42.50	29.67	30.08	56.10	46.06	40.42	51.50	36.95	13.45	56.05	47.56
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	39.85	13.35	15.32	20.65	25.54	4.71	36.84	1.54	0.60	6.23	35.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.07	0.89	0.91	0.89	0.97	0.49	1.04	0.69	0.61	0.58	1.05
d, Delay for Lane Group [s/veh]	82.35	43.02	45.39	76.75	71.60	45.13	88.34	38.48	14.05	62.29	83.37
Lane Group LOS	F	D	D	E	E	D	F	D	B	E	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	20.12	21.31	21.96	3.25	13.78	4.78	9.94	10.00	8.80	1.54	14.91
50th-Percentile Queue Length [ft/ln]	502.89	532.85	549.05	81.28	344.40	119.60	248.61	249.95	219.98	38.39	372.86
95th-Percentile Queue Length [veh/ln]	28.63	28.89	29.65	5.85	19.86	8.37	15.38	15.18	13.66	2.76	21.82
95th-Percentile Queue Length [ft/ln]	715.74	722.14	741.19	146.30	496.58	209.28	384.41	379.59	341.60	69.10	545.45

Movement, Approach, & Intersection Results

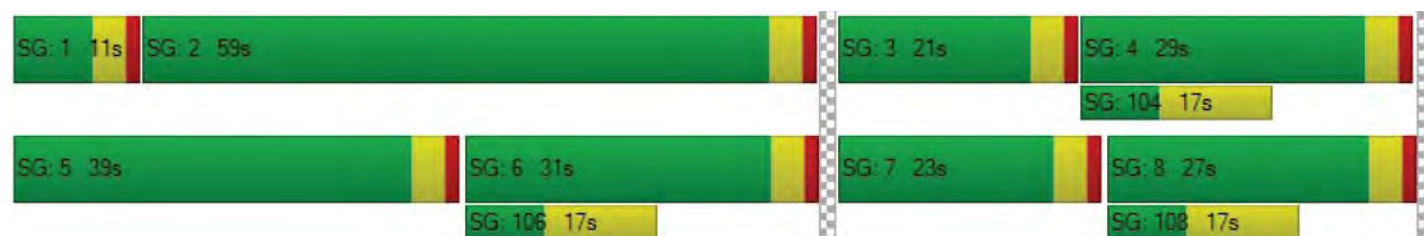
d_M, Delay for Movement [s/veh]	82.35	44.14	45.39	76.75	71.60	45.13	88.34	38.48	14.05	62.29	83.37	83.37
Movement LOS	F	D	D	E	E	D	F	D	B	E	F	F
d_A, Approach Delay [s/veh]	54.37			67.62			37.12			81.13		
Approach LOS	D			E			D			F		
d_I, Intersection Delay [s/veh]	55.25											
Intersection LOS	E											
Intersection V/C	1.034											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.572			3.293			3.014			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	917			450			383			417		
d_b, Bicycle Delay [s]	17.60			36.04			39.20			37.60		
I_b,int, Bicycle LOS Score for Intersection	3.279			2.426			3.637			2.305		
Bicycle LOS	C			B			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1474	348	389	1008	0	0	0	0	289	0	702
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	9	8	0	0	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1482	348	398	1016	0	0	0	0	289	0	711
Peak Hour Factor	1.0000	0.9630	0.9630	0.9630	0.9630	1.0000	1.0000	1.0000	1.0000	0.9630	1.0000	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	385	90	103	264	0	0	0	0	75	0	185
Total Analysis Volume [veh/h]	0	1539	361	413	1055	0	0	0	0	300	0	738
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	49	0	30	79	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	100	100	100	100		100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	46	46	25	75		17	46
g / C, Green / Cycle	0.46	0.46	0.25	0.75		0.17	0.46
(v / s)_i Volume / Saturation Flow Rate	0.43	0.23	0.23	0.30		0.09	0.46
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1623	725	452	2669		590	738
d1, Uniform Delay [s]	26.14	19.20	36.33	4.46		37.77	26.85
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	13.02	2.44	7.59	0.44		0.68	15.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.50	0.91	0.40		0.51	1.00
d, Delay for Lane Group [s/veh]	39.16	21.64	43.93	4.90		38.45	42.23
Lane Group LOS	D	C	D	A		D	D
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	19.51	6.20	10.57	3.22		3.37	19.74
50th-Percentile Queue Length [ft/ln]	487.77	155.08	264.27	80.43		84.31	493.47
95th-Percentile Queue Length [veh/ln]	26.75	10.29	15.90	5.79		6.07	27.02
95th-Percentile Queue Length [ft/ln]	668.87	257.20	397.57	144.78		151.77	675.62

Movement, Approach, & Intersection Results

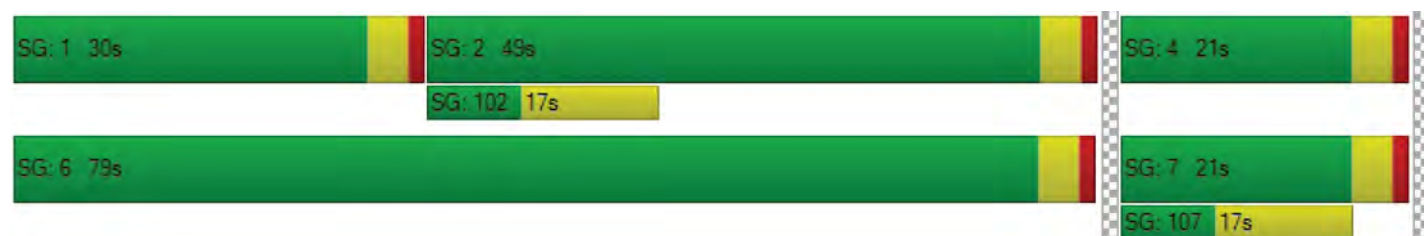
d_M, Delay for Movement [s/veh]	0.00	39.16	21.64	43.93	4.90	0.00	0.00	0.00	0.00	38.45	0.00	42.23
Movement LOS		D	C	D	A					D		D
d_A, Approach Delay [s/veh]	35.84			15.88			0.00			41.14		
Approach LOS	D			B			A			D		
d_I, Intersection Delay [s/veh]	30.44											
Intersection LOS	C											
Intersection V/C	0.780											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	0.00	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.939	0.000	0.000	2.578
Crosswalk LOS	C	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	900	1500	0	0
d_b, Bicycle Delay [s]	15.13	3.13	50.00	50.00
I_b,int, Bicycle LOS Score for Intersection	3.127	2.771	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.363

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	33	177	167	70	149	4	5	30	40	86	52	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	1	0	0	0	11	0	16	11	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	177	183	71	149	4	5	41	40	102	63	66
Peak Hour Factor	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	51	53	20	43	1	1	12	12	29	18	19
Total Analysis Volume [veh/h]	38	204	211	82	172	5	6	47	46	118	73	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	12	21	0	12	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	32	32	5	34	34	1	6	6	6	11	11
g / C, Green / Cycle	0.05	0.49	0.49	0.08	0.52	0.52	0.01	0.09	0.09	0.10	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.13	0.05	0.05	0.05	0.00	0.03	0.03	0.07	0.04	0.05
s, saturation flow rate [veh/h]	1781	1870	1589	1781	1870	1851	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	98	907	771	151	963	953	22	165	141	171	322	274
d1, Uniform Delay [s]	29.74	9.70	9.96	28.64	8.06	8.06	31.92	27.79	27.90	28.52	23.24	23.45
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	2.47	0.57	0.88	3.03	0.19	0.19	6.64	0.93	1.34	4.85	0.35	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.39	0.22	0.27	0.54	0.09	0.09	0.28	0.28	0.33	0.69	0.23	0.28
d, Delay for Lane Group [s/veh]	32.21	10.27	10.84	31.66	8.25	8.25	38.56	28.72	29.24	33.37	23.59	24.00
Lane Group LOS	C	B	B	C	A	A	D	C	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.58	1.40	1.52	1.22	0.51	0.51	0.13	0.67	0.66	1.85	0.90	0.95
50th-Percentile Queue Length [ft/ln]	14.61	35.06	38.10	30.62	12.81	12.77	3.16	16.65	16.62	46.18	22.46	23.80
95th-Percentile Queue Length [veh/ln]	1.05	2.52	2.74	2.20	0.92	0.92	0.23	1.20	1.20	3.32	1.62	1.71
95th-Percentile Queue Length [ft/ln]	26.29	63.11	68.59	55.12	23.06	22.98	5.69	29.97	29.91	83.12	40.42	42.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.21	10.27	10.84	31.66	8.25	8.25	38.56	28.72	29.24	33.37	23.59	24.00
Movement LOS	C	B	B	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	12.37			15.66			29.56			28.03		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	18.62											
Intersection LOS	B											
Intersection V/C	0.363											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.538			2.459			2.345			2.459		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			523			523			523		
d_b, Bicycle Delay [s]	17.72			17.72			17.72			17.72		
I_b,int, Bicycle LOS Score for Intersection	1.933			1.773			1.641			1.780		
Bicycle LOS	A			A			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	22.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.407

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	9	0	10	0	0	0	0	194	13	47	238	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	125	5	52	54	0	0	0	0	47
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	5	10	125	5	52	54	194	13	47	238	47
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	3	34	1	14	15	53	4	13	66	13
Total Analysis Volume [veh/h]	10	6	11	138	6	57	59	214	14	52	262	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.01	0.41	0.02	0.07	0.05	0.00	0.00	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	15.98	17.25	9.45	22.73	16.89	9.64	8.04	0.00	0.00	7.80	0.00	0.00
Movement LOS	C	C	A	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.19	0.19	0.19	1.91	0.28	0.28	0.15	0.00	0.00	0.12	0.00	0.00
95th-Percentile Queue Length [ft/ln]	4.82	4.82	4.82	47.86	6.97	6.97	3.73	0.00	0.00	3.03	0.00	0.00
d_A, Approach Delay [s/veh]	13.60			18.84			1.65			1.11		
Approach LOS	B			C			A			A		
d_I, Intersection Delay [s/veh]	5.71											
Intersection LOS	C											

Intersection Level Of Service Report**Intersection 8: Project East Dwy (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration					T	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	171	300	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	59	0	0	125	47	134
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	0	0	296	347	134
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	0	0	78	91	35
Total Analysis Volume [veh/h]	59	0	0	312	365	141
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS				A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro

Scenario 3 Existing Plus Project AM Peak Hour - With
Improvements

Report File: C:\...\AMEPI.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	SB Thru	0.779	54.4	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

54.4
D
0.779

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	22	0	29	22	0	0	0	0	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	367	672	62	83	1243	188	130	239	711	114	373	21
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	178	16	22	330	50	34	63	188	30	99	6
Total Analysis Volume [veh/h]	389	713	66	88	1318	199	138	253	754	121	396	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	29	11	0	63	45	0	11	28	28	13	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	59	59	7	41	41	7	24	53	9	26
g / C, Green / Cycle	0.22	0.51	0.51	0.06	0.36	0.36	0.06	0.21	0.46	0.08	0.23
(v / s)_i Volume / Saturation Flow Rate	0.22	0.21	0.21	0.05	0.37	0.13	0.04	0.14	0.47	0.07	0.23
s, saturation flow rate [veh/h]	1781	1870	1815	1781	3560	1589	3459	1870	1589	1781	1853
c, Capacity [veh/h]	387	956	928	114	1274	569	208	388	730	140	418
d1, Uniform Delay [s]	45.02	17.41	17.42	53.03	36.94	27.12	52.91	41.80	31.09	52.42	44.55
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.39	1.32	1.36	10.60	34.57	1.69	3.58	1.86	24.59	14.62	20.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.00	0.41	0.41	0.77	1.03	0.35	0.66	0.65	1.03	0.87	1.00
d, Delay for Lane Group [s/veh]	67.41	18.73	18.78	63.64	71.51	28.81	56.49	43.66	55.68	67.05	65.17
Lane Group LOS	F	B	B	E	F	C	E	D	F	E	F
Critical Lane Group	No	No	No	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	12.79	6.16	6.00	2.73	22.50	4.02	2.01	6.56	23.48	3.93	13.81
50th-Percentile Queue Length [ft/ln]	319.75	154.10	150.05	68.30	562.50	100.62	50.13	164.04	587.05	98.17	345.15
95th-Percentile Queue Length [veh/ln]	18.70	10.24	10.02	4.92	31.00	7.24	3.61	10.76	32.20	7.07	19.91
95th-Percentile Queue Length [ft/ln]	467.60	255.90	250.50	122.94	775.05	181.11	90.24	269.06	804.93	176.71	497.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.41	18.75	18.78	63.64	71.51	28.81	56.49	43.66	55.68	67.05	65.17	65.17
Movement LOS	F	B	B	E	F	C	E	D	F	E	E	E
d_A, Approach Delay [s/veh]	34.96			65.79			53.12			65.59		
Approach LOS	C			E			D			E		
d_I, Intersection Delay [s/veh]	54.43											
Intersection LOS	D											
Intersection V/C	0.779											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	47.03			47.03			47.03			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.513			3.203			2.934			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	122			713			417			452		
d_b, Bicycle Delay [s]	50.71			23.81			36.00			34.44		
I_b,int, Bicycle LOS Score for Intersection	2.523			2.884			3.449			2.449		
Bicycle LOS	B			C			C			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Winchester at Jean Nicholas Commercial

Vistro File: C:\...\PME.vistro

Scenario 3 Existing Plus Project PM Peak Hour - With
Improvements

Report File: C:\...\PMEPI.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	EB Left	0.982	42.8	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	42.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.982

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth 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
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	22	17	0	0	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	542	1411	83	90	764	172	256	383	591	47	378	17
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	139	361	21	23	195	44	66	98	151	12	97	4
Total Analysis Volume [veh/h]	555	1444	85	92	782	176	262	392	605	48	387	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	35	51	0	11	27	0	12	25	25	13	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	31	48	48	7	23	23	8	25	60	5	22
g / C, Green / Cycle	0.31	0.48	0.48	0.07	0.23	0.23	0.08	0.25	0.60	0.05	0.22
(v / s)_i Volume / Saturation Flow Rate	0.31	0.41	0.42	0.05	0.22	0.11	0.08	0.21	0.38	0.03	0.22
s, saturation flow rate [veh/h]	1781	1870	1834	1781	3560	1589	3459	1870	1589	1781	1856
c, Capacity [veh/h]	552	890	873	117	824	368	277	462	949	92	406
d1, Uniform Delay [s]	34.51	23.24	23.56	46.05	37.85	33.22	45.79	35.89	13.12	46.22	39.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	19.09	10.57	11.99	11.10	21.13	4.40	15.20	4.44	0.72	4.51	19.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.01	0.86	0.88	0.79	0.95	0.48	0.95	0.85	0.64	0.52	1.00
d, Delay for Lane Group [s/veh]	53.60	33.81	35.54	57.15	58.99	37.62	61.00	40.33	13.84	50.74	58.86
Lane Group LOS	F	C	D	E	E	D	E	D	B	D	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	15.05	16.26	16.75	2.49	11.11	3.88	3.70	9.17	7.63	1.24	11.59
50th-Percentile Queue Length [ft/ln]	376.19	406.61	418.64	62.21	277.79	97.09	92.54	229.20	190.64	30.98	289.85
95th-Percentile Queue Length [veh/ln]	21.48	22.88	23.46	4.48	16.58	6.99	6.66	14.13	12.15	2.23	17.18
95th-Percentile Queue Length [ft/ln]	537.07	571.96	586.42	111.98	414.46	174.77	166.58	353.35	303.86	55.76	429.46

