Appendix I Traffic Operations Analysis Report

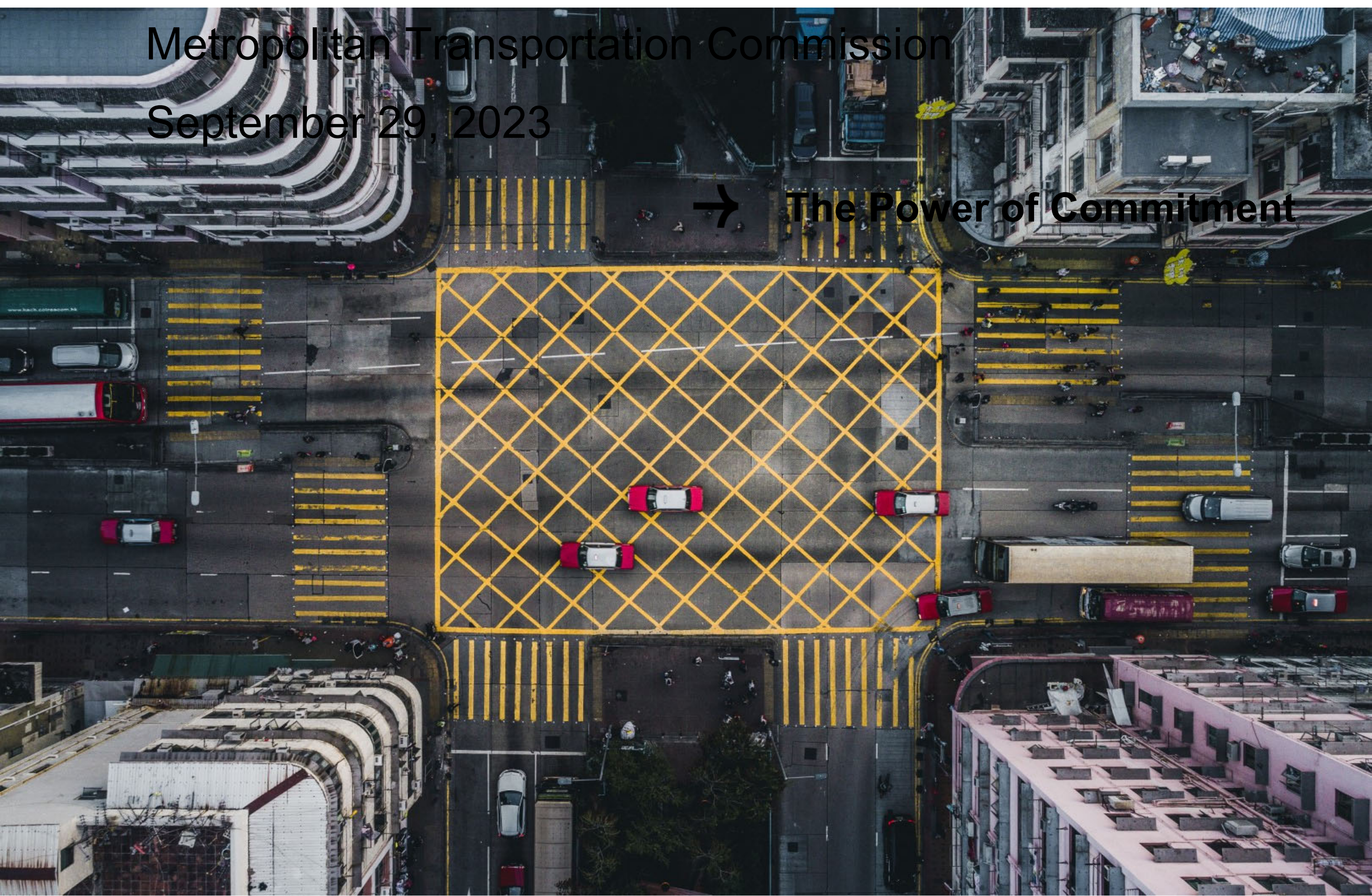
Traffic Operations Analysis Report/Intersection Control Evaluation

NAPA FORWARD – STATE ROUTE 29 (ROUTE-29) IMPROVEMENTS AT RUTHERFORD AND OAKVILLE INTERSECTIONS PROJECT
EA 04-2W430

Metropolitan Transportation Commission

September 29, 2023

→ **The Power of Commitment**



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1. Introduction

This Traffic Operations Analysis Report (TOAR) and the Intersection Control Evaluation (ICE) were prepared in support of the Project Study Report-Project Report (PSR-PR) for a project that proposes improvements to two intersections along State Route (Route) 29 in Napa County – Route 29/Rutherford Road and Route 29/Oakville Cross Road. Metropolitan Transportation Commission (MTC), in cooperation with Napa Valley Transportation Authority (NVTA) and the California Department of Transportation (Caltrans), proposes to improve the operation and safety of Route 29 at the intersections of Oakville Cross Road (PM 22.72) and Rutherford Road (PM 24.59) within unincorporated Napa County. The proposed project would replace each of the existing two-way-stop-controlled (TWSC) intersections with either a roundabout or traffic signal.

Currently, both intersections are side-street-stop controlled, with a two-way-left-turn-lane along Route 29. Route 29 is one of the two major north-south corridors that provides connectivity through the cities of Calistoga, St. Helena, Yountville, Napa and American Canyon within Napa County. It is a primary freight, agricultural, and commute corridor with access to the San Francisco Bay Area and Sacramento as well as nearby Solano and Lake Counties. As the gateway to the Napa Valley Wine Country, Route 29 is a main route that brings tens of thousands of tourists to the region each year.