Movement, Approach, & Intersection Results

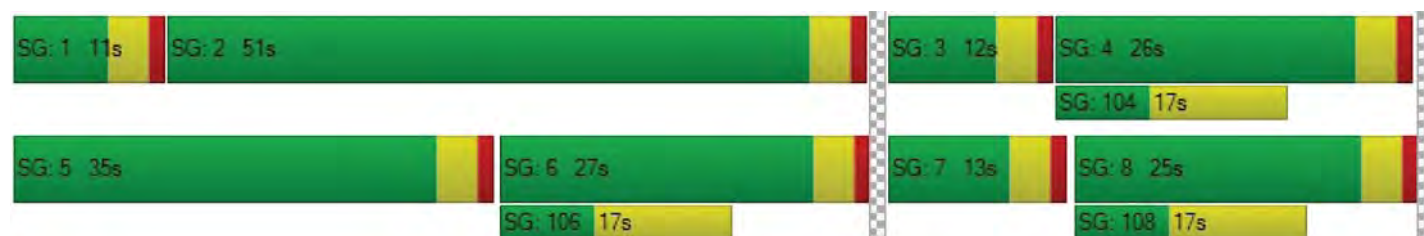
d_M, Delay for Movement [s/veh]	53.60	34.62	35.54	57.15	58.99	37.62	61.00	40.33	13.84	50.74	58.86	58.86
Movement LOS	F	C	D	E	E	D	E	D	B	D	E	E
d_A, Approach Delay [s/veh]	39.72			55.24			31.90			58.00		
Approach LOS	D			E			C			E		
d_I, Intersection Delay [s/veh]	42.76											
Intersection LOS	D											
Intersection V/C	0.982											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.563			3.284			3.000			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	940			460			420			440		
d_b, Bicycle Delay [s]	14.05			29.65			31.21			30.42		
I_b,int, Bicycle LOS Score for Intersection	3.279			2.426			3.637			2.305		
Bicycle LOS	C			B			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Existing Plus Ambient Plus Project

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro

Scenario 4 Existing Plus Ambient Growth Plus Project AM
Peak Hour

Report File: C:\...\AMEAP.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	NB Left	0.760	19.1	B
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.852	25.8	C
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	EB Right	0.156	19.8	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	SB Thru	0.801	67.1	E
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.854	15.1	B
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	EB Left	0.423	22.2	C
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	SB Left	0.624	34.7	D
8	Project East Dwy (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	EB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

19.1
B
0.760

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	三			三			三			三		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	735	96	199	1403	19	24	23	27	139	26	188
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	22	0	10	0	0	0	0	22	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	774	122	207	1469	20	25	24	28	167	27	196
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	204	32	54	387	5	7	6	7	44	7	52
Total Analysis Volume [veh/h]	15	815	128	218	1546	21	26	25	29	176	28	206
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	21	11	21	0	11	21	0	17	27	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	33	46	7	38	38	3	5	5	9	11	11
g / C, Green / Cycle	0.03	0.47	0.65	0.10	0.55	0.55	0.04	0.08	0.08	0.13	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.23	0.08	0.06	0.43	0.01	0.01	0.01	0.02	0.10	0.01	0.13
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	47	1676	1040	343	1934	863	73	141	120	226	301	256
d1, Uniform Delay [s]	33.54	12.76	4.56	30.40	12.95	7.42	32.75	30.40	30.55	29.71	25.08	28.38
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.74	1.01	0.24	1.95	3.57	0.05	2.88	0.59	1.03	5.78	0.13	5.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.32	0.49	0.12	0.64	0.80	0.02	0.35	0.18	0.24	0.78	0.09	0.80
d, Delay for Lane Group [s/veh]	37.28	13.77	4.81	32.36	16.51	7.48	35.63	30.99	31.58	35.49	25.21	34.24
Lane Group LOS	D	B	A	C	B	A	D	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.28	3.54	0.45	1.67	7.57	0.12	0.46	0.39	0.46	2.99	0.37	3.44
50th-Percentile Queue Length [ft/ln]	6.89	88.58	11.14	41.67	189.25	2.89	11.44	9.73	11.53	74.77	9.36	86.08
95th-Percentile Queue Length [veh/ln]	0.50	6.38	0.80	3.00	12.08	0.21	0.82	0.70	0.83	5.38	0.67	6.20
95th-Percentile Queue Length [ft/ln]	12.39	159.44	20.06	75.00	302.06	5.20	20.60	17.52	20.75	134.59	16.85	154.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.28	13.77	4.81	32.36	16.51	7.48	35.63	30.99	31.58	35.49	25.21	34.24
Movement LOS	D	B	A	C	B	A	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	12.94			18.34			32.71			34.16		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	19.10											
Intersection LOS	B											
Intersection V/C	0.760											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	24.86			24.86			0.00			24.86		
I_p,int, Pedestrian LOS Score for Intersection	3.246			3.303			0.000			2.514		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	486			486			486			657		
d_b, Bicycle Delay [s]	20.06			20.06			20.06			15.78		
I_b,int, Bicycle LOS Score for Intersection	2.350			3.032			1.692			2.236		
Bicycle LOS	B			C			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

25.8
C
0.852

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	83	735	7	5	1374	189	102	1	82	13	11	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	141	0	0	0	0	121	120	0	142	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	227	764	7	5	1429	318	226	1	227	14	11	11
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	197	2	1	369	82	58	0	59	4	3	3
Total Analysis Volume [veh/h]	234	788	7	5	1475	328	233	1	234	14	11	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	30	0	11	24	0	28	38	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	56	56	1	43	43	14	16	16	2	4	4
g / C, Green / Cycle	0.14	0.62	0.62	0.01	0.48	0.48	0.15	0.17	0.17	0.02	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.13	0.22	0.00	0.00	0.41	0.21	0.13	0.00	0.15	0.01	0.01	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	258	2193	979	18	1713	765	276	323	275	43	78	67
d1, Uniform Delay [s]	37.98	8.55	6.68	44.33	20.73	15.30	37.06	30.87	36.18	43.31	41.64	41.69
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	11.63	0.46	0.01	8.41	5.95	1.76	6.98	0.00	7.33	4.39	0.81	1.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.91	0.36	0.01	0.28	0.86	0.43	0.84	0.00	0.85	0.33	0.14	0.17
d, Delay for Lane Group [s/veh]	49.61	9.01	6.70	52.74	26.68	17.06	44.04	30.88	43.51	47.70	42.45	42.84
Lane Group LOS	D	A	A	D	C	B	D	C	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.52	2.95	0.04	0.15	12.67	4.07	5.25	0.02	5.27	0.35	0.24	0.25
50th-Percentile Queue Length [ft/ln]	137.92	73.81	1.07	3.64	316.72	101.67	131.34	0.44	131.66	8.66	6.09	6.19
95th-Percentile Queue Length [veh/ln]	9.37	5.31	0.08	0.26	18.51	7.32	9.01	0.03	9.03	0.62	0.44	0.45
95th-Percentile Queue Length [ft/ln]	234.22	132.86	1.92	6.55	462.65	183.01	225.32	0.79	225.75	15.60	10.96	11.14

Movement, Approach, & Intersection Results

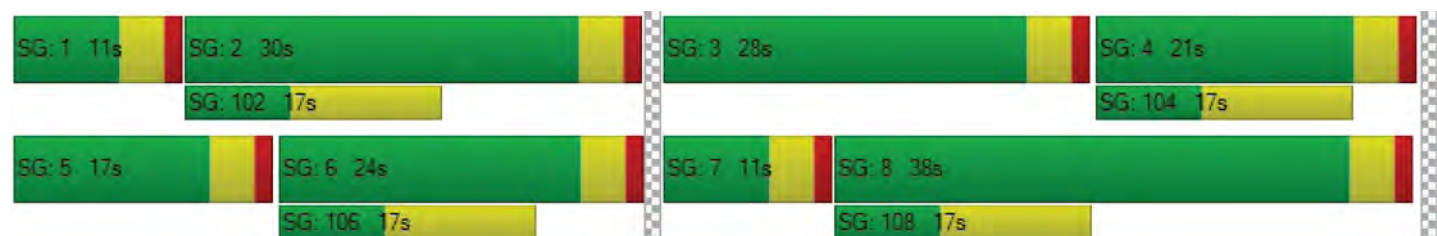
d_M, Delay for Movement [s/veh]	49.61	9.01	6.70	52.74	26.68	17.06	44.04	30.88	43.51	47.70	42.45	42.84
Movement LOS	D	A	A	D	C	B	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	18.22			25.00			43.75			44.61		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	25.75											
Intersection LOS	C											
Intersection V/C	0.852											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	3.272			3.298			2.604			2.314		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	578			444			756			378		
d_b, Bicycle Delay [s]	22.76			27.22			17.42			29.61		
I_b,int, Bicycle LOS Score for Intersection	2.409			3.051			1.946			1.619		
Bicycle LOS	B			C			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	19.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.156

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	781	39	0	1463	4	0	0	38	0	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.00	1.04	1.04	1.00	1.00	1.04	1.00	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	34	0	0	51	3	0	0	0	0	0	18
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	846	41	0	1573	7	0	0	40	0	0	66
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	238	12	0	442	2	0	0	11	0	0	19
Total Analysis Volume [veh/h]	0	951	46	0	1767	8	0	0	45	0	0	74
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.16	0.00	0.00	0.14
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.76	0.00	0.00	12.80
Movement LOS		A	A		A	A			C			B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.48
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.61	0.00	0.00	11.93
d_A, Approach Delay [s/veh]	0.00			0.00			19.76			12.80		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	0.64											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	67.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	22	0	29	22	0	0	0	0	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	382	698	64	85	1292	196	135	249	739	119	388	21
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	185	17	23	343	52	36	66	196	32	103	6
Total Analysis Volume [veh/h]	405	740	68	90	1370	208	143	264	784	126	411	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	29	27	0	46	44	0	13	30	30	12	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	58	58	7	40	40	9	26	55	8	25
g / C, Green / Cycle	0.22	0.50	0.50	0.06	0.35	0.35	0.08	0.23	0.48	0.07	0.22
(v / s)_i Volume / Saturation Flow Rate	0.23	0.22	0.22	0.05	0.38	0.13	0.08	0.14	0.49	0.07	0.23
s, saturation flow rate [veh/h]	1781	1870	1815	1781	3560	1589	1781	1870	1589	1781	1853
c, Capacity [veh/h]	387	938	910	116	1243	555	140	420	758	124	400
d1, Uniform Delay [s]	45.02	18.31	18.32	52.96	37.44	28.04	53.02	40.26	30.09	53.52	45.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.44	1.48	1.53	10.56	58.27	1.93	41.88	1.55	24.98	41.55	46.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.05	0.44	0.44	0.78	1.10	0.37	1.02	0.63	1.03	1.02	1.08
d, Delay for Lane Group [s/veh]	79.46	19.79	19.84	63.52	95.71	29.97	94.90	41.81	55.07	95.07	91.85
Lane Group LOS	F	B	B	E	F	C	F	D	F	F	F
Critical Lane Group	No	No	No	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	14.09	6.64	6.47	2.79	26.10	4.32	5.54	6.69	24.28	4.92	16.16
50th-Percentile Queue Length [ft/ln]	352.14	165.99	161.79	69.77	652.43	107.92	138.55	167.33	607.11	123.00	404.06
95th-Percentile Queue Length [veh/ln]	20.75	10.87	10.64	5.02	36.78	7.72	9.48	10.94	33.22	8.60	23.75
95th-Percentile Queue Length [ft/ln]	518.66	271.64	266.09	125.58	919.38	193.10	237.02	273.41	830.45	215.02	593.66

Movement, Approach, & Intersection Results

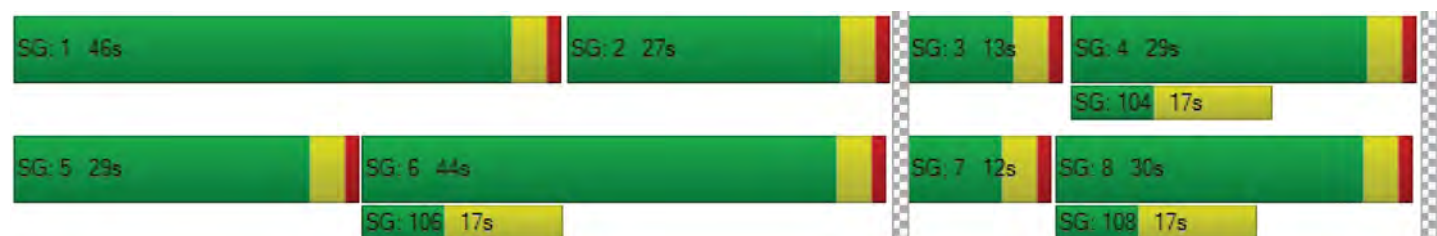
d_M, Delay for Movement [s/veh]	79.46	19.81	19.84	63.52	95.71	29.97	94.90	41.81	55.07	95.07	91.85	91.85
Movement LOS	F	B	B	E	F	C	F	D	F	F	F	F
d_A, Approach Delay [s/veh]	39.73			85.77			56.91			92.58		
Approach LOS	D			F			E			F		
d_I, Intersection Delay [s/veh]	67.11											
Intersection LOS	E											
Intersection V/C	0.801											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	47.03			47.03			47.03			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.560			3.231			2.953			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	400			696			452			435		
d_b, Bicycle Delay [s]	36.80			24.46			34.44			35.22		
I_b,int, Bicycle LOS Score for Intersection	2.560			2.936			3.525			2.482		
Bicycle LOS	B			C			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	15.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	757	167	343	1688	0	0	0	0	329	0	341
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.04	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	0	12	10	0	0	0	0	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	797	174	369	1766	0	0	0	0	342	0	367
Peak Hour Factor	1.0000	0.9490	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	1.0000	0.9490	1.0000	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	210	46	97	465	0	0	0	0	90	0	97
Total Analysis Volume [veh/h]	0	840	183	389	1861	0	0	0	0	360	0	387
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	21	0	23	44	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	65	65	65	65		65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	24	24	17	44		13	33
g / C, Green / Cycle	0.37	0.37	0.25	0.68		0.20	0.51
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.22	0.52		0.10	0.24
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1299	580	453	2424		679	814
d1, Uniform Delay [s]	17.19	14.85	23.16	6.95		23.48	10.24
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	2.49	1.42	4.82	2.40		0.64	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.65	0.32	0.86	0.77		0.53	0.48
d, Delay for Lane Group [s/veh]	19.69	16.27	27.98	9.35		24.13	10.67
Lane Group LOS	B	B	C	A		C	B
Critical Lane Group	No	No	No	Yes		No	Yes
50th-Percentile Queue Length [veh/ln]	5.17	2.00	5.89	6.43		2.40	3.14
50th-Percentile Queue Length [ft/ln]	129.22	50.12	147.13	160.80		60.01	78.48
95th-Percentile Queue Length [veh/ln]	8.90	3.61	9.86	10.59		4.32	5.65
95th-Percentile Queue Length [ft/ln]	222.44	90.21	246.59	264.79		108.02	141.26