The section of the Route 29 corridor associated with the study intersections regularly experiences heavy traffic congestion during peak periods, resulting in delay and queueing issues at the side street approaches of Rutherford Road and Oakville Cross Road. Within the project limits, Route 29 between Whitehall Lane and Oakville Cross Road experiences heavy congestion during peak periods. The existing Route 29 corridor is uncontrolled within the project study area. Traffic on Route 29 is not required to stop, creating a continuous traffic flow and leaving no gaps for drivers on side streets to make turns. Therefore, vehicles at many of the side-street stop-controlled intersection approaches along the corridor have trouble turning onto Route 29. In response to the deficient traffic operations and safety concerns, the proposed projects (Build Alternatives) have been identified to improve traffic operations and enhance safety at the intersections and will include the following:

- Replacement of the existing TWSC intersection with a roundabout or a traffic signal.
- Provision of pedestrian and bicycle facilities within the project vicinity and to local businesses and destinations.
- Design features to accommodate projected traffic growth through Year 2035 conditions (Design Year).

This report has been prepared by GHD to assess the potential alternative improvements at the following intersections:

- Route 29/Rutherford Road
- Route 29/Oakville Cross Road

As agreed with the Project Development Team (PDT) and Caltrans Highway Operations Team, this report examines the traffic operations for Existing Conditions as well as three alternatives in the Opening Year (2025), and Design Year (2035):

- No Build Alternative – Utilize existing lane geometrics and intersection controls at the two study intersections.
- Roundabout Alternative – Construct a four-legged, single lane roundabout at the existing intersections.
- Traffic Signal Alternative – Upgrade the study intersections from two-way stop-control to a traffic signal.

The methodology used in evaluating the potential improvements at the intersections listed above is in compliance with the Caltrans Traffic Operations Policy Directive (TOPD) 13-02, Intersection Control Evaluation (ICE), for intersection improvements on the State Highway system. The ICE study has been prepared to present the results of the different build alternatives including No Build. The ICE analysis builds upon the analysis presented in this TOAR, as well as analyses completed in previous studies, and compares safety and operations associated with the proposed improvement alternatives, consistent with the Caltrans TOPD 13-02. The term “project,” as used in this report, will refer to potential improvements at the two study intersections.

1.1 Study Area Roadways

Roadways that provide primary access to the two study intersections are Route 29, Rutherford Road, the private driveway at Inglenook Winery, Oakville Cross Road, and Walnut Lane. Figure 1.1 shows the study intersections and the surrounding area. The following brief descriptions present characteristics unique to the major roadways providing access to the study intersections.

1.1.1 Route 29

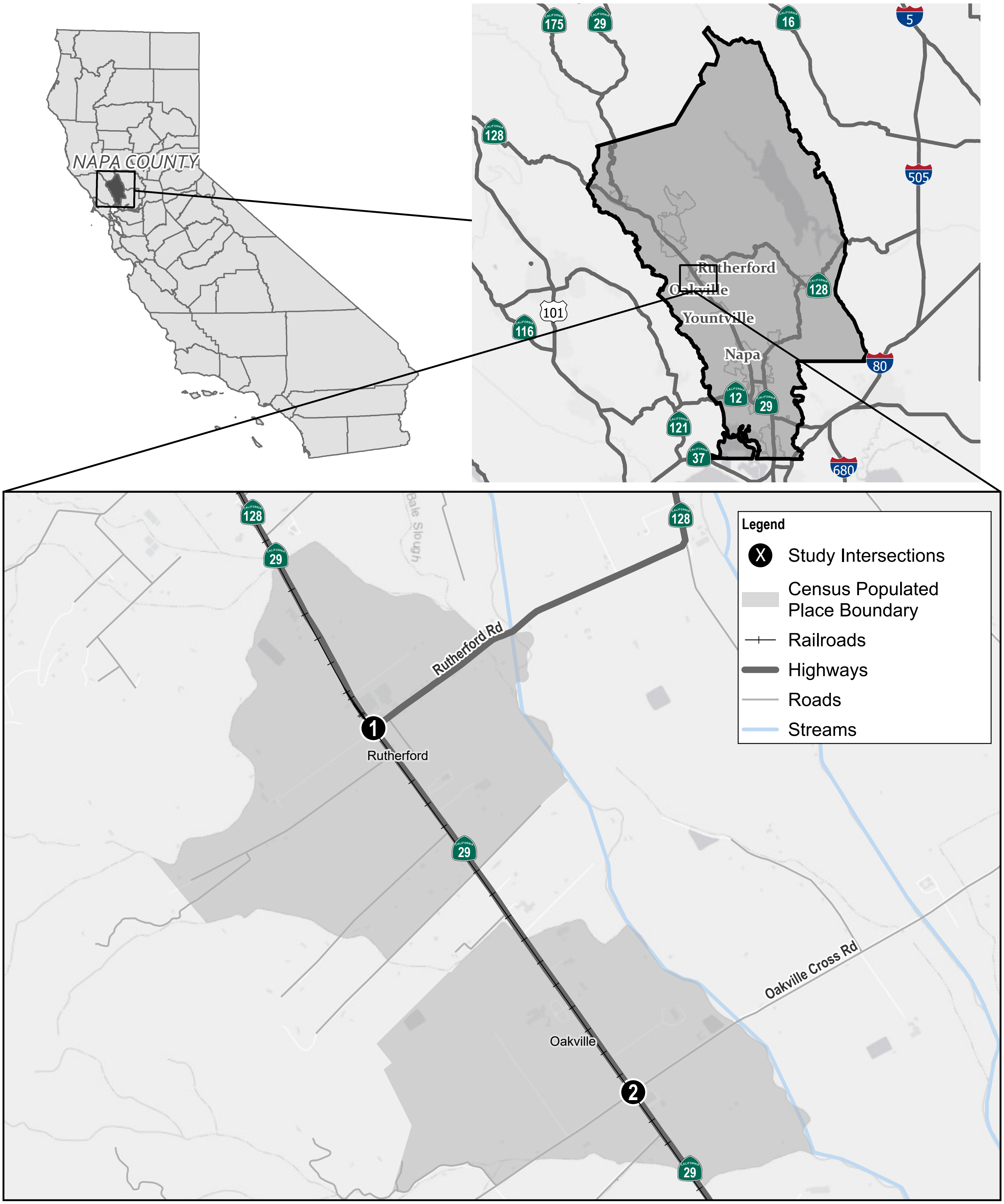
Route 29, in the project vicinity, is a two-lane, north-south conventional highway with discontinuous two-way-left-turn lanes (TWLTL) between the two study intersections. The highway serves residential, commercial, and agricultural land uses within Napa County. North of Rutherford Road, Route 29 and Route 128 are contiguous. The posted speed limit along Route 29 within the study area ranges from 50 miles per hour (mph) south of the Route 29/Oakville Cross Road intersection to 40 mph north of Rutherford Road.