Movement, Approach, & Intersection Results

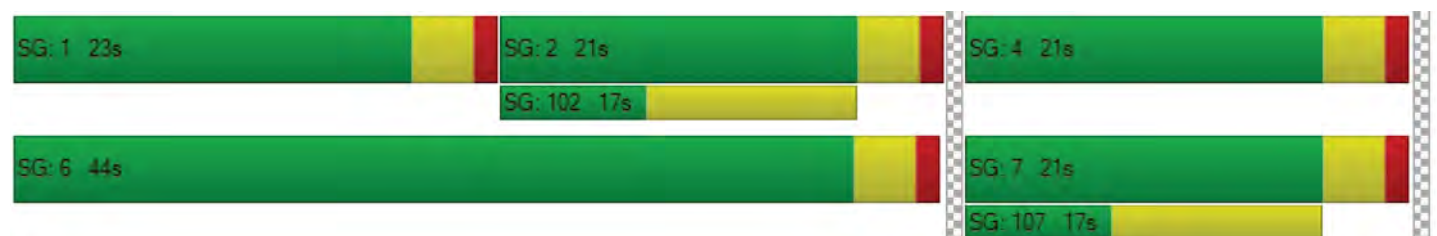
d_M, Delay for Movement [s/veh]	0.00	19.69	16.27	27.98	9.35	0.00	0.00	0.00	0.00	24.13	0.00	10.67
Movement LOS		B	B	C	A					C		B
d_A, Approach Delay [s/veh]	19.08			12.57			0.00			17.16		
Approach LOS	B			B			A			B		
d_I, Intersection Delay [s/veh]	15.08											
Intersection LOS	B											
Intersection V/C	0.854											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			0.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			0.00			0.00			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.914			0.000			0.000			2.435		
Crosswalk LOS	C			F			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			1231			0			0		
d_b, Bicycle Delay [s]	17.72			4.81			32.50			32.50		
I_b,int, Bicycle LOS Score for Intersection	2.404			3.416			4.132			4.132		
Bicycle LOS	B			C			D			D		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.423

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	7	185	53	55	319	20	5	34	31	234	68	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	22	1	0	0	0	15	0	22	14	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	192	77	58	332	21	5	50	32	265	85	193
Peak Hour Factor	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	56	23	17	98	6	1	15	9	78	25	57
Total Analysis Volume [veh/h]	8	226	90	68	390	25	6	59	38	311	100	227
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	18	21	0	22	25	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	75	75	75	75	75	75	75	75	75	75	75	75
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	33	33	5	37	37	1	6	6	15	20	20
g / C, Green / Cycle	0.01	0.43	0.43	0.07	0.49	0.49	0.01	0.08	0.08	0.20	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.00	0.09	0.09	0.04	0.11	0.11	0.00	0.03	0.03	0.17	0.05	0.14
s, saturation flow rate [veh/h]	1781	1870	1695	1781	1870	1831	1781	1870	1640	1781	1870	1589
c, Capacity [veh/h]	27	809	733	128	915	896	21	153	134	358	506	430
d1, Uniform Delay [s]	36.62	13.25	13.31	33.67	11.04	11.05	36.83	32.57	32.67	29.08	21.14	23.34
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	5.73	0.56	0.65	3.38	0.58	0.60	6.98	1.21	1.61	6.48	0.19	1.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.29	0.20	0.21	0.53	0.23	0.23	0.28	0.32	0.36	0.87	0.20	0.53
d, Delay for Lane Group [s/veh]	42.35	13.81	13.96	37.05	11.63	11.65	43.81	33.78	34.28	35.57	21.33	24.35
Lane Group LOS	D	B	B	D	B	B	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.18	1.55	1.49	1.22	1.76	1.73	0.14	0.84	0.83	5.59	1.26	3.21
50th-Percentile Queue Length [ft/ln]	4.46	38.76	37.13	30.54	43.93	43.35	3.60	20.98	20.71	139.72	31.48	80.23
95th-Percentile Queue Length [veh/ln]	0.32	2.79	2.67	2.20	3.16	3.12	0.26	1.51	1.49	9.47	2.27	5.78
95th-Percentile Queue Length [ft/ln]	8.03	69.76	66.84	54.98	79.07	78.02	6.48	37.76	37.28	236.65	56.66	144.42

Movement, Approach, & Intersection Results

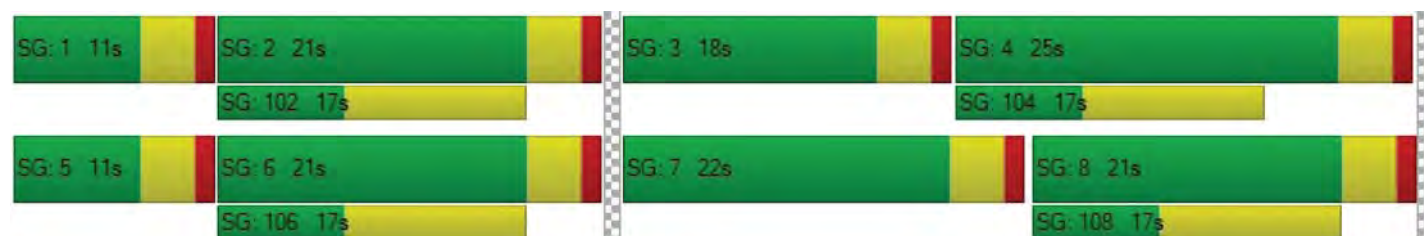
d_M, Delay for Movement [s/veh]	42.35	13.85	13.96	37.05	11.64	11.65	43.81	33.87	34.28	35.57	21.33	24.35
Movement LOS	D	B	B	D	B	B	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	14.58			15.22			34.60			29.34		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	22.20											
Intersection LOS	C											
Intersection V/C	0.423											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	27.31			27.31			27.31			27.31		
I_p,int, Pedestrian LOS Score for Intersection	2.635			2.596			2.359			2.540		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	453			453			453			560		
d_b, Bicycle Delay [s]	22.43			22.43			22.43			19.44		
I_b,int, Bicycle LOS Score for Intersection	1.827			1.958			1.645			2.086		
Bicycle LOS	A			A			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	34.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.624

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	34	0	19	0	0	0	0	159	1	29	278	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	174	7	71	76	0	0	0	0	68
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	20	174	7	71	76	165	1	30	289	68
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	2	5	47	2	19	21	45	0	8	78	18
Total Analysis Volume [veh/h]	38	8	22	189	8	77	82	179	1	33	313	74
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.03	0.02	0.62	0.03	0.09	0.07	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	17.51	19.18	10.50	34.74	17.57	10.12	8.31	0.00	0.00	7.65	0.00	0.00
Movement LOS	C	C	B	D	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.58	0.58	0.58	3.91	0.41	0.41	0.23	0.00	0.00	0.07	0.00	0.00
95th-Percentile Queue Length [ft/ln]	14.60	14.60	14.60	97.69	10.25	10.25	5.65	0.00	0.00	1.82	0.00	0.00
d_A, Approach Delay [s/veh]	15.44			27.32			2.60			0.60		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	9.25											
Intersection LOS	D											

Intersection Level Of Service Report**Intersection 8: Project East Dwy (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration					T	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	185	283	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	88	0	0	174	68	194
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	0	0	366	362	194
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	0	96	95	51
Total Analysis Volume [veh/h]	88	0	0	385	381	204
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS				A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\PME.vistro

Scenario 4 Existing Plus Ambient Growth Plus Project PM
Peak Hour

Report File: C:\...\PMEAP.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	EB Left	0.857	26.4	C
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.742	20.3	C
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	WB Right	0.186	20.5	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	EB Left	1.074	62.2	E
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	WB Right	0.820	35.3	D
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	EB Left	0.376	18.7	B
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	SB Left	0.421	23.7	C
8	Project East Dwy (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	WB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

26.4
C
0.857

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	20	1358	132	205	859	21	7	17	17	125	26	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	16	0	8	0	0	0	0	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	1420	153	213	901	22	7	18	18	146	27	376
Peak Hour Factor	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	357	38	54	227	6	2	5	5	37	7	95
Total Analysis Volume [veh/h]	21	1429	154	214	906	22	7	18	18	147	27	378
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	31	44	44	11	24	0	13	21	0	14	22	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	43	56	7	47	47	1	15	15	9	23	23
g / C, Green / Cycle	0.03	0.47	0.62	0.08	0.52	0.52	0.01	0.17	0.17	0.10	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.01	0.40	0.10	0.06	0.25	0.01	0.00	0.01	0.01	0.08	0.01	0.24
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	58	1687	986	270	1850	826	23	316	268	181	482	409
d1, Uniform Delay [s]	42.69	20.83	7.20	40.82	13.95	10.54	44.07	31.43	31.49	39.61	25.19	32.58
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.83	5.47	0.34	5.24	0.93	0.06	7.21	0.07	0.10	8.37	0.05	9.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.36	0.85	0.16	0.79	0.49	0.03	0.30	0.06	0.07	0.81	0.06	0.92
d, Delay for Lane Group [s/veh]	46.52	26.30	7.54	46.06	14.88	10.60	51.28	31.51	31.59	47.98	25.24	41.62
Lane Group LOS	D	C	A	D	B	B	D	C	C	D	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.49	12.19	1.03	2.37	5.10	0.19	0.19	0.32	0.32	3.45	0.42	8.47
50th-Percentile Queue Length [ft/ln]	12.26	304.83	25.73	59.21	127.43	4.80	4.87	7.99	8.03	86.28	10.43	211.65
95th-Percentile Queue Length [veh/ln]	0.88	17.92	1.85	4.26	8.80	0.35	0.35	0.58	0.58	6.21	0.75	13.24
95th-Percentile Queue Length [ft/ln]	22.06	447.99	46.31	106.58	220.00	8.64	8.76	14.38	14.46	155.30	18.78	330.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.52	26.30	7.54	46.06	14.88	10.60	51.28	31.51	31.59	47.98	25.24	41.62
Movement LOS	D	C	A	D	B	B	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	24.76			20.64			34.76			42.51		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	26.41											
Intersection LOS	C											
Intersection V/C	0.857											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	34.67			34.67			0.00			34.67		
I_p,int, Pedestrian LOS Score for Intersection	3.249			3.348			0.000			2.574		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	889			444			378			400		
d_b, Bicycle Delay [s]	13.89			27.22			29.61			28.80		
I_b,int, Bicycle LOS Score for Intersection	2.883			2.502			1.631			2.470		
Bicycle LOS	C			B			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

20.3
C
0.742

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	230	1422	25	6	928	66	88	9	74	11	4	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	98	0	0	0	0	83	83	0	101	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	337	1479	26	6	965	152	175	9	178	11	4	3
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	379	7	2	247	39	45	2	46	3	1	1
Total Analysis Volume [veh/h]	346	1517	27	6	990	156	179	9	183	11	4	3
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	31	0	13	21	0	15	25	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	50	50	1	34	34	10	11	11	2	3	3
g / C, Green / Cycle	0.22	0.63	0.63	0.01	0.42	0.42	0.12	0.14	0.14	0.02	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.19	0.43	0.02	0.00	0.28	0.10	0.10	0.00	0.12	0.01	0.00	0.00
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	388	2233	997	21	1500	670	219	264	225	36	72	61
d1, Uniform Delay [s]	30.45	9.71	5.67	39.29	18.60	14.89	34.30	29.71	33.41	38.75	37.15	37.14
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	7.21	1.69	0.05	7.13	2.29	0.81	7.32	0.05	7.02	4.78	0.32	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.89	0.68	0.03	0.28	0.66	0.23	0.82	0.03	0.81	0.31	0.06	0.05
d, Delay for Lane Group [s/veh]	37.66	11.40	5.72	46.42	20.89	15.70	41.62	29.76	40.43	43.53	37.47	37.47
Lane Group LOS	D	B	A	D	C	B	D	C	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.53	6.13	0.13	0.15	6.52	1.68	3.62	0.14	3.65	0.25	0.08	0.06
50th-Percentile Queue Length [ft/ln]	163.29	153.25	3.26	3.75	163.09	41.92	90.56	3.61	91.37	6.23	1.95	1.48
95th-Percentile Queue Length [veh/ln]	10.72	10.19	0.23	0.27	10.71	3.02	6.52	0.26	6.58	0.45	0.14	0.11
95th-Percentile Queue Length [ft/ln]	268.08	254.76	5.87	6.75	267.81	75.45	163.01	6.50	164.47	11.22	3.50	2.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.66	11.40	5.72	46.42	20.89	15.70	41.62	29.76	40.43	43.53	37.47	37.47
Movement LOS	D	B	A	D	C	B	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	16.12			20.32			40.75			41.17		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	20.33											
Intersection LOS	C											
Intersection V/C	0.742											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			29.76			29.76		
I_p,int, Pedestrian LOS Score for Intersection	3.362			3.296			2.550			2.311		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	675			425			525			425		
d_b, Bicycle Delay [s]	17.56			24.81			21.76			24.81		
I_b,int, Bicycle LOS Score for Intersection	3.119			2.510			1.866			1.589		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	20.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.186

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1607	159	0	1019	11	0	0	44	0	0	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.00	1.04	1.04	1.00	1.00	1.04	1.00	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	26	0	0	39	2	0	0	0	0	0	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1697	165	0	1099	13	0	0	46	0	0	50
Peak Hour Factor	0.8900	0.9500	0.9500	0.8900	0.9500	0.9500	0.8900	0.8900	0.9500	0.8900	0.8900	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	447	43	0	289	3	0	0	12	0	0	13
Total Analysis Volume [veh/h]	0	1786	174	0	1157	14	0	0	48	0	0	53
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.10	0.00	0.00	0.19
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.76	0.00	0.00	20.53
Movement LOS		A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.67
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.71	0.00	0.00	16.78
d_A, Approach Delay [s/veh]	0.00			0.00			13.76			20.53		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	0.54											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	62.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.074

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	22	17	0	0	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	564	1467	86	93	794	179	266	398	615	49	393	17
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	144	375	22	24	203	46	68	102	157	13	101	4
Total Analysis Volume [veh/h]	577	1502	88	95	813	183	272	407	629	50	402	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	39	59	0	11	31	0	21	27	27	23	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	35	55	55	7	27	27	17	36	75	6	25
g / C, Green / Cycle	0.29	0.46	0.46	0.06	0.23	0.23	0.14	0.30	0.63	0.05	0.21
(v / s)_i Volume / Saturation Flow Rate	0.32	0.43	0.43	0.05	0.23	0.12	0.15	0.22	0.40	0.03	0.23
s, saturation flow rate [veh/h]	1781	1870	1834	1781	3560	1589	1781	1870	1589	1781	1857
c, Capacity [veh/h]	519	860	844	104	807	360	252	563	995	84	384
d1, Uniform Delay [s]	42.50	30.45	30.89	56.20	46.41	40.56	51.50	37.47	13.89	56.03	47.60
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	56.50	17.04	19.80	24.41	33.56	5.05	50.04	1.78	0.67	6.48	51.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.11	0.92	0.94	0.91	1.01	0.51	1.08	0.72	0.63	0.59	1.09
d, Delay for Lane Group [s/veh]	99.01	47.49	50.69	80.61	79.96	45.60	101.54	39.25	14.56	62.51	98.62
Lane Group LOS	F	D	D	F	F	D	F	D	B	E	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	22.52	23.44	24.30	3.45	15.13	5.01	10.87	10.53	9.42	1.60	16.50
50th-Percentile Queue Length [ft/ln]	562.97	586.12	607.40	86.28	378.14	125.26	271.76	263.26	235.55	40.05	412.40
95th-Percentile Queue Length [veh/ln]	32.32	31.39	32.38	6.21	21.60	8.68	16.83	15.85	14.46	2.88	24.27
95th-Percentile Queue Length [ft/ln]	807.89	784.64	809.49	155.30	539.95	217.04	420.85	396.31	361.41	72.10	606.70

Movement, Approach, & Intersection Results

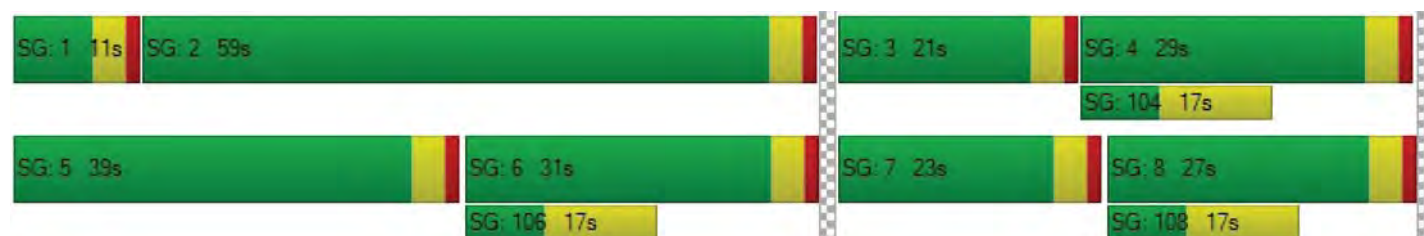
d_M, Delay for Movement [s/veh]	99.01	49.00	50.69	80.61	79.96	45.60	101.54	39.25	14.56	62.51	98.62	98.62
Movement LOS	F	D	D	F	F	D	F	D	B	E	F	F
d_A, Approach Delay [s/veh]	62.38			74.26			40.33			94.77		
Approach LOS	E			E			D			F		
d_I, Intersection Delay [s/veh]	62.24											
Intersection LOS	E											
Intersection V/C	1.074											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.622			3.325			3.048			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	917			450			383			417		
d_b, Bicycle Delay [s]	17.60			36.04			39.20			37.60		
I_b,int, Bicycle LOS Score for Intersection	3.347			2.460			3.718			2.333		
Bicycle LOS	C			B			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	35.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.820

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1474	348	389	1008	0	0	0	0	289	0	702
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.04	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	9	8	0	0	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1541	362	414	1056	0	0	0	0	301	0	739
Peak Hour Factor	1.0000	0.9630	0.9630	0.9630	0.9630	1.0000	1.0000	1.0000	1.0000	0.9630	1.0000	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	400	94	107	274	0	0	0	0	78	0	192
Total Analysis Volume [veh/h]	0	1600	376	430	1097	0	0	0	0	313	0	767
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	50	0	29	79	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	100	100	100	100		100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	46	46	25	75		17	46
g / C, Green / Cycle	0.46	0.46	0.25	0.75		0.17	0.46
(v / s)_i Volume / Saturation Flow Rate	0.45	0.24	0.24	0.31		0.09	0.48
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1636	730	446	2669		590	732
d1, Uniform Delay [s]	26.60	19.18	37.15	4.54		37.92	27.04
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	17.60	2.58	13.09	0.47		0.74	29.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.98	0.51	0.96	0.41		0.53	1.05
d, Delay for Lane Group [s/veh]	44.20	21.77	50.24	5.01		38.67	56.78
Lane Group LOS	D	C	D	A		D	F
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	21.64	6.50	11.81	3.40		3.54	22.52
50th-Percentile Queue Length [ft/ln]	541.04	162.62	295.22	85.10		88.39	562.90
95th-Percentile Queue Length [veh/ln]	29.27	10.69	17.44	6.13		6.36	31.36
95th-Percentile Queue Length [ft/ln]	731.77	267.18	436.12	153.18		159.11	784.08

Movement, Approach, & Intersection Results

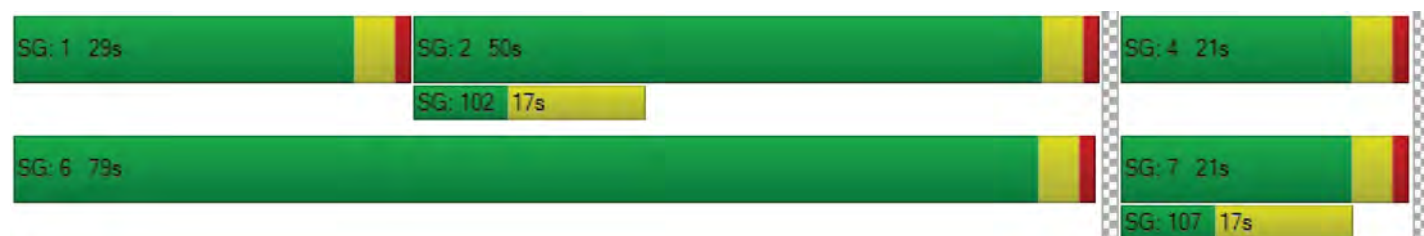
d_M, Delay for Movement [s/veh]	0.00	44.20	21.77	50.24	5.01	0.00	0.00	0.00	0.00	38.67	0.00	56.78
Movement LOS		D	C	D	A					D		F
d_A, Approach Delay [s/veh]	39.93			17.75			0.00			51.53		
Approach LOS	D			B			A			D		
d_I, Intersection Delay [s/veh]	35.27											
Intersection LOS	D											
Intersection V/C	0.820											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		0.0		0.0		11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	39.61		0.00		0.00		39.61
I_p,int, Pedestrian LOS Score for Intersection	2.965		0.000		0.000		2.596
Crosswalk LOS	C		F		F		B
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	920		1500		0		0
d_b, Bicycle Delay [s]	14.58		3.13		50.00		50.00
I_b,int, Bicycle LOS Score for Intersection	3.190		2.819		4.132		4.132
Bicycle LOS	C		C		D		D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	18.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.376

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	33	177	167	70	149	4	5	30	40	86	52	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	1	0	0	0	11	0	16	11	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	184	190	74	155	4	5	42	42	105	65	69
Peak Hour Factor	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	53	55	21	45	1	1	12	12	30	19	20
Total Analysis Volume [veh/h]	39	212	219	85	179	5	6	48	48	121	75	80
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	12	21	0	12	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	31	31	6	33	33	1	6	6	6	11	11
g / C, Green / Cycle	0.06	0.48	0.48	0.09	0.51	0.51	0.01	0.09	0.09	0.10	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.14	0.05	0.05	0.05	0.00	0.03	0.03	0.07	0.04	0.05
s, saturation flow rate [veh/h]	1781	1870	1589	1781	1870	1852	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	100	902	767	153	958	949	22	167	142	173	326	277
d1, Uniform Delay [s]	29.70	9.85	10.13	28.61	8.16	8.17	31.92	27.74	27.87	28.53	23.17	23.42
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	2.46	0.61	0.94	3.12	0.20	0.20	6.64	0.93	1.39	5.09	0.36	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.39	0.24	0.29	0.56	0.10	0.10	0.28	0.29	0.34	0.70	0.23	0.29
d, Delay for Lane Group [s/veh]	32.16	10.47	11.07	31.73	8.36	8.37	38.56	28.68	29.26	33.62	23.53	23.99
Lane Group LOS	C	B	B	C	A	A	D	C	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.60	1.48	1.61	1.27	0.54	0.54	0.13	0.68	0.69	1.90	0.92	1.00
50th-Percentile Queue Length [ft/ln]	14.96	36.99	40.21	31.77	13.47	13.42	3.16	16.98	17.34	47.57	23.03	25.06
95th-Percentile Queue Length [veh/ln]	1.08	2.66	2.89	2.29	0.97	0.97	0.23	1.22	1.25	3.43	1.66	1.80
95th-Percentile Queue Length [ft/ln]	26.93	66.58	72.37	57.19	24.24	24.16	5.69	30.57	31.22	85.63	41.46	45.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.16	10.47	11.07	31.73	8.37	8.37	38.56	28.68	29.26	33.62	23.53	23.99
Movement LOS	C	B	B	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	12.55			15.75			29.53			28.09		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	18.71											
Intersection LOS	B											
Intersection V/C	0.376											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.548			2.466			2.347			2.466		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			523			523			523		
d_b, Bicycle Delay [s]	17.72			17.72			17.72			17.72		
I_b,int, Bicycle LOS Score for Intersection	1.947			1.782			1.644			1.787		
Bicycle LOS	A			A			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	23.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	9	0	10	0	0	0	0	194	13	47	238	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	125	5	52	54	0	0	0	0	47
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	5	10	125	5	52	54	202	14	49	248	47
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	3	34	1	14	15	56	4	13	68	13
Total Analysis Volume [veh/h]	10	6	11	138	6	57	59	222	15	54	273	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.01	0.42	0.02	0.07	0.05	0.00	0.00	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	16.36	17.68	9.50	23.75	17.30	9.68	8.07	0.00	0.00	7.83	0.00	0.00
Movement LOS	C	C	A	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.20	0.20	0.20	2.01	0.28	0.28	0.15	0.00	0.00	0.13	0.00	0.00
95th-Percentile Queue Length [ft/ln]	4.96	4.96	4.96	50.30	7.08	7.08	3.77	0.00	0.00	3.18	0.00	0.00
d_A, Approach Delay [s/veh]	13.86			19.57			1.61			1.12		
Approach LOS	B			C			A			A		
d_I, Intersection Delay [s/veh]	5.77											
Intersection LOS	C											

Intersection Level Of Service Report**Intersection 8: Project East Dwy (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration					T	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	171	300	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	59	0	0	125	47	134
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	0	0	303	359	134
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	0	0	80	94	35
Total Analysis Volume [veh/h]	59	0	0	319	378	141
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS				A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro

Scenario 5 Existing Plus Ambient Growth Plus Project AM
Peak Hour - With Improvements

Report File: C:\...\AMEAPI.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	WB Left	0.788	54.9	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	54.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	TWO			TWO			TWO			TWO		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	22	0	29	22	0	0	0	0	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	382	698	64	85	1292	196	135	249	739	119	388	21
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	185	17	23	343	52	36	66	196	32	103	6
Total Analysis Volume [veh/h]	405	740	68	90	1370	208	143	264	784	126	411	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	20	20	0	40	40	0	19	29	29	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	16	46	46	7	36	36	7	25	45	7	25
g / C, Green / Cycle	0.16	0.46	0.46	0.07	0.36	0.36	0.07	0.25	0.45	0.07	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.21	0.04	0.05	0.38	0.13	0.04	0.14	0.49	0.07	0.23
s, saturation flow rate [veh/h]	3459	3560	1589	1781	3560	1589	3459	1870	1589	1781	1853
c, Capacity [veh/h]	554	1627	727	117	1292	577	238	462	711	125	460
d1, Uniform Delay [s]	39.97	18.61	15.40	45.98	31.87	23.36	45.24	33.02	27.66	46.52	36.88
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.89	0.92	0.26	9.98	42.72	1.75	2.42	1.12	51.72	39.74	9.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.45	0.09	0.77	1.06	0.36	0.60	0.57	1.10	1.01	0.94
d, Delay for Lane Group [s/veh]	41.86	19.53	15.66	55.96	74.60	25.11	47.67	34.14	79.38	86.26	46.70
Lane Group LOS	D	B	B	E	F	C	D	C	F	F	D
Critical Lane Group	No	No	No	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	4.58	5.38	0.84	2.40	21.55	3.56	1.74	5.47	25.35	4.37	11.03
50th-Percentile Queue Length [ft/ln]	114.39	134.53	20.96	60.12	538.86	88.95	43.60	136.83	633.79	109.22	275.80
95th-Percentile Queue Length [veh/ln]	8.08	9.19	1.51	4.33	30.35	6.40	3.14	9.31	36.06	7.82	16.48
95th-Percentile Queue Length [ft/ln]	202.09	229.63	37.73	108.22	758.82	160.12	78.48	232.75	901.51	195.47	411.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.86	19.53	15.66	55.96	74.60	25.11	47.67	34.14	79.38	86.26	46.70	46.70
Movement LOS	D	B	B	E	F	C	D	C	F	F	D	D
d_A, Approach Delay [s/veh]	26.77			67.42			65.54			55.62		
Approach LOS	C			E			E			E		
d_I, Intersection Delay [s/veh]	54.87											
Intersection LOS	D											
Intersection V/C	0.788											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.491			3.224			2.998			0.000		
Crosswalk LOS	C			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	320			720			500			340		
d_b, Bicycle Delay [s]	35.28			20.48			28.13			34.45		
I_b,int, Bicycle LOS Score for Intersection	2.560			2.936			3.525			2.482		
Bicycle LOS	B			C			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Winchester at Jean Nicholas Commercial

Vistro File: C:\...\PME.vistro

Scenario 5 Existing Plus Ambient Growth Plus Project PM
Peak Hour - With Improvements

Report File: C:\...\PMEAPI.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	SB Left	0.986	37.4	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	37.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.986

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	22	17	0	0	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	564	1467	86	93	794	179	266	398	615	49	393	17
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	144	375	22	24	203	46	68	102	157	13	101	4
Total Analysis Volume [veh/h]	577	1502	88	95	813	183	272	407	629	50	402	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	22	11	0	42	31	0	12	26	26	11	25	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	18	39	39	6	27	27	8	24	46	5	21
g / C, Green / Cycle	0.20	0.43	0.43	0.07	0.30	0.30	0.09	0.27	0.51	0.06	0.23
(v / s)_i Volume / Saturation Flow Rate	0.17	0.42	0.06	0.05	0.23	0.12	0.08	0.22	0.40	0.03	0.23
s, saturation flow rate [veh/h]	3459	3560	1589	1781	3560	1589	3459	1870	1589	1781	1857
c, Capacity [veh/h]	692	1534	685	126	1073	479	308	496	810	99	431
d1, Uniform Delay [s]	34.58	25.23	15.44	41.06	28.47	24.82	40.55	31.07	17.91	41.30	34.30
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.73	18.57	0.39	8.79	5.01	2.30	8.33	3.44	1.64	3.93	14.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.98	0.13	0.75	0.76	0.38	0.88	0.82	0.78	0.50	0.97
d, Delay for Lane Group [s/veh]	37.30	43.80	15.83	49.86	33.48	27.13	48.88	34.51	19.55	45.23	49.05
Lane Group LOS	D	D	B	D	C	C	D	C	B	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	5.80	17.24	1.03	2.24	7.84	3.09	3.19	8.17	9.40	1.14	10.22
50th-Percentile Queue Length [ft/ln]	144.90	431.02	25.66	55.90	195.97	77.27	79.80	204.21	235.05	28.49	255.46
95th-Percentile Queue Length [veh/ln]	9.74	24.05	1.85	4.02	12.43	5.56	5.75	12.86	14.43	2.05	15.46
95th-Percentile Queue Length [ft/ln]	243.61	601.26	46.19	100.62	310.76	139.08	143.64	321.39	360.77	51.28	386.53