1.1.2 Rutherford Road/Route 128

Rutherford Road, contiguous with Route 128, is a two-lane, east-west highway located in the community of Rutherford that serves residential and commercial land uses. It connects to one of two Route 29 study intersections to the west, forming the east leg of the study intersection, and becomes Conn Creek Road/continues as Route 128 to the east. The posted speed limit on Rutherford Road near the study intersection is 30 mph.

1.1.3 Oakville Cross Road

Oakville Cross Road is a two-lane, east-west collector roadway located in the community of Oakville that serves commercial and agricultural uses. It connects Route 29 in the west to Silverado Trail in the east. There is no posted speed limit on Oakville Cross Road other than a 25-mph zone near the bridge over the Napa River, about 0.5 miles to the east of Route 29. There are 30 mph advisory signs along the eastern segment of the roadway.



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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

Vicinity Map

Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

FIGURE 1-1

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Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, USGS, EPA, NPS; World Light Gray Canvas Base: Esri, HERE, Garmin, USGS, EPA, NPS; TIGER, 2021. Created by: pthornton

1.2 Need and Purpose

1.2.1 Need

The intersections under study have been experiencing poor traffic operation and a high number of collisions due to the lack of protected turning movements.

- The number of collisions exceed the state-wide average for similar facilities
- Poor intersection operation occurs during peak and non-peak periods caused by high traffic volume
- Lack of protected turning movements limit access to and from Route-29 due to insufficient gaps in traffic streaming

1.2.2 Purpose

The purpose of the project is to enhance safety and traffic operations at the intersections of Route 29/Oakville Cross Road and Route 29/Rutherford Road.

- Improve travel time and reduce delay for side streets accessing Route 29
- Enhance traffic safety.
- Improve turning movements.

1.3 Previous Studies

In January 2020, MTC completed a traffic operations analysis to identify the causes of and potential solutions to congestion in the greater project vicinity. The results indicated that enhanced intersection control at the two intersections would improve multimodal traffic operations performance along Route 29. Preliminary crash data analysis provided by Caltrans indicates that the total rate of fatal and injury crashes at these two intersections is above the average crash rate for similar facilities statewide. Based on the results of traffic and safety analyses and feedback received from project stakeholders, the implementation of a traffic signal and roundabout are viable options to address the operations and safety needs.

Federal Highway Administration (FHWA) studies indicate that a properly designed roundabout would slow down traffic, thereby reducing the probability of the most severe types of intersection crashes and injuries. Roundabouts also allow for continuous flow of traffic at lower speed through this segment of the corridor and would be the ideal candidate to address the safety and operations challenges associated with the corridor.

2. Analysis Policies and Methodologies

2.1 Level of Service Methodology

Traffic operations are quantified through the determination of "Level of Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection, representing progressively worsening traffic operations as determined by vehicle delay or congestion. LOS “A” represents free-flow operating conditions and LOS “F” represents over-capacity conditions. These LOS letters correspond to numerical ranges of delay that are included in Table 2.1. Levels of Service were calculated for all study intersection control types using the methods documented in the Transportation Research Board Publication Highway Capacity Manual, Sixth Edition (HCM 6).

For signalized intersections, intersection delays and LOS are average values for all intersection movements. For two-way stop controlled (TWSC) intersections, the intersection delays and LOS are represented by the worst approach. All signalized intersection operations analyses were conducted using procedures and methodologies contained in the Highway Capacity Manual (HCM 6th Edition For unsignalized/signalized control, the LOS was determined using Synchro/SimTraffic 10 (Version 10.3.154.0) simulation software by Trafficware. For roundabout control, the LOS was determined using Sidra 9 (Version 9.0.2.9732) software using sidra analysis methodology. The model that was used in the analysis is the Akcelik M3 roundabout analysis model.

2.2 Study Facilities and Time Periods

2.2.1 Study Periods

The Route 29 study intersection weekday AM and PM peak hours as well as weekend mid-day peak hour were analyzed in the traffic operations analysis report (TOAR). Additionally, queue analysis was performed using SimTraffic in the TOAR.

2.2.2 Analysis Scenarios

The study facilities listed above were analyzed for the following analysis periods in the TOAR:

- Existing
- Year 2025 (Assumed to be Opening Year)
- Year 2035 (Assumed to be Design Year)

2.3 Agency Guidelines and Policies

2.3.1 Level of Service

Napa County

The County of Napa General Plan contains the following policy pertaining to the LOS standards at intersections:

> *The County shall seek to maintain a Level of Service D or better at all signalized intersections, except where the level of service already exceeds this standard (i.e., Level of Service E or F) and where increased intersection capacity is not feasible without substantial right-of-way.*

Caltrans

Caltrans' Transportation Analysis Framework (TAF) and Transportation Analysis Under CEQA (TAC) state that intersection improvement projects are "not likely to lead to a measurable and substantial increase in VMT and which therefore generally should not require an induced travel analysis per OPR's Technical Advisory." For the purpose of this study, the intersections of Route 29/Rutherford Road (Route 128) and Route 29/Oakville Cross Road will be analyzed at a threshold of LOS D. Table 2.1 presents the Intersection Level of Service thresholds criteria.

Table 2.1: Level of Service Criteria for Intersections

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle	
				Signalized/Roundabout	Side-Street/All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0

2.4 Key Technical Parameters and Assumptions

The following assumptions informed the analysis of potential improvements to the project's two study intersections as part of the Napa Valley Forward (NVF) Route 29 Safety & Operational Intersection Improvements project:

- The Peak Hour Factor (PHF) was calculated based on the traffic counts conducted for this study for each analysis location.
- A peak hour truck percentage for Route 29 was estimated from the existing traffic counts conducted at the study intersections.
- A travel speed of 50 mph was used for Route 29 and speeds on the local roadways will be based on the current posted speed limit.