Movement, Approach, & Intersection Results

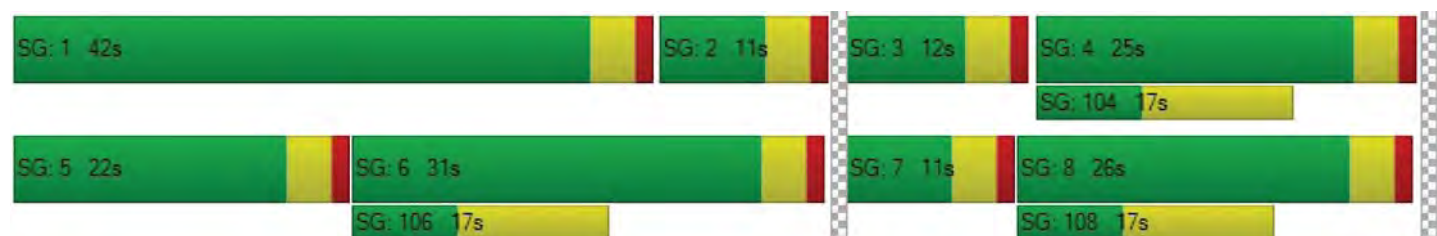
d_M, Delay for Movement [s/veh]	37.30	43.80	15.83	49.86	33.48	27.13	48.88	34.51	19.55	45.23	49.05	49.05
Movement LOS	D	D	B	D	C	C	D	C	B	D	D	D
d_A, Approach Delay [s/veh]	40.93			33.84			30.31			48.64		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	37.35											
Intersection LOS	D											
Intersection V/C	0.986											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	34.67			34.67			34.67			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.528			3.311			3.054			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	156			600			489			467		
d_b, Bicycle Delay [s]	38.27			22.05			25.69			26.45		
I_b,int, Bicycle LOS Score for Intersection	3.347			2.460			3.718			2.333		
Bicycle LOS	C			B			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Existing Plus Ambient Plus Project Plus Cumulative

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro

Scenario 6 Existing Plus Ambient Growth Plus Project Plus
Cumulative AM Peak Hour

Report File: C:\...\AMEAPC.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	NB Left	0.793	23.0	C
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.901	35.1	D
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	EB Right	0.259	24.0	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	SB Thru	1.144	84.2	F
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.894	16.2	B
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	NB Left	0.512	23.5	C
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	SB Left	0.855	67.0	F
8	Project East Dwy (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	EB Thru	0.005	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:	Signalized	Delay (sec / veh):	23.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.793

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T			T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	735	96	199	1403	19	24	23	27	139	26	188
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	39	29	2	80	7	21	0	38	37	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	803	129	209	1539	27	46	24	66	182	27	202
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	211	34	55	405	7	12	6	17	48	7	53
Total Analysis Volume [veh/h]	33	845	136	220	1620	28	48	25	69	192	28	213
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	28	28	11	28	0	11	21	0	20	30	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	40	54	7	43	43	5	7	7	11	13	13
g / C, Green / Cycle	0.05	0.49	0.68	0.09	0.53	0.53	0.06	0.09	0.09	0.13	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.02	0.24	0.09	0.06	0.45	0.02	0.03	0.01	0.04	0.11	0.01	0.13
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	83	1753	1076	303	1898	847	104	161	137	240	303	258
d1, Uniform Delay [s]	37.13	13.56	4.58	35.66	16.05	8.90	36.52	33.95	35.01	33.66	28.58	32.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.03	0.95	0.24	3.34	5.13	0.07	3.13	0.44	2.85	6.09	0.13	6.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.40	0.48	0.13	0.73	0.85	0.03	0.46	0.16	0.50	0.80	0.09	0.83
d, Delay for Lane Group [s/veh]	40.16	14.51	4.82	39.00	21.18	8.98	39.65	34.39	37.87	39.75	28.71	39.13
Lane Group LOS	D	B	A	D	C	A	D	C	D	D	C	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.65	4.25	0.54	2.05	10.77	0.20	0.95	0.45	1.32	3.79	0.44	4.19
50th-Percentile Queue Length [ft/ln]	16.21	106.17	13.55	51.35	269.20	4.94	23.72	11.13	32.97	94.65	11.00	104.66
95th-Percentile Queue Length [veh/ln]	1.17	7.63	0.98	3.70	16.15	0.36	1.71	0.80	2.37	6.81	0.79	7.54
95th-Percentile Queue Length [ft/ln]	29.19	190.66	24.38	92.42	403.74	8.89	42.70	20.03	59.35	170.37	19.80	188.38

Movement, Approach, & Intersection Results

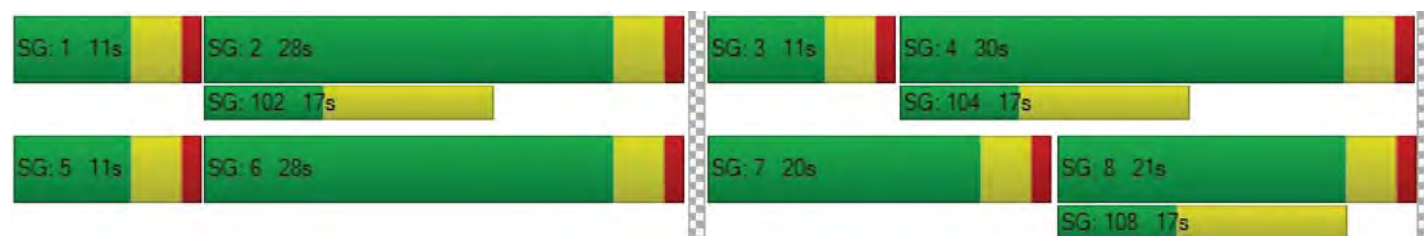
d_M, Delay for Movement [s/veh]	40.16	14.51	4.82	39.00	21.18	8.98	39.65	34.39	37.87	39.75	28.71	39.13
Movement LOS	D	B	A	D	C	A	D	C	D	D	C	D
d_A, Approach Delay [s/veh]	14.04			23.10			37.86			38.73		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	23.01											
Intersection LOS	C											
Intersection V/C	0.793											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	29.76			29.76			0.00			29.76		
I_p,int, Pedestrian LOS Score for Intersection	3.309			3.347			0.000			2.531		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			600			425			650		
d_b, Bicycle Delay [s]	19.60			19.60			24.81			18.23		
I_b,int, Bicycle LOS Score for Intersection	2.396			3.101			1.794			2.274		
Bicycle LOS	B			C			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):

35.1
D
0.901

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	83	735	7	5	1374	189	102	1	82	13	11	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	163	32	8	9	88	147	138	3	194	4	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	249	796	15	14	1517	344	244	4	279	18	11	14
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	205	4	4	391	89	63	1	72	5	3	4
Total Analysis Volume [veh/h]	257	821	15	14	1566	355	252	4	288	19	11	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	22	29	0	43	50	0	22	32	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	70	70	3	55	55	18	23	23	3	8	8
g / C, Green / Cycle	0.16	0.61	0.61	0.02	0.48	0.48	0.16	0.20	0.20	0.03	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.14	0.23	0.01	0.01	0.44	0.22	0.14	0.00	0.18	0.01	0.01	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	279	2171	969	40	1694	756	279	374	318	51	134	114
d1, Uniform Delay [s]	47.86	11.39	8.85	55.45	28.25	20.38	47.71	36.93	45.00	54.95	49.91	50.05
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	12.11	0.50	0.03	5.02	10.03	2.09	10.46	0.01	9.55	4.53	0.26	0.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.92	0.38	0.02	0.35	0.92	0.47	0.90	0.01	0.91	0.38	0.08	0.12
d, Delay for Lane Group [s/veh]	59.97	11.90	8.88	60.47	38.28	22.46	58.17	36.94	54.55	59.48	50.16	50.53
Lane Group LOS	E	B	A	E	D	C	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.83	4.64	0.14	0.44	20.13	6.25	7.68	0.09	8.59	0.59	0.30	0.38
50th-Percentile Queue Length [ft/ln]	195.73	116.12	3.38	11.02	503.33	156.26	191.98	2.24	214.72	14.80	7.47	9.60
95th-Percentile Queue Length [veh/ln]	12.42	8.18	0.24	0.79	27.49	10.35	12.22	0.16	13.40	1.07	0.54	0.69
95th-Percentile Queue Length [ft/ln]	310.45	204.49	6.09	19.83	687.29	258.76	305.60	4.02	334.88	26.64	13.44	17.28

Movement, Approach, & Intersection Results

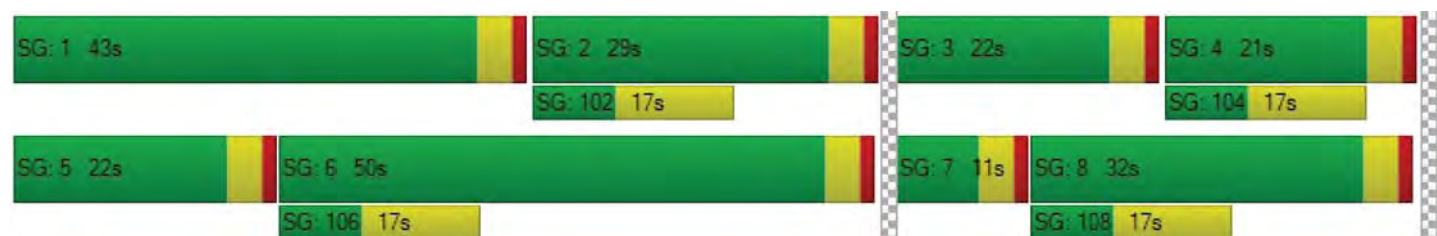
d_M, Delay for Movement [s/veh]	59.97	11.90	8.88	60.47	38.28	22.46	58.17	36.94	54.55	59.48	50.16	50.53
Movement LOS	E	B	A	E	D	C	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.16			35.54			56.10			54.30		
Approach LOS	C			D			E			D		
d_I, Intersection Delay [s/veh]	35.12											
Intersection LOS	D											
Intersection V/C	0.901											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	47.03			47.03			47.03			47.03		
I_p,int, Pedestrian LOS Score for Intersection	3.348			3.365			2.653			2.334		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	435			800			487			296		
d_b, Bicycle Delay [s]	35.22			20.70			32.91			41.76		
I_b,int, Bicycle LOS Score for Intersection	2.461			3.156			2.008			1.632		
Bicycle LOS	B			C			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.259

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	781	39	0	1463	4	0	0	38	0	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.00	1.04	1.04	1.00	1.00	1.04	1.00	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	93	6	0	194	3	0	0	19	0	0	21
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	905	47	0	1716	7	0	0	59	0	0	69
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	254	13	0	482	2	0	0	17	0	0	19
Total Analysis Volume [veh/h]	0	1017	53	0	1928	8	0	0	66	0	0	78
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.26	0.00	0.00	0.15
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.95	0.00	0.00	13.34
Movement LOS		A	A		A	A			C			B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.54
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.09	0.00	0.00	13.42
d_A, Approach Delay [s/veh]	0.00			0.00			23.95			13.34		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	0.83											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	84.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.144

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	64	2	79	115	18	5	27	11	10	33	25
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	394	740	66	135	1385	214	140	276	750	129	421	34
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	104	196	17	36	367	57	37	73	199	34	112	9
Total Analysis Volume [veh/h]	418	785	70	143	1469	227	148	293	795	137	446	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	29	11	0	64	46	0	13	32	32	13	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	55	55	12	42	42	9	28	57	9	28
g / C, Green / Cycle	0.21	0.46	0.46	0.10	0.35	0.35	0.08	0.23	0.47	0.08	0.23
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.23	0.08	0.41	0.14	0.08	0.16	0.50	0.08	0.26
s, saturation flow rate [veh/h]	1781	1870	1817	1781	3560	1589	1781	1870	1589	1781	1846
c, Capacity [veh/h]	371	864	840	174	1251	558	134	434	753	134	428
d1, Uniform Delay [s]	47.52	22.60	22.62	53.16	38.94	29.47	55.52	41.98	31.59	55.52	46.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	65.09	2.07	2.14	9.37	87.27	2.19	69.04	1.84	32.67	42.55	63.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.13	0.50	0.50	0.82	1.17	0.41	1.11	0.68	1.06	1.02	1.13
d, Delay for Lane Group [s/veh]	112.61	24.67	24.76	62.53	126.21	31.66	124.55	43.82	64.26	98.07	109.84
Lane Group LOS	F	C	C	E	F	C	F	D	F	F	F
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	17.20	8.35	8.15	4.51	32.15	5.01	6.51	7.87	26.81	5.52	19.86
50th-Percentile Queue Length [ft/ln]	429.89	208.67	203.83	112.64	803.76	125.19	162.68	196.81	670.14	138.09	496.49
95th-Percentile Queue Length [veh/ln]	25.54	13.09	12.84	7.99	45.98	8.68	11.05	12.47	36.79	9.45	29.01
95th-Percentile Queue Length [ft/ln]	638.60	327.13	320.90	199.67	1149.48	216.94	276.27	311.84	919.86	236.35	725.25

Movement, Approach, & Intersection Results

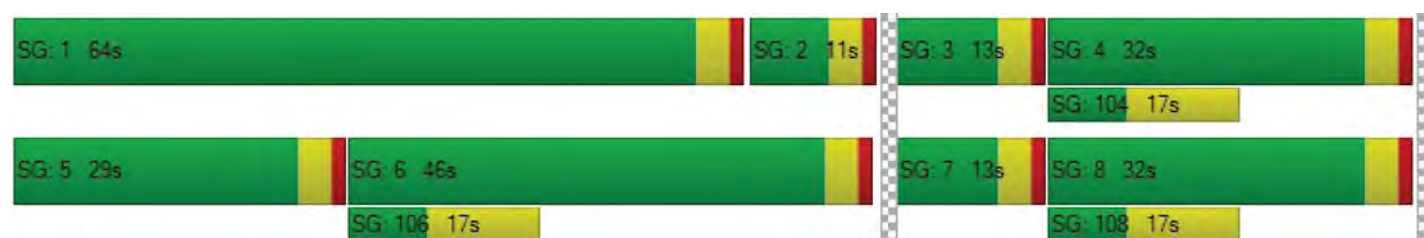
d_M, Delay for Movement [s/veh]	112.61	24.71	24.76	62.53	126.21	31.66	124.55	43.82	64.26	98.07	109.84	109.84
Movement LOS	F	C	C	E	F	C	F	D	F	F	F	F
d_A, Approach Delay [s/veh]	53.58			109.58			66.64			107.23		
Approach LOS	D			F			E			F		
d_I, Intersection Delay [s/veh]	84.25											
Intersection LOS	F											
Intersection V/C	1.144											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.627			3.303			2.996			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	117			700			467			467		
d_b, Bicycle Delay [s]	53.20			25.35			35.27			35.27		
I_b,int, Bicycle LOS Score for Intersection	2.610			3.077			3.599			2.581		
Bicycle LOS	B			C			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.894