Table 2.2 presents the technical parameters assumed for the evaluation of the study intersections for the analysis scenarios. All parameters not listed should be assumed as default or calculated values based on HCM methodology. These parameters were used in the preparation of the TOAR.

Table 2.2: Technical Parameters and Assumptions

Technical Parameters	Assumptions
1. Intersection Peak Hour Factor (PHF)	Intersection overall, Based on Existing Counts, PHF of 1.0 used for opening and design year
2. Intersection Heavy Vehicle Percentage	Intersection overall, Based on Existing Counts, min. 2%
3. Signal Timing	Based on current Caltrans Signal Timing Plans

3. Existing Conditions

The existing conditions section presents the analysis scenarios in which current operations at study locations are analyzed and establishes the baseline traffic conditions.

Existing lane geometries and traffic control of the study intersections are presented in Figure 3.1. The figure also shows the length of right- and left-turn pocket storages, where present. The Rutherford Road and Oakville Cross Road intersections are both side-street stop-controlled.

To remain consistent with the calibrated SimTraffic model that was used in the Napa Route-29 and Silverado Trail Improvements Final Operations Analysis Memorandum (September 2019, Kimley-Horn), the following modifications were made to the Synchro/SimTraffic Model for the No Build scenarios:

- Headway @ 0 mph (sec) = Used 3 instead of default value of 0.65 to 0.35
- Headway @ 20 mph (sec) = Used 3 instead of default value of 1.80 to 0.80
- Headway @ 50 mph (sec) = Used 3 instead of default value of 2.20 to 1.00
- Headway @ 80 mph (sec) = Used 3 instead of default value of 2.20 to 1.00
- Gap Acceptance Factor = Used 0.75 instead of default value of 1.15 to 0.85
- Saturated flow on Route-29 adjusted to be 1,055 vphpl

Even with these changes to the model, SimTraffic lacks the capability to accurately model the traffic operations on this corridor as congestion occurs on the major roadway that is not the result of a stop-intersection control or reduction in roadway capacity. However, the adjustments will make the SimTraffic analysis closer to Existing Conditions and will allow for better comparison to the Build scenarios. These SimTraffic settings can also be found in Appendix L.

3.1 Traffic Volumes

Intersection turning movement counts were collected for the study intersections and daily traffic counts were collected for roadway segments on Route 29 between Rutherford Road and Oakville Cross Road. These counts were collected between May 5th, 2022, and May 8th, 2022. Counts at the study intersections were collected for the weekday AM peak period (6:00 AM to 9:00 AM), the weekday PM peak period (3:00 PM to 7:00 PM), and for the weekend mid-day peak period (11:00 AM to 3:00 PM). The total weekday daily traffic for the Route 29 segment between Oakville Cross Road and Rutherford Road was found to be 20,500, of which the NB traffic was 10,900 and the SB traffic was 9,600. The traffic counts are included in Appendix A.

3.1.1 Annual Average Daily Traffic

Caltrans publishes ADT data in a count book annually for all the facilities on the State Highway System. As noted in the count book, few locations are counted continuously, and the resulting counts are adjusted to derive an estimate of ADT.

More recent pre-pandemic data for 2019 was reviewed from the Caltrans count book in the project vicinity. The 2019 ADT data in the project vicinity (around PM 22.52 and 24.595) was found to be around 24,600 to 26,400.

Caltrans Highway Operations unit collected ADT counts in 2017 on the Route 29 segment north of the Oakville Cross Road in the northbound direction only. The actual data in 2017 was collected over a one-week period beginning April 12, 2017, thru April 19, 2017. The weekday average daily traffic over this period was found to be 10,900 (NB direction only). A comparison of 2017 Caltrans count in the NB direction and the 2022 May count indicates that the volume was almost identical and no growth in traffic was observed. Based on the data obtained in 2022, the combined NB and SB ADT can be estimated to 20,500.

For 2017, the ADT data from the count book in the project vicinity (around PM 22.52 and 24.595) was found to be around 26,000 to 28,000, which is higher than the 20,500 ADT based on the actual count data.

Due to the travel restrictions associated with the COVID-19 pandemic, pre-COVID-19 historic Caltrans traffic data was obtained to compare to the existing counts to ensure that existing volumes reflect typical conditions. The existing 2022 ADT counts were found to be higher than the 2017 pre-COVID-19 counts. As such, after discussion with Caltrans, no adjustments were made to the existing 2022 traffic data. Table 3.1 below presents the roadway volumes for Thursday, Friday, and the highest weekend ADT. Table 3.2 below presents the same 2022 Roadway Segment ADTs broken down into passenger vehicles and Truck Traffic.

Table 3.1: 2022 Roadway Segment Volume Summary

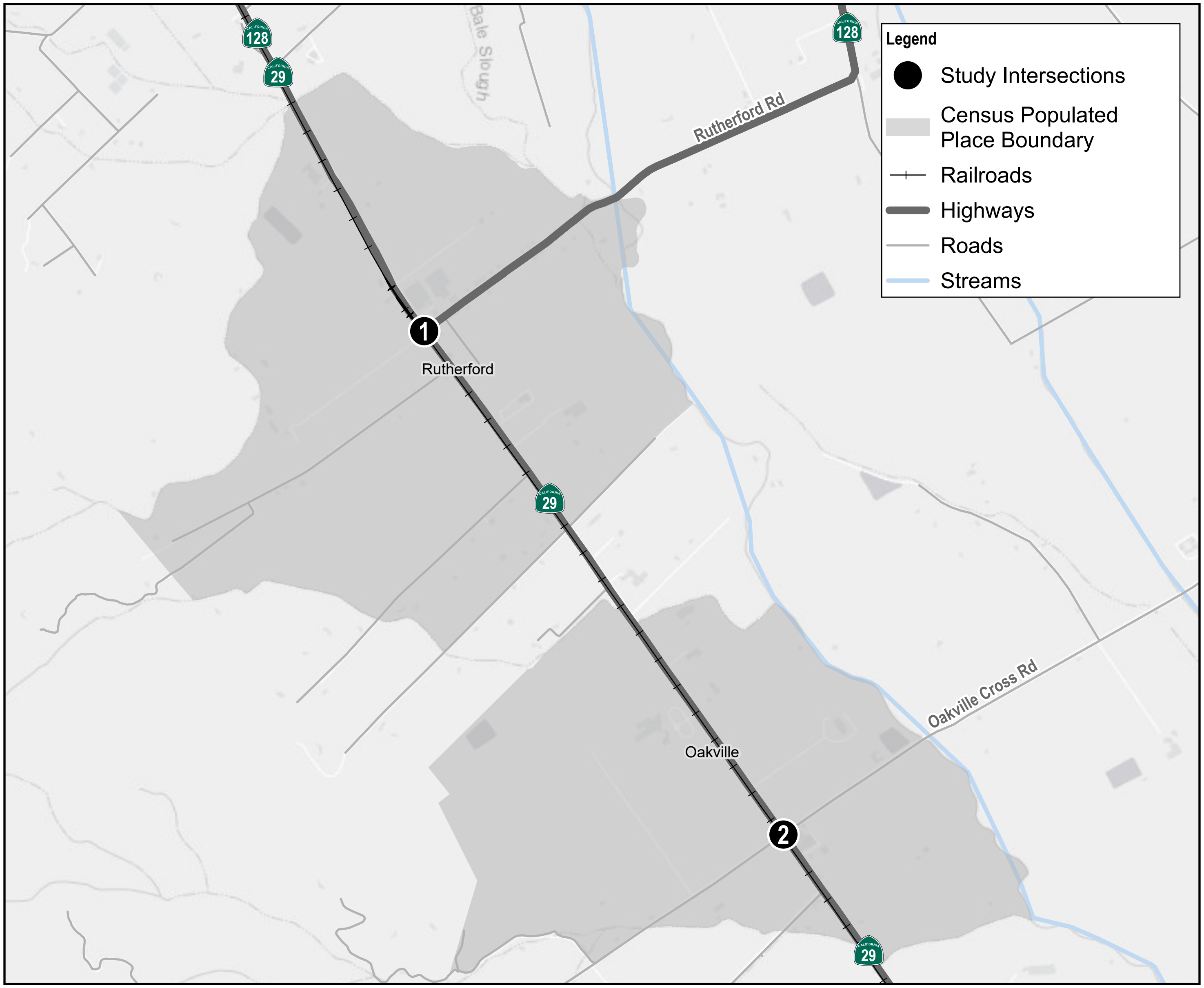
Roadway	Segment	Thursday			Friday			Weekend		
		All Traffic	All Vehicular Traffic	Bike Traffic	All Traffic	All Vehicular Traffic	Bike Traffic	All Traffic	All Vehicular Traffic	Bike Traffic
Route 29	Between Rutherford Road and Oakville Cross Road	20,532	20,392	140	21,474	21,336	138	20,195	20,082	113

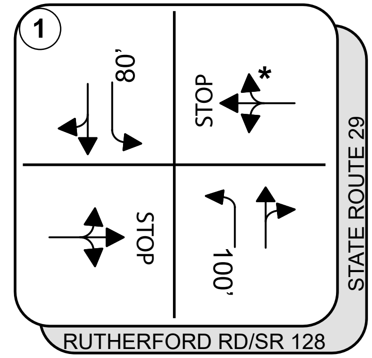
Table 3.2: 2022 Roadway Segment Truck Percent Summary

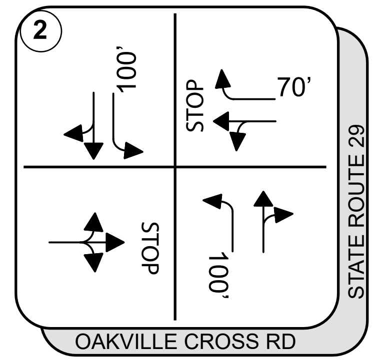
Roadway	Segment	Thursday				Friday				Weekend			
		Cars	Trucks	Total	Truck %	Cars	Trucks	Total	Truck %	Cars	Trucks	Total	Truck %
Route 29	Between Rutherford Road and Oakville Cross Road	18,949	2,387	21,336	11.2%	17,811	2,581	20,392	12.7%	18,759	1,323	20,082	6.6%

3.1.2 Existing (2022) Peak Hour Data

Figure 3.1 presents the existing lane geometrics and traffic control, Figure 3.2 presents the existing turning movement counts for the weekday AM and PM peak hour, and Figure 3.3 presents the existing turning movement counts for the weekend peak hour for each of the study intersections.







*Note: Existing lane geometry shows a shared right-turn for this movement, however it operates as an exclusive right-turn. Synchro model lane geometry reflects how the intersection operates.

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METROPOLITAN TRANSPORTATION COMMISSION (MTC)
NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

EXISTING LANE GEOMETRIES & TRAFFIC CONTROL

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Revision No. -
Date Feb 2023