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	757	167	343	1688	0	0	0	0	329	0	341
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.04	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	51	19	33	103	0	0	0	0	31	0	27
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	838	193	390	1859	0	0	0	0	373	0	382
Peak Hour Factor	1.0000	0.9490	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	1.0000	0.9490	1.0000	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	221	51	103	490	0	0	0	0	98	0	101
Total Analysis Volume [veh/h]	0	883	203	411	1959	0	0	0	0	393	0	403
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	21	0	23	44	0	0	0	0	21	0	21
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	65	65	65	65		65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	23	23	17	44		13	34
g / C, Green / Cycle	0.35	0.35	0.26	0.68		0.20	0.53
(v / s)_i Volume / Saturation Flow Rate	0.25	0.13	0.23	0.55		0.11	0.25
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1248	557	472	2410		693	837
d1, Uniform Delay [s]	18.27	15.75	22.89	7.56		23.50	9.78
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	3.40	1.84	5.13	3.13		0.73	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.36	0.87	0.81		0.57	0.48
d, Delay for Lane Group [s/veh]	21.67	17.59	28.01	10.69		24.23	10.21
Lane Group LOS	C	B	C	B		C	B
Critical Lane Group	No	No	No	Yes		No	Yes
50th-Percentile Queue Length [veh/ln]	5.78	2.34	6.24	7.49		2.64	3.17
50th-Percentile Queue Length [ft/ln]	144.54	58.57	155.94	187.21		65.90	79.25
95th-Percentile Queue Length [veh/ln]	9.73	4.22	10.33	11.98		4.74	5.71
95th-Percentile Queue Length [ft/ln]	243.13	105.43	258.34	299.41		118.62	142.65

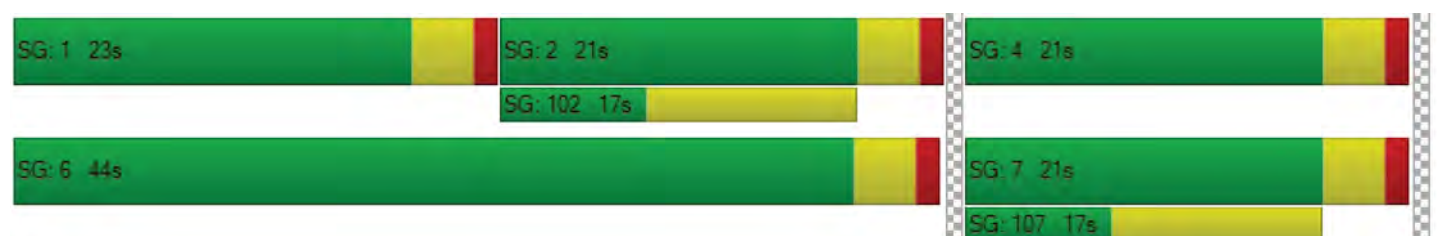
Movement, Approach, & Intersection Results

[illegible]

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	22.43	0.00	0.00	22.43
I_p,int, Pedestrian LOS Score for Intersection	2.952	0.000	0.000	2.457
Crosswalk LOS	C	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	523	1231	0	0
d_b, Bicycle Delay [s]	17.72	4.81	32.50	32.50
I_b,int, Bicycle LOS Score for Intersection	2.456	3.515	4.132	4.132
Bicycle LOS	B	D	D	D

Sequence

[illegible]

Intersection Level Of Service Report
Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	23.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.512

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	185	53	55	319	20	5	34	31	234	68	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	43	33	29	129	43	14	23	0	57	35	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	235	88	86	461	64	19	58	32	300	106	204
Peak Hour Factor	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	69	26	25	135	19	6	17	9	88	31	60
Total Analysis Volume [veh/h]	8	276	103	101	542	75	22	68	38	353	125	240
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	21	0	13	21	0	11	21	0	20	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	75	75	75	75	75	75	75	75	75	75	75	75
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	31	31	6	36	36	3	6	6	16	20	20
g / C, Green / Cycle	0.02	0.41	0.41	0.08	0.47	0.47	0.04	0.08	0.08	0.21	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.00	0.10	0.11	0.06	0.17	0.17	0.01	0.03	0.03	0.20	0.07	0.15
s, saturation flow rate [veh/h]	1781	1870	1702	1781	1870	1792	1781	1870	1657	1781	1870	1589
c, Capacity [veh/h]	29	760	691	150	886	849	66	157	139	380	487	414
d1, Uniform Delay [s]	36.64	14.84	14.90	33.53	12.55	12.55	35.42	32.58	32.67	29.09	22.09	24.28
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	4.94	0.82	0.94	5.18	1.11	1.17	2.96	1.29	1.67	10.09	0.27	1.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.27	0.26	0.27	0.67	0.36	0.36	0.34	0.34	0.38	0.93	0.26	0.58
d, Delay for Lane Group [s/veh]	41.59	15.66	15.84	38.71	13.66	13.72	38.38	33.86	34.34	39.18	22.36	25.56
Lane Group LOS	D	B	B	D	B	B	D	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.17	2.05	1.95	1.86	2.99	2.89	0.42	0.92	0.90	6.73	1.63	3.50
50th-Percentile Queue Length [ft/ln]	4.37	51.16	48.75	46.51	74.75	72.15	10.58	22.99	22.59	168.26	40.67	87.55
95th-Percentile Queue Length [veh/ln]	0.31	3.68	3.51	3.35	5.38	5.20	0.76	1.66	1.63	10.99	2.93	6.30
95th-Percentile Queue Length [ft/ln]	7.87	92.09	87.75	83.72	134.54	129.88	19.05	41.38	40.67	274.63	73.20	157.59

Movement, Approach, & Intersection Results

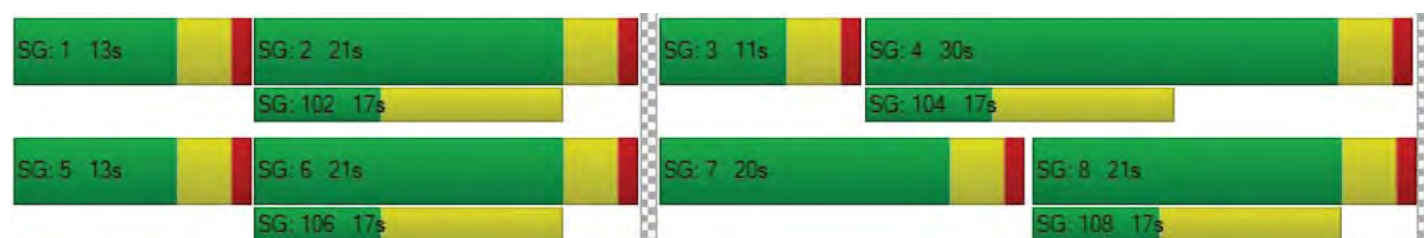
d_M, Delay for Movement [s/veh]	41.59	15.72	15.84	38.71	13.68	13.72	38.38	33.96	34.34	39.18	22.36	25.56
Movement LOS	D	B	B	D	B	B	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	16.28			17.21			34.83			31.70		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	23.51											
Intersection LOS	C											
Intersection V/C	0.512											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	27.31			27.31			27.31			27.31		
I_p,int, Pedestrian LOS Score for Intersection	2.719			2.698			2.388			2.579		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	453			453			453			693		
d_b, Bicycle Delay [s]	22.43			22.43			22.43			16.01		
I_b,int, Bicycle LOS Score for Intersection	1.879			2.152			1.665			2.152		
Bicycle LOS	A			B			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	67.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.855

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	34	0	19	0	0	0	0	159	1	29	278	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	201	7	104	86	46	0	0	39	77
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	20	201	7	104	86	211	1	30	328	77
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	2	5	54	2	28	23	57	0	8	89	21
Total Analysis Volume [veh/h]	38	8	22	218	8	113	93	229	1	33	355	83
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.03	0.02	0.85	0.03	0.14	0.08	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	21.15	22.56	11.56	67.05	20.24	10.69	8.51	0.00	0.00	7.76	0.00	0.00
Movement LOS	C	C	B	F	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.73	0.73	0.73	7.02	0.63	0.63	0.27	0.00	0.00	0.08	0.00	0.00
95th-Percentile Queue Length [ft/ln]	18.35	18.35	18.35	175.46	15.81	15.81	6.79	0.00	0.00	1.90	0.00	0.00
d_A, Approach Delay [s/veh]	18.21			47.16			2.45			0.54		
Approach LOS	C			E			A			A		
d_I, Intersection Delay [s/veh]	15.21											
Intersection LOS	F											

Intersection Level Of Service Report**Intersection 8: Project East Dwy (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration					T	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	185	283	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	88	0	0	247	116	194
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	0	0	439	410	194
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	0	116	108	51
Total Analysis Volume [veh/h]	88	0	0	462	432	204
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS				A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\PME.vistro

Scenario 6 Existing Plus Ambient Growth Plus Project Plus
Cumulative PM Peak Hour

Report File: C:\...\PMEAPC.pdf

5/17/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Winchester Rd (NS) at Whisper Heights (EW)	Signalized	HCM 6th Edition	NB Left	0.887	31.9	C
2	Winchester Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	SB Left	0.864	30.3	C
3	Winchester Rd (NS) at Blue Spruce Ln (EW)	Two-way stop	HCM 6th Edition	WB Right	0.249	24.1	C
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	WB Thru	1.179	100.9	F
5	Winchester Rd (NS) at Benton Rd (EW)	Signalized	HCM 6th Edition	WB Right	0.883	43.9	D
6	Leon Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	WB Left	0.491	20.2	C
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	SB Left	0.708	53.0	F
8	Project East Dwy (NS) at Jean Nicholas Rd (EW)	Two-way stop	HCM 6th Edition	WB Thru	0.005	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report**Intersection 1: Winchester Rd (NS) at Whisper Heights (EW)**

Control Type:	Signalized	Delay (sec / veh):	31.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.887

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	TWO			TWO			TWO			TWO		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	435.00	100.00	100.00	150.00	100.00	100.00	175.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	20	1358	132	205	859	21	7	17	17	125	26	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	55	107	35	7	70	24	14	0	37	46	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	76	1519	172	220	963	46	21	18	55	176	27	380
Peak Hour Factor	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	382	43	55	242	12	5	5	14	44	7	96
Total Analysis Volume [veh/h]	76	1528	173	221	969	46	21	18	55	177	27	382
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	120	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	50	50	12	34	0	11	21	0	17	27	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	47	63	8	49	49	3	17	17	12	26	26
g / C, Green / Cycle	0.06	0.47	0.63	0.08	0.49	0.49	0.03	0.17	0.17	0.12	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.04	0.43	0.11	0.06	0.27	0.03	0.01	0.01	0.03	0.10	0.01	0.24
s, saturation flow rate [veh/h]	1781	3560	1589	3459	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	110	1684	1003	277	1749	781	56	316	269	210	479	407
d1, Uniform Delay [s]	46.00	24.35	7.64	45.22	17.79	13.34	47.51	34.88	35.78	43.20	28.10	36.46
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	7.51	8.69	0.37	5.24	1.27	0.14	4.19	0.07	0.37	8.74	0.05	10.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.69	0.91	0.17	0.80	0.55	0.06	0.38	0.06	0.20	0.84	0.06	0.94
d, Delay for Lane Group [s/veh]	53.51	33.04	8.02	50.46	19.06	13.48	51.71	34.96	36.16	51.93	28.15	47.07
Lane Group LOS	D	C	A	D	B	B	D	C	D	D	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.98	16.27	1.32	2.74	7.05	0.51	0.56	0.36	1.14	4.63	0.47	9.79
50th-Percentile Queue Length [ft/ln]	49.50	406.86	32.95	68.60	176.31	12.78	14.03	9.02	28.47	115.65	11.86	244.81
95th-Percentile Queue Length [veh/ln]	3.56	22.89	2.37	4.94	11.41	0.92	1.01	0.65	2.05	8.15	0.85	14.92
95th-Percentile Queue Length [ft/ln]	89.10	572.26	59.31	123.48	285.19	23.00	25.25	16.24	51.25	203.84	21.36	373.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.51	33.04	8.02	50.46	19.06	13.48	51.71	34.96	36.16	51.93	28.15	47.07
Movement LOS	D	C	A	D	B	B	D	C	D	D	C	D
d_A, Approach Delay [s/veh]	31.48			24.47			39.40			47.67		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	31.90											
Intersection LOS	C											
Intersection V/C	0.887											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	39.61			39.61			0.00			39.61		
I_p,int, Pedestrian LOS Score for Intersection	3.345			3.407			0.000			2.597		
Crosswalk LOS	C			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	920			600			340			460		
d_b, Bicycle Delay [s]	14.58			24.50			34.45			29.65		
I_b,int, Bicycle LOS Score for Intersection	3.026			2.579			1.715			2.527		
Bicycle LOS	C			B			A			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 2: Winchester Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

Delay (sec / veh): 30.3
Level Of Service: C
Volume to Capacity (v/c): 0.864

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	575.00	100.00	100.00	160.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	230	1422	25	6	928	66	88	9	74	11	4	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	160	98	12	12	91	109	115	4	152	40	15	43
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	399	1577	38	18	1056	178	207	13	229	51	19	46
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	102	404	10	5	271	46	53	3	59	13	5	12
Total Analysis Volume [veh/h]	409	1617	39	18	1083	183	212	13	235	52	19	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	37	0	15	26	0	17	27	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	51	51	3	31	31	13	15	15	5	8	8
g / C, Green / Cycle	0.24	0.57	0.57	0.03	0.35	0.35	0.14	0.17	0.17	0.06	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.23	0.45	0.02	0.01	0.30	0.12	0.12	0.01	0.15	0.03	0.01	0.03
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	1870	1589	1781	1870	1589
c, Capacity [veh/h]	435	2008	897	52	1242	554	248	321	273	103	168	143
d1, Uniform Delay [s]	33.42	15.70	8.79	42.94	27.49	21.61	37.91	31.15	36.30	41.26	37.74	38.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	10.12	3.56	0.09	3.90	8.60	1.59	8.12	0.05	7.82	3.84	0.29	1.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.94	0.81	0.04	0.35	0.87	0.33	0.85	0.04	0.86	0.51	0.11	0.33
d, Delay for Lane Group [s/veh]	43.54	19.26	8.88	46.84	36.08	23.20	46.03	31.20	44.12	45.10	38.03	39.82
Lane Group LOS	D	B	A	D	D	C	D	C	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	9.13	11.15	0.30	0.43	11.02	2.78	4.89	0.23	5.33	1.18	0.38	0.98
50th-Percentile Queue Length [ft/ln]	228.21	278.84	7.42	10.63	275.56	69.51	122.22	5.73	133.23	29.56	9.57	24.59
95th-Percentile Queue Length [veh/ln]	14.08	16.63	0.53	0.77	16.47	5.00	8.51	0.41	9.12	2.13	0.69	1.77
95th-Percentile Queue Length [ft/ln]	352.09	415.76	13.36	19.14	411.68	125.11	212.87	10.32	227.88	53.20	17.22	44.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.54	19.26	8.88	46.84	36.08	23.20	46.03	31.20	44.12	45.10	38.03	39.82
Movement LOS	D	B	A	D	D	C	D	C	D	D	D	D
d_A, Approach Delay [s/veh]	23.88			34.40			44.64			41.86		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.29											
Intersection LOS	C											
Intersection V/C	0.864											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	3.476	3.394	2.613	2.354
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	489	511	378
d_b, Bicycle Delay [s]	18.05	25.69	24.94	29.61
I_b,int, Bicycle LOS Score for Intersection	3.263	2.619	1.939	1.754
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 3: Winchester Rd (NS) at Blue Spruce Ln (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	24.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.249