FIGURE 3-1

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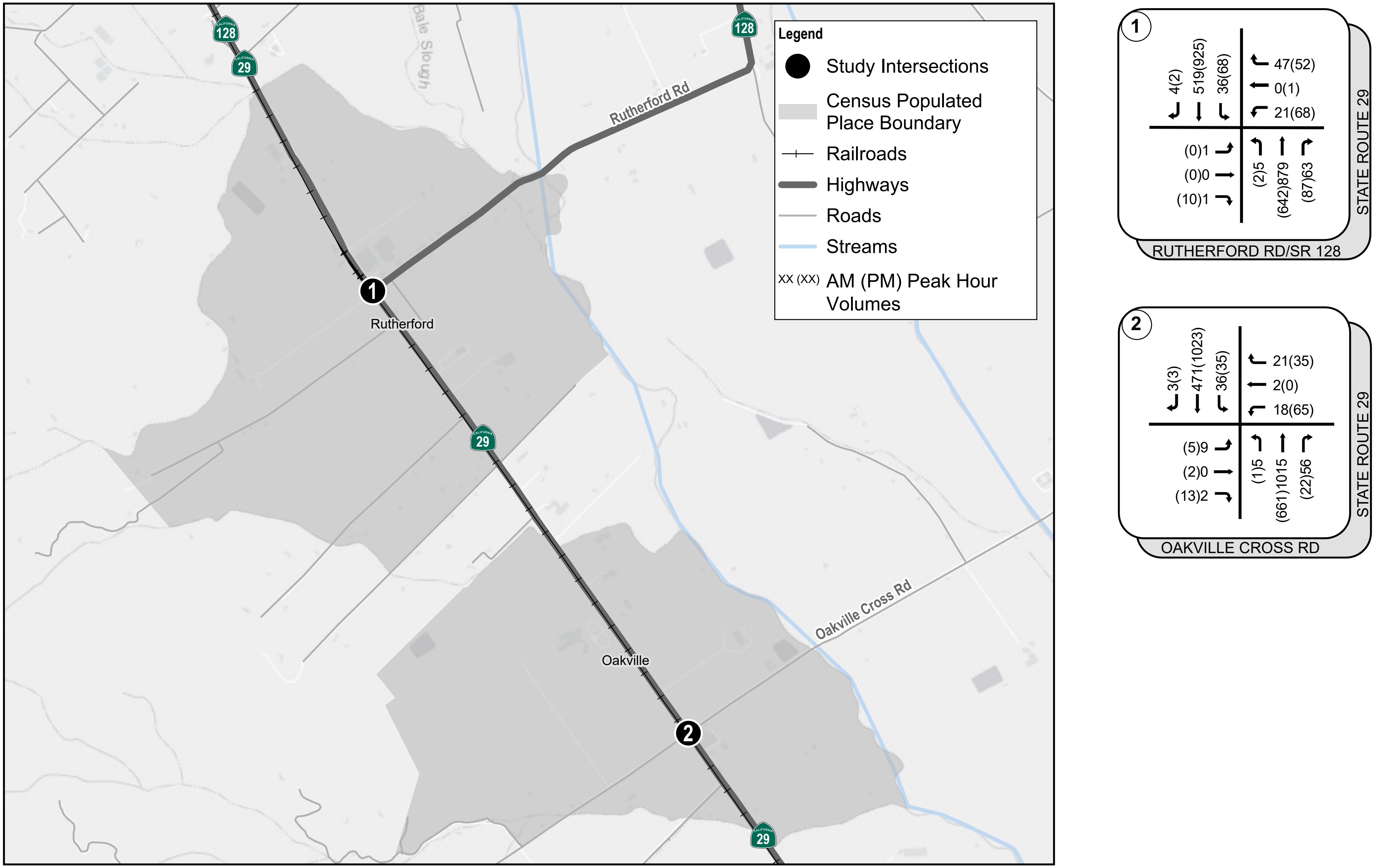

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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

EXISTING WEEKDAY PEAK HOUR TURNING MOVEMENT COUNTS

Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

FIGURE 3-2

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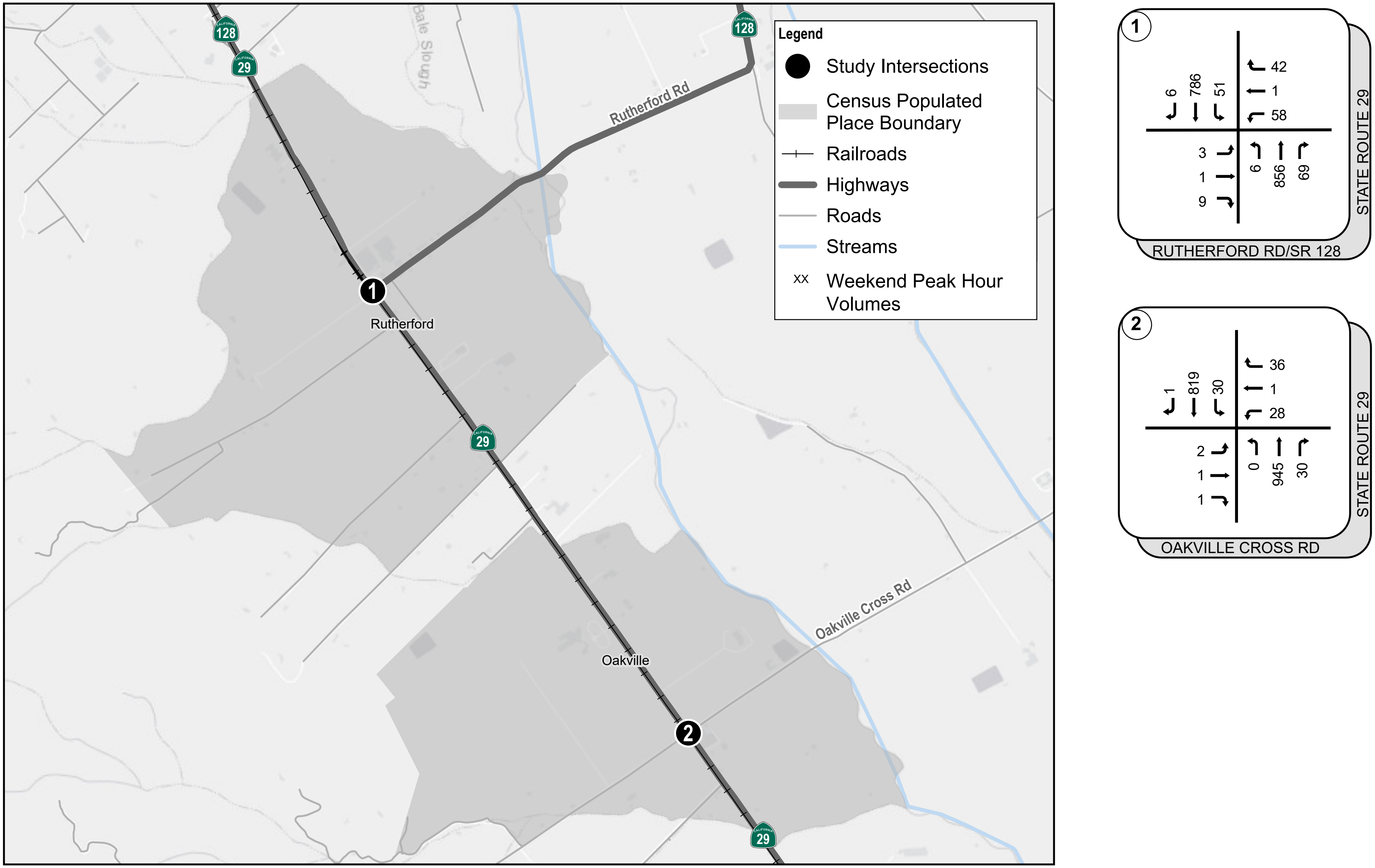

*Note: Existing lane geometry shows a shared right-turn for this movement, however it operates as an exclusive right-turn. Synchro model lane geometry reflects how the intersection operates.

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METROPOLITAN TRANSPORTATION COMMISSION (MTC)
NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

EXISTING WEEKEND PEAK HOUR TURNING MOVEMENT COUNTS

Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

FIGURE 3-3

\\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\08 - GIS\Maps\Deliverables\11227647_MTC SR 29 Intersections\11227647_MTC SR 29 Intersections.aprx - 11227647_Figure 3-1_TOAR_Existing Lane Geos
Print date: 23 Feb 2023 - 19:05

Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA; Roads, Highways: TIGER, 2021. Created by: pthornton

3.1.3 Heavy Vehicle Impact

The peak hour heavy vehicle factors for both study intersections were 7% in the AM peak hour and 4% in the PM peak hour. These were obtained from actual counts and for the specific peak hours. The heavy vehicle factor was comparable to the Caltrans Truck Traffic: Annual Average Daily Truck Traffic (AADTT) (published in 2019) which showed an annual average of 6.21% of truck traffic between Oakville Cross and Rutherford Road. This data is for the average day and not for the specific peak hour. As the heavy vehicle percents were collected during the study peak hours, they represent the percentage for the peak hours only, not the average representation observed thru the day (ADT). This is why the truck percentage is higher than the average in the AM peak hour and lower in the PM peak hour. Therefore, the collected heavy vehicle percents were deemed more accurate than using AADT heavy vehicle percentages.

3.2 Traffic Operations

The existing traffic operations for 2022 was quantified as a baseline for current/existing delay and LOS. Table 3.3 presents the LOS results and queuing characteristics for the existing condition at the two study intersections. As shown, the LOS at both study intersections are below the threshold for acceptable traffic conditions, with excessive delay and queuing at the uncontrolled west- and -eastbound left-thru and left-thru-right movements.

3.2.1 Level of Service

The Route 29/Rutherford Road intersection experienced LOS E in the AM peak hour, and LOS F in both the PM and weekend peak hours. The westbound-left-thru movement experienced LOS F and the 95th percentile queue lengths were excessive across all peak periods for this movement. Further, the eastbound-left-thru-right movement experienced LOS E in the AM peak hour, with excessive 95th percentile queue lengths.

The Route 29/Oakville Cross Road intersection experienced LOS F across all peak periods, with both the westbound-left-thru and eastbound-left-thru-right movements both experiencing LOS F and excessive 95th percentile queue lengths.

All LOS calculation reports are provided in Appendix B.

Table 3.3: Existing Level of Service, Delay and Queuing Characteristics

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Weekend Peak Hour			
				Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage
1	**Route 29 & Rutherford Road**	TWSC	**D**	**35.5**	**E**	**-**	**-**	**256.2**	**F**	**-**	**-**	**219.4**	**F**	**-**	**-**
	NB Left		D	8.6	A	12	100	10.2	B	12	100	9.5	A	22	100
	NB Thru/Right		D	0.0	A	11	-	0.0	A	28	-	0.0	A	21	-
	WB Left/Thru		**D**	**66.4**	**F**	**54**	**-**	**OVR**	**F**	**234**	**-**	**OVR**	**F**	**134**	**-**
	WB Right		D	14.8	B	61	25	12.6	B	68	25	14.4	B	67	25
	SB Left		D	10.6	B	36	80	9.7	A	38	80	10.5	B	33	80
	SB Thru/Right		D	0.0	A	18	-	0.0	A	87	-	0.0	A	80	-
	EB Left/Thru/Right		**D**	**35.5**	**E**	**18**	**-**	**17.5**	**C**	**37**	**-**	**39.5**	**E**	**41**	**-**
2	**Route 29 & Oakville Cross Road**	TWSC	**D**	**68.9**	**F**	**-**	**-**	**254.7**	**F**	**-**	**-**	**72.5**	**F**	**-**	**-**
	NB Left		D	8.5	A	9	100	10.7	B	0	100	0.0	A	0	100
	NB Thru		D	0.0	A	35	-	0.0	A	54	-	0.0	A	48	-
	NB Right		D	0.0	A	37	25	0.0	A	33	25	0.0	A	28	25
	WB Left/Thru		**D**	**82.7**	**F**	**58**	**-**	**OVR**	**F**	**650**	**-**	**147.7**	**F**	**85**	**-**
	WB Right		D	12.5	B	48	50	10.6	B	93	50	11.9	B	60	50
	SB Left		D	11.7	B	38	100	9.3	A	33	100	10.5	B	33	100
	SB Thru/Right		D	0.0	A	0	-	0.0	A	26	-	0.0	A	0	-
	EB Left/Thru/Right		**D**	**68.9**	**F**	**37**	**-**	**44.9**	**E**	**55**	**-**	**65.1**	**F**	**22**	**-**

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

3.3 Safety Analysis

Collision data for the study intersections were provided by Caltrans' Traffic Accident Surveillance and Analysis System (TASAS) for the most recently available 3-year period between January 1, 2018, and December 31, 2020. Reported collisions include those occurring at or within 1500 feet of the study intersection location.