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	11R			11R			R			R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1607	159	0	1019	11	0	0	44	0	0	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.00	1.04	1.04	1.00	1.00	1.04	1.00	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	189	12	0	221	2	0	0	30	0	0	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1860	177	0	1281	13	0	0	76	0	0	59
Peak Hour Factor	0.8900	0.9500	0.9500	0.8900	0.9500	0.9500	0.8900	0.8900	0.9500	0.8900	0.8900	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	489	47	0	337	3	0	0	20	0	0	16
Total Analysis Volume [veh/h]	0	1958	186	0	1348	14	0	0	80	0	0	62
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.20	0.00	0.00	0.25
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.34	0.00	0.00	24.14
Movement LOS		A	A		A	A			C			C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.95
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.57	0.00	0.00	23.84
d_A, Approach Delay [s/veh]	0.00			0.00			16.34			24.14		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	0.77											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	100.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.179

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	124	7	113	106	30	15	55	8	16	46	37
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	586	1574	93	184	883	209	281	453	623	65	439	45
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	150	403	24	47	226	53	72	116	159	17	112	12
Total Analysis Volume [veh/h]	600	1611	95	188	904	214	288	464	638	67	449	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	38	53	0	15	30	0	21	41	41	11	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	34	49	49	11	26	26	17	38	76	6	27
g / C, Green / Cycle	0.28	0.41	0.41	0.09	0.22	0.22	0.14	0.31	0.63	0.05	0.22
(v / s)_i Volume / Saturation Flow Rate	0.34	0.46	0.47	0.11	0.25	0.13	0.16	0.25	0.40	0.04	0.27
s, saturation flow rate [veh/h]	1781	1870	1834	1781	3560	1589	1781	1870	1589	1781	1840
c, Capacity [veh/h]	505	766	751	163	777	347	252	586	1001	93	411
d1, Uniform Delay [s]	43.00	35.42	35.42	54.50	46.92	42.39	51.50	37.65	13.74	56.02	46.59
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	89.69	68.21	76.75	82.98	87.69	8.00	74.29	2.47	0.68	10.06	96.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.19	1.11	1.14	1.15	1.16	0.62	1.14	0.79	0.64	0.72	1.20
d, Delay for Lane Group [s/veh]	132.69	103.63	112.17	137.48	134.61	50.39	125.79	40.12	14.42	66.08	143.44
Lane Group LOS	F	F	F	F	F	D	F	D	B	E	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	26.56	34.87	35.98	8.48	20.42	6.23	12.57	12.32	9.52	2.21	22.88
50th-Percentile Queue Length [ft/ln]	664.01	871.78	899.52	212.10	510.41	155.69	314.25	307.94	237.93	55.28	571.88
95th-Percentile Queue Length [veh/ln]	38.74	48.11	50.10	13.94	30.16	10.32	19.48	18.07	14.58	3.98	33.87
95th-Percentile Queue Length [ft/ln]	968.49	1202.77	1252.61	348.54	753.97	258.01	487.05	451.83	364.41	99.50	846.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	132.69	107.65	112.17	137.48	134.61	50.39	125.79	40.12	14.42	66.08	143.44	143.44
Movement LOS	F	F	F	F	F	D	F	D	B	E	F	F
d_A, Approach Delay [s/veh]	114.35			121.22			46.08			134.22		
Approach LOS	F			F			D			F		
d_I, Intersection Delay [s/veh]	100.91											
Intersection LOS	F											
Intersection V/C	1.179											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	3.713	3.435	3.115	0.000
Crosswalk LOS	D	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	817	433	617	450
d_b, Bicycle Delay [s]	21.00	36.82	28.70	36.04
I_b,int, Bicycle LOS Score for Intersection	3.462	2.637	3.853	2.487
Bicycle LOS	C	B	D	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Winchester Rd (NS) at Benton Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	43.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.883

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	300.00	100.00	100.00	100.00	100.00	100.00	225.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	1474	348	389	1008	0	0	0	0	289	0	702
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.04	1.00	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	125	41	37	93	0	0	0	0	31	0	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1658	403	442	1141	0	0	0	0	332	0	758
Peak Hour Factor	1.0000	0.9630	0.9630	0.9630	0.9630	1.0000	1.0000	1.0000	1.0000	0.9630	1.0000	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	430	105	115	296	0	0	0	0	86	0	197
Total Analysis Volume [veh/h]	0	1722	418	459	1185	0	0	0	0	345	0	787
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Permiss	Overlap
Signal group	0	2	0	1	6	0	0	0	0	7	0	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	7	0	7	7	0	0	0	0	7	0	7
Maximum Green [s]	0	120	0	120	120	0	0	0	0	120	0	120
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Split [s]	0	61	0	37	98	0	0	0	0	22	0	22
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	10	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
Minimum Recall		No		No	No					No		No
Maximum Recall		No		No	No					No		No
Pedestrian Recall		No		No	No					No		No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C		L	R
C, Cycle Length [s]	120	120	120	120		120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	0.00
g_i, Effective Green Time [s]	57	57	33	94		18	55
g / C, Green / Cycle	0.48	0.48	0.27	0.78		0.15	0.46
(v / s)_i Volume / Saturation Flow Rate	0.48	0.26	0.26	0.33		0.10	0.50
s, saturation flow rate [veh/h]	3560	1589	1781	3560		3459	1589
c, Capacity [veh/h]	1696	757	487	2788		521	727
d1, Uniform Delay [s]	31.48	22.37	42.78	4.25		48.19	32.64
k, delay calibration	0.50	0.50	0.11	0.50		0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	25.71	2.89	9.62	0.48		1.45	43.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	1.02	0.55	0.94	0.43		0.66	1.08
d, Delay for Lane Group [s/veh]	57.19	25.25	52.40	4.72		49.65	76.11
Lane Group LOS	F	C	D	A		D	F
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	29.65	8.87	14.52	4.05		4.99	29.18
50th-Percentile Queue Length [ft/ln]	741.34	221.75	363.01	101.23		124.64	729.56
95th-Percentile Queue Length [veh/ln]	39.05	13.75	20.77	7.29		8.65	40.38
95th-Percentile Queue Length [ft/ln]	976.37	343.86	519.24	182.22		216.18	1009.42

Movement, Approach, & Intersection Results

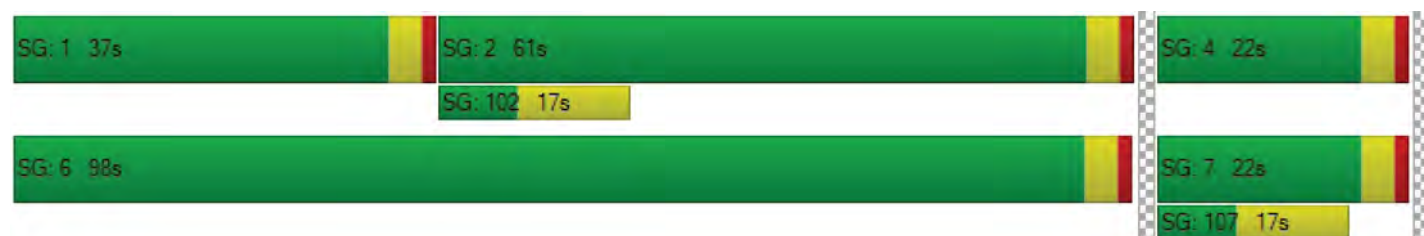
d_M, Delay for Movement [s/veh]	0.00	57.19	25.25	52.40	4.72	0.00	0.00	0.00	0.00	49.65	0.00	76.11
Movement LOS		F	C	D	A					D		F
d_A, Approach Delay [s/veh]	50.95			18.03			0.00			68.04		
Approach LOS	D			B			A			E		
d_I, Intersection Delay [s/veh]	43.88											
Intersection LOS	D											
Intersection V/C	0.883											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	0.00	0.00	49.50
I_p,int, Pedestrian LOS Score for Intersection	3.029	0.000	0.000	2.635
Crosswalk LOS	C	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	950	1567	0	0
d_b, Bicycle Delay [s]	16.54	2.82	60.00	60.00
I_b,int, Bicycle LOS Score for Intersection	3.325	2.916	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 6: Leon Rd (NS) at Jean Nicholas Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	20.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.491

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	250.00	100.00	100.00	250.00	100.00	100.00	240.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	50.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	33	177	167	70	149	4	5	30	40	86	52	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	145	53	26	85	28	48	37	0	40	27	35
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	329	227	99	240	32	53	68	42	129	81	103
Peak Hour Factor	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660	0.8660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	95	66	29	69	9	15	20	12	37	23	30
Total Analysis Volume [veh/h]	39	380	262	114	277	37	61	79	48	149	94	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	0	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	11	21	0	12	22	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	30	30	6	32	32	5	6	6	7	8	8
g / C, Green / Cycle	0.06	0.46	0.46	0.09	0.50	0.50	0.07	0.10	0.10	0.11	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.02	0.18	0.19	0.06	0.09	0.09	0.03	0.03	0.04	0.08	0.05	0.07
s, saturation flow rate [veh/h]	1781	1870	1620	1781	1870	1794	1781	1870	1645	1781	1870	1589
c, Capacity [veh/h]	100	851	737	170	924	887	131	182	160	191	245	208
d1, Uniform Delay [s]	29.70	11.85	11.88	28.52	9.12	9.13	28.98	27.52	27.61	28.37	25.93	26.62
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	2.46	1.41	1.66	4.57	0.41	0.43	2.56	1.18	1.53	6.82	0.99	2.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.39	0.40	0.41	0.67	0.17	0.17	0.47	0.36	0.39	0.78	0.38	0.57
d, Delay for Lane Group [s/veh]	32.16	13.27	13.55	33.08	9.53	9.56	31.54	28.70	29.13	35.19	26.92	29.09
Lane Group LOS	C	B	B	C	A	A	C	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.60	2.86	2.56	1.75	1.03	1.01	0.93	0.92	0.89	2.41	1.27	1.71
50th-Percentile Queue Length [ft/ln]	14.96	71.56	64.10	43.68	25.79	25.21	23.18	22.97	22.26	60.25	31.77	42.67
95th-Percentile Queue Length [veh/ln]	1.08	5.15	4.62	3.15	1.86	1.81	1.67	1.65	1.60	4.34	2.29	3.07
95th-Percentile Queue Length [ft/ln]	26.93	128.81	115.38	78.63	46.42	45.37	41.72	41.35	40.07	108.45	57.18	76.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.16	13.29	13.55	33.08	9.54	9.56	31.54	28.78	29.13	35.19	26.92	29.09
Movement LOS	C	B	B	C	A	A	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	14.47			15.81			29.77			31.04		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.17											
Intersection LOS	C											
Intersection V/C	0.491											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.657			2.603			2.387			2.521		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	523			523			523			554		
d_b, Bicycle Delay [s]	17.72			17.72			17.72			16.99		
I_b,int, Bicycle LOS Score for Intersection	2.121			1.913			1.715			1.858		
Bicycle LOS	B			A			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	53.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.708

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	9	0	10	0	0	0	0	194	13	47	238	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	143	5	69	87	69	0	0	76	74
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	5	10	143	5	69	87	271	14	49	324	74
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	3	39	1	19	24	75	4	13	89	20
Total Analysis Volume [veh/h]	10	6	11	157	6	76	96	298	15	54	357	81
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.03	0.01	0.71	0.03	0.10	0.09	0.00	0.00	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	22.09	24.18	10.29	53.02	23.07	10.38	8.52	0.00	0.00	8.02	0.00	0.00
Movement LOS	C	C	B	F	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.28	0.28	0.28	4.63	0.43	0.43	0.28	0.00	0.00	0.14	0.00	0.00
95th-Percentile Queue Length [ft/ln]	7.11	7.11	7.11	115.81	10.71	10.71	7.03	0.00	0.00	3.40	0.00	0.00
d_A, Approach Delay [s/veh]	17.75			38.71			2.00			0.88		
Approach LOS	C			E			A			A		
d_I, Intersection Delay [s/veh]	9.41											
Intersection LOS	F											

Intersection Level Of Service Report**Intersection 8: Project East Dwy (NS) at Jean Nicholas Rd (EW)**

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration					T	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	171	300	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	59	0	0	212	150	134
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	0	0	390	462	134
Peak Hour Factor	1.0000	0.9500	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	0	0	103	122	35
Total Analysis Volume [veh/h]	59	0	0	411	486	141
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS				A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Winchester at Jean Nicholas Commercial

Vistro File: C:\...\AME.vistro

Scenario 7 Existing Plus Ambient Growth Plus Project Plus
Cumulative AM Peak Hour - With Improvements

Report File: C:\...\AMEAPCI.pdf

5/19/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	EB Right	0.715	39.1	D
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	NB Left	0.326	14.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	39.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	367	650	62	54	1221	188	130	239	711	114	373	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	64	2	79	115	18	5	27	11	10	33	25
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	394	740	66	135	1385	214	140	276	750	129	421	34
Peak Hour Factor	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430	0.9430
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	104	196	17	36	367	57	37	73	199	34	112	9
Total Analysis Volume [veh/h]	418	785	70	143	1469	227	148	293	795	137	446	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	18	30	0	13	25	0	11	26	26	11	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	14	30	30	8	24	24	7	20	38	7	20	20
g / C, Green / Cycle	0.18	0.37	0.37	0.10	0.29	0.29	0.08	0.24	0.47	0.09	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.22	0.04	0.08	0.29	0.14	0.04	0.16	0.50	0.08	0.13	0.13
s, saturation flow rate [veh/h]	3459	3560	1589	1781	5094	1589	3459	1870	1589	1781	1870	1821
c, Capacity [veh/h]	606	1312	586	180	1498	468	294	455	744	157	460	449
d1, Uniform Delay [s]	31.03	20.52	16.74	35.24	28.08	23.31	35.08	27.24	21.32	36.14	26.20	26.21
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	1.41	2.02	0.42	7.75	19.03	3.58	1.34	1.53	37.38	13.88	0.95	0.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.69	0.60	0.12	0.80	0.98	0.49	0.50	0.64	1.07	0.87	0.53	0.53
d, Delay for Lane Group [s/veh]	32.44	22.55	17.15	42.99	47.11	26.89	36.42	28.77	58.70	50.02	27.14	27.19
Lane Group LOS	C	C	B	D	D	C	D	C	F	D	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.53	5.42	0.80	2.87	10.69	3.56	1.35	4.80	19.28	3.09	3.82	3.74
50th-Percentile Queue Length [ft/ln]	88.16	135.49	20.06	71.86	267.21	89.05	33.84	120.03	482.03	77.19	95.46	93.44
95th-Percentile Queue Length [veh/ln]	6.35	9.24	1.44	5.17	16.05	6.41	2.44	8.39	27.77	5.56	6.87	6.73
95th-Percentile Queue Length [ft/ln]	158.69	230.94	36.11	129.35	401.25	160.29	60.91	209.87	694.37	138.95	171.82	168.18

Movement, Approach, & Intersection Results

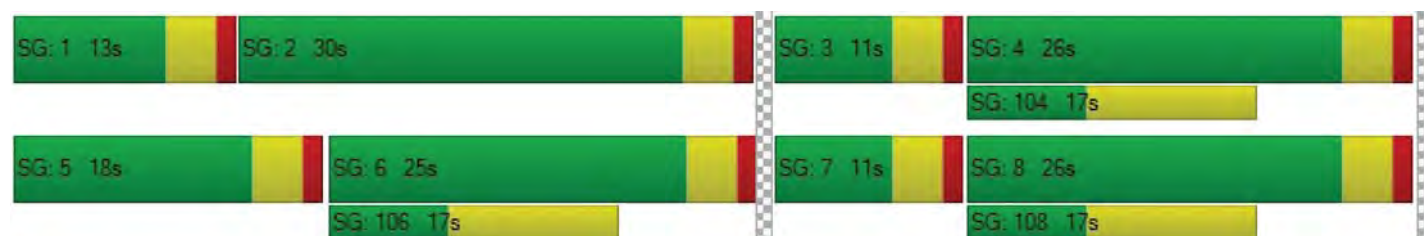
d_M, Delay for Movement [s/veh]	32.44	22.55	17.15	42.99	47.11	26.89	36.42	28.77	58.70	50.02	27.16	27.19
Movement LOS	C	C	B	D	D	C	D	C	F	D	C	C
d_A, Approach Delay [s/veh]	25.50			44.29			48.94			32.22		
Approach LOS	C			D			D			C		
d_I, Intersection Delay [s/veh]	39.13											
Intersection LOS	D											
Intersection V/C	0.715											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	0.00
I_p,int, Pedestrian LOS Score for Intersection	3.540	3.304	3.013	0.000
Crosswalk LOS	D	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	650	525	550	550
d_b, Bicycle Delay [s]	18.23	21.76	21.03	21.03
I_b,int, Bicycle LOS Score for Intersection	2.610	2.571	3.599	2.070
Bicycle LOS	B	B	D	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Signalized	Delay (sec / veh):	14.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.326

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+ +			+ +			+ +		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name												
Base Volume Input [veh/h]	34	0	19	0	0	0	0	159	1	29	278	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	201	7	104	86	46	0	0	39	77
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	20	201	7	104	86	211	1	30	328	77
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	2	5	54	2	28	23	57	0	8	89	21
Total Analysis Volume [veh/h]	38	8	22	218	8	113	93	229	1	33	355	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	120	0	0	120	0	0	120	0	0	120	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	28	0	0	11	0	0	21	0	0	21	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	9	9	35	35	35	35	35	35
g / C, Green / Cycle	0.08	0.14	0.14	0.58	0.58	0.58	0.58	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.04	0.10	0.10	0.10	0.06	0.06	0.03	0.12	0.12
s, saturation flow rate [veh/h]	1723	1781	1648	951	1870	1867	1150	1870	1750
c, Capacity [veh/h]	142	254	235	579	1078	1076	715	1078	1009
d1, Uniform Delay [s]	26.44	24.59	24.61	8.90	5.77	5.77	7.23	6.15	6.17
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.51	3.35	3.69	0.59	0.20	0.20	0.12	0.44	0.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.69	0.70	0.16	0.11	0.11	0.05	0.21	0.21
d, Delay for Lane Group [s/veh]	28.95	27.95	28.31	9.49	5.97	5.97	7.35	6.59	6.64
Lane Group LOS	C	C	C	A	A	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.98	2.47	2.32	0.61	0.49	0.49	0.18	1.02	0.98
50th-Percentile Queue Length [ft/ln]	24.55	61.70	58.02	15.35	12.16	12.16	4.40	25.48	24.54
95th-Percentile Queue Length [veh/ln]	1.77	4.44	4.18	1.10	0.88	0.88	0.32	1.83	1.77
95th-Percentile Queue Length [ft/ln]	44.19	111.07	104.43	27.62	21.90	21.88	7.92	45.86	44.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.95	28.95	28.95	28.02	28.31	28.31	9.49	5.97	5.97	7.35	6.61	6.64
Movement LOS	C	C	C	C	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	28.95			28.12			6.98			6.67		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	14.07											
Intersection LOS	B											
Intersection V/C	0.326											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	20.01			20.01			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	1.793			2.220			0.000			0.000		
Crosswalk LOS	A			B			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			233			567			567		
d_b, Bicycle Delay [s]	10.80			23.41			15.41			15.41		
I_b,int, Bicycle LOS Score for Intersection	1.672			2.119			1.826			1.948		
Bicycle LOS	A			B			A			A		

Sequence

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Winchester at Jean Nicholas Commercial

Vistro File: C:\...\PME.vistro

Scenario 7 Existing Plus Ambient Growth Plus Project Plus
Cumulative PM Peak Hour - With Improvements

Report File: C:\...\PMEAPCI.pdf

5/19/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Winchester Rd (NS) at Max Gillis Blvd (EW)	Signalized	HCM 6th Edition	WB Left	1.010	46.7	D
7	Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)	Signalized	HCM 6th Edition	NB Right	0.260	10.4	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Winchester Rd (NS) at Max Gillis Blvd (EW)

Control Type:	Signalized	Delay (sec / veh):	46.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.010

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	430.00	100.00	100.00	625.00	100.00	100.00	200.00	100.00	100.00	145.00	100.00	100.00
Speed [mph]	55.00			55.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	542	1394	83	68	747	172	256	383	591	47	378	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	124	7	113	106	30	15	55	8	16	46	37
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	586	1574	93	184	883	209	281	453	623	65	439	45
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	150	403	24	47	226	53	72	116	159	17	112	12
Total Analysis Volume [veh/h]	600	1611	95	188	904	214	288	464	638	67	449	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	8	7	4	0
Auxiliary Signal Groups									5,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	7	7	7	0
Maximum Green [s]	120	120	0	120	120	0	120	120	120	120	120	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	31	58	0	18	45	0	23	32	32	12	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	10	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No	No	No	No	
Maximum Recall	No	No		No	No		No	No	No	No	No	
Pedestrian Recall	No	No		No	No		No	No	No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	54	54	14	41	41	12	30	61	6	24	24
g / C, Green / Cycle	0.22	0.45	0.45	0.12	0.34	0.34	0.10	0.25	0.51	0.05	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.17	0.45	0.06	0.11	0.18	0.13	0.08	0.25	0.40	0.04	0.13	0.13
s, saturation flow rate [veh/h]	3459	3560	1589	1781	5094	1589	3459	1870	1589	1781	1870	1810
c, Capacity [veh/h]	778	1606	717	208	1746	545	354	461	803	93	368	356
d1, Uniform Delay [s]	43.61	32.94	19.23	52.35	31.51	29.95	52.76	45.20	24.56	56.02	44.73	44.77
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	1.66	23.19	0.38	13.50	1.10	2.12	4.57	20.84	1.84	10.03	2.24	2.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.77	1.00	0.13	0.90	0.52	0.39	0.81	1.01	0.79	0.72	0.68	0.69
d, Delay for Lane Group [s/veh]	45.27	56.14	19.61	65.85	32.61	32.07	57.33	66.04	26.40	66.05	46.97	47.12
Lane Group LOS	D	F	B	E	C	C	E	F	C	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.10	26.09	1.52	6.12	6.74	4.75	4.37	15.86	14.18	2.21	6.95	6.78
50th-Percentile Queue Length [ft/ln]	202.44	652.16	38.02	153.09	168.44	118.72	109.14	396.43	354.42	55.26	173.71	169.49
95th-Percentile Queue Length [veh/ln]	12.76	34.55	2.74	10.18	10.99	8.32	7.79	22.46	20.35	3.98	11.27	11.05
95th-Percentile Queue Length [ft/ln]	319.11	863.64	68.43	254.54	274.86	208.06	194.81	561.59	508.79	99.47	281.79	276.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.27	56.14	19.61	65.85	32.61	32.07	57.33	66.04	26.40	66.05	47.03	47.12
Movement LOS	D	F	B	E	C	C	E	F	C	E	D	D
d_A, Approach Delay [s/veh]	51.80			37.31			46.04			49.31		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	46.71											
Intersection LOS	D											
Intersection V/C	1.010											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			0.00		
I_p,int, Pedestrian LOS Score for Intersection	3.614			3.438			3.113			0.000		
Crosswalk LOS	D			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	900			683			467			283		
d_b, Bicycle Delay [s]	18.15			26.00			35.27			44.20		
I_b,int, Bicycle LOS Score for Intersection	3.462			2.278			3.853			2.023		
Bicycle LOS	C			B			D			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 7: Mauna Loa Rd (NS) at Jean Nicholas Rd (EW)**

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.260

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+ +			+ +			+ +		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			No		

Volumes

Name												
Base Volume Input [veh/h]	9	0	10	0	0	0	0	194	13	47	238	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	143	5	69	87	69	0	0	76	74
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	5	10	143	5	69	87	271	14	49	324	74
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	3	39	1	19	24	75	4	13	89	20
Total Analysis Volume [veh/h]	10	6	11	157	6	76	96	298	15	54	357	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	120	0	0	120	0	0	120	0	0	120	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	12	0	0	15	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	7	7	39	39	39	39	39	39
g / C, Green / Cycle	0.04	0.11	0.11	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.02	0.07	0.07	0.10	0.08	0.08	0.05	0.12	0.12
s, saturation flow rate [veh/h]	1715	1781	1655	951	1870	1839	1066	1870	1753
c, Capacity [veh/h]	78	204	189	654	1199	1179	738	1199	1124
d1, Uniform Delay [s]	27.92	25.40	25.43	6.42	4.24	4.24	5.59	4.41	4.42
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.64	2.85	3.20	0.47	0.23	0.23	0.19	0.35	0.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.60	0.61	0.15	0.13	0.13	0.07	0.19	0.19
d, Delay for Lane Group [s/veh]	30.56	28.25	28.64	6.89	4.46	4.47	5.79	4.75	4.79
Lane Group LOS	C	C	C	A	A	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.42	1.73	1.66	0.48	0.49	0.49	0.23	0.73	0.70
50th-Percentile Queue Length [ft/ln]	10.40	43.32	41.42	12.11	12.26	12.16	5.87	18.27	17.61
95th-Percentile Queue Length [veh/ln]	0.75	3.12	2.98	0.87	0.88	0.88	0.42	1.32	1.27
95th-Percentile Queue Length [ft/ln]	18.72	77.98	74.56	21.80	22.07	21.89	10.57	32.88	31.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.56	30.56	30.56	28.34	28.64	28.64	6.89	4.47	4.47	5.79	4.77	4.79
Movement LOS	C	C	C	C	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	30.56			28.44			5.04			4.89		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	10.36											
Intersection LOS	B											
Intersection V/C	0.260											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	1.819	2.191	0.000	0.000
Crosswalk LOS	A	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	367	967	967
d_b, Bicycle Delay [s]	22.53	20.01	8.01	8.01
I_b,int, Bicycle LOS Score for Intersection	1.604	1.954	1.897	1.966
Bicycle LOS	A	A	A	A

Sequence

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX E

TRAFFIC SIGNAL WARRANT WORKSHEET

PEAK HOUR VOLUME WARRANT (Rural Areas)

Existing Plus Ambient Plus Project Plus Cumulative

Major Street Name = **Jean Nicholas Rd**

Total of Both Approaches (VPH) = **819**

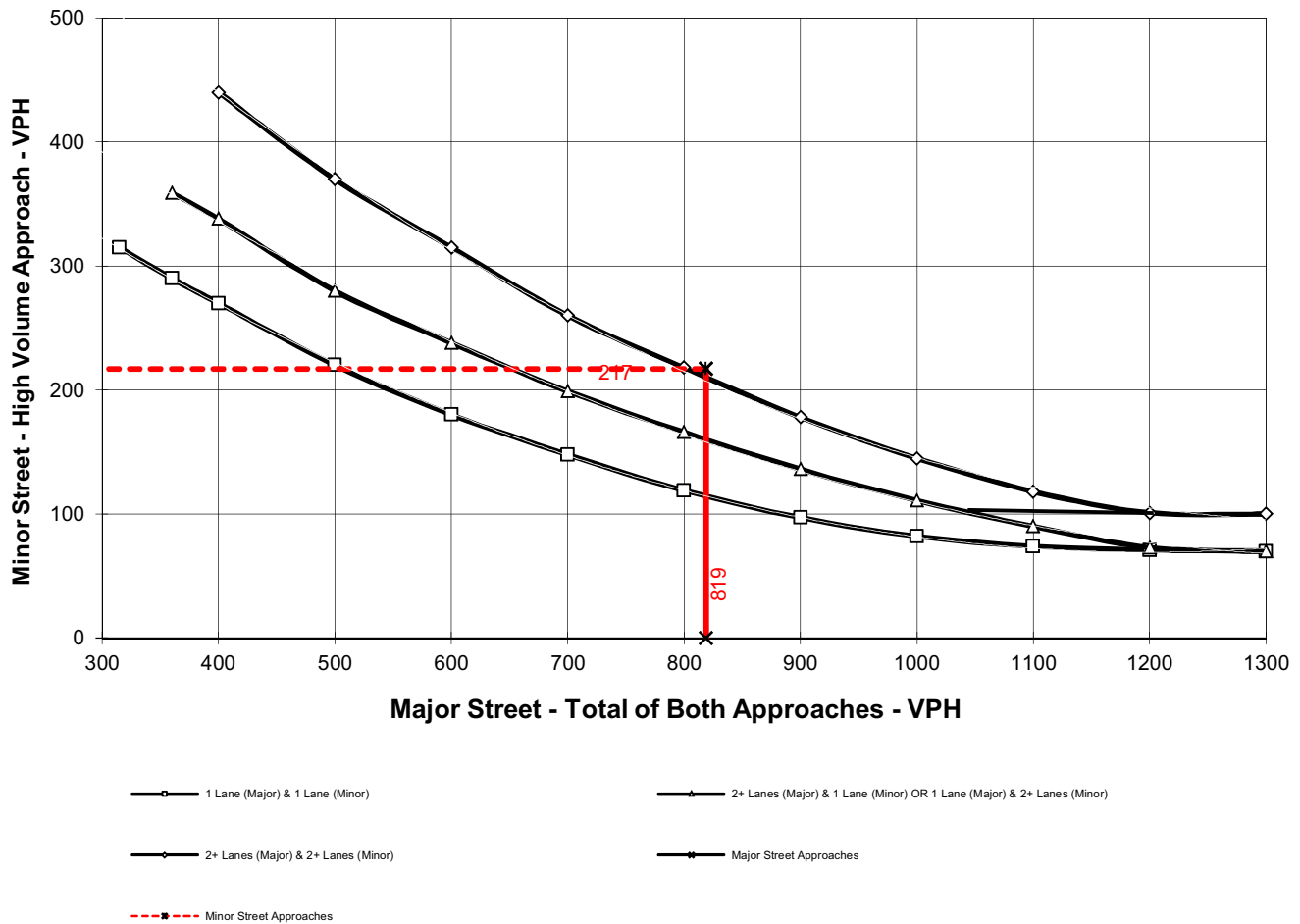
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Mauna Loa Rd/Project Driveway**

High Volume Approach (VPH) = **217**

Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



**** NOTE:**

100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



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