3.3.1 Study Intersection Collision Types

Table 3.4 presents a summary of the collision types reported at the two study intersections. Collisions by type at the study intersections are also shown in Figure 3.4.

Of the total number of collisions reported at the Oakville Cross Road intersection, more than half were broadside and hit object collision types, at 31% and 27%, respectively. Of the remaining collisions, rear end collisions were also common, with 23% of the total number of collisions reported as rear end collisions.

Of the 22 collisions reported at the Rutherford Road intersection, 9, or 41% were rear end collisions. Of the remaining collisions, sideswipe and hit object type collisions were the most reported collision type, comprising another 41% of the total number of collisions at the study intersection.

Additionally, the TASAS crash data analysis cites primary crash factors as the following for each study intersection:

Route 29/Oakville Cross Road

- Failure to Yield,
- Improper Turning,
- Speeding,
- Influence of Alcohol; and
- Other violations

Route 29/Oakville Cross Road

- Speeding,
- Improper Turning,

- Failure to Yield, and
- Other violations

Table 3.4: Collision Types (2018-2020)

Type of Collision	Intersection Location: Route 29 & Oakville Cross Road – Number of Collisions	Route 29 & Oakville Cross Road – Percent of Intersection Total	Route 29 & Rutherford Road – Number of Collisions	Route 29 & Rutherford Road – Percent of Intersection Total
Head-On	1	3.8%	2	9.1%
Sideswipe	4	15.4%	5	22.7%
Rear End	6	23.1%	9	40.9%
Broadside	8	30.8%	2	9.1%
Hit Object	7	26.9%	4	18.2%
Total Collisions	26	100%	22	100%

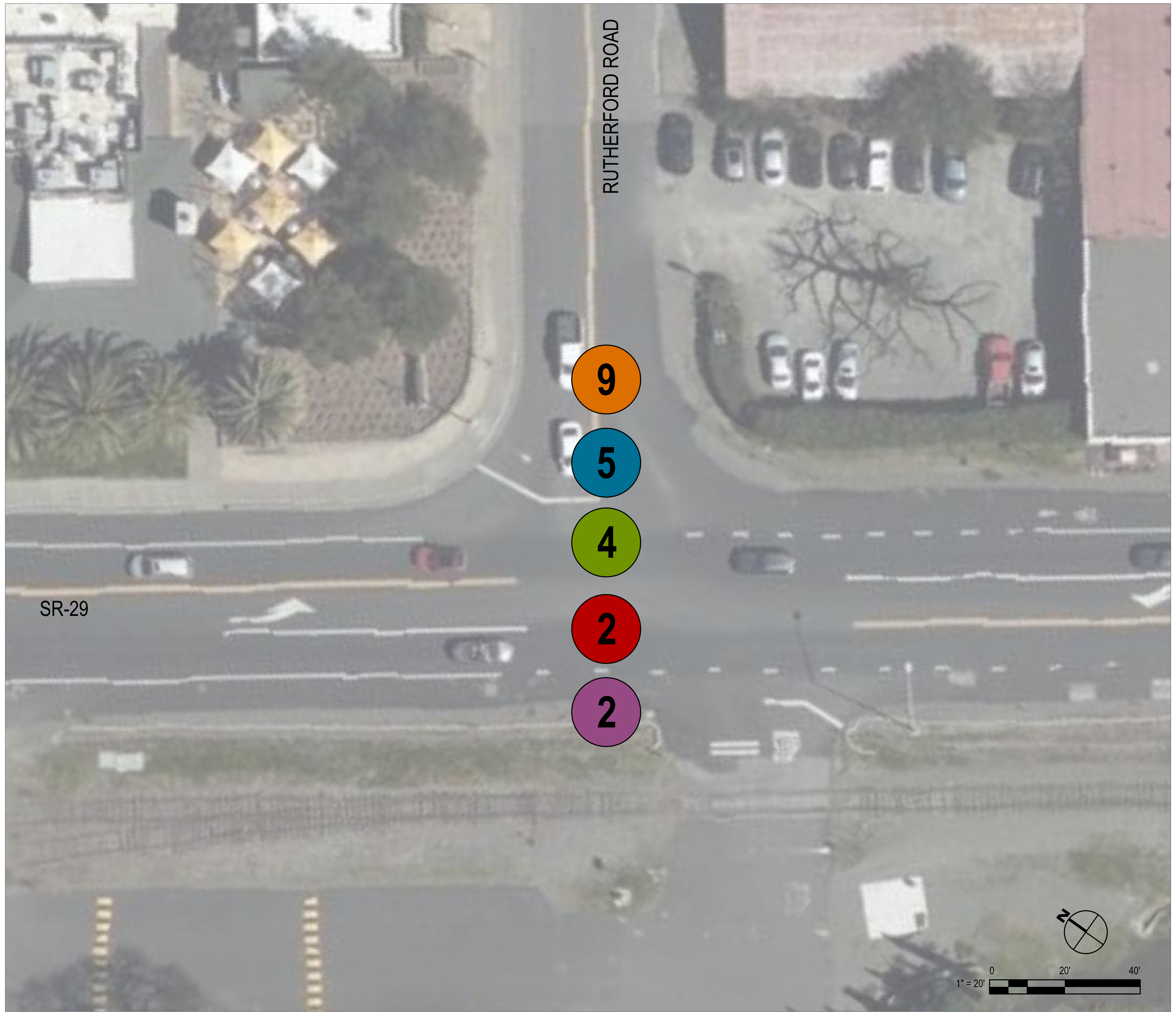
3.3.2 Study Intersection Crash Rates

Table 3.5 presents the collision rates for the study intersections compared to the average rate for similar facilities across the State of California, reported in the rate per million vehicle miles. As shown, there were 26 collisions reported at the Oakville Cross Road intersection, and 22 at the Rutherford Road intersection during the 3-year study period. While there was no fatal collision reported over the 3-year study period, the actual rates of “Fatal and Injury” and total collisions at the two study intersections were higher than the average for other similar facilities across the State.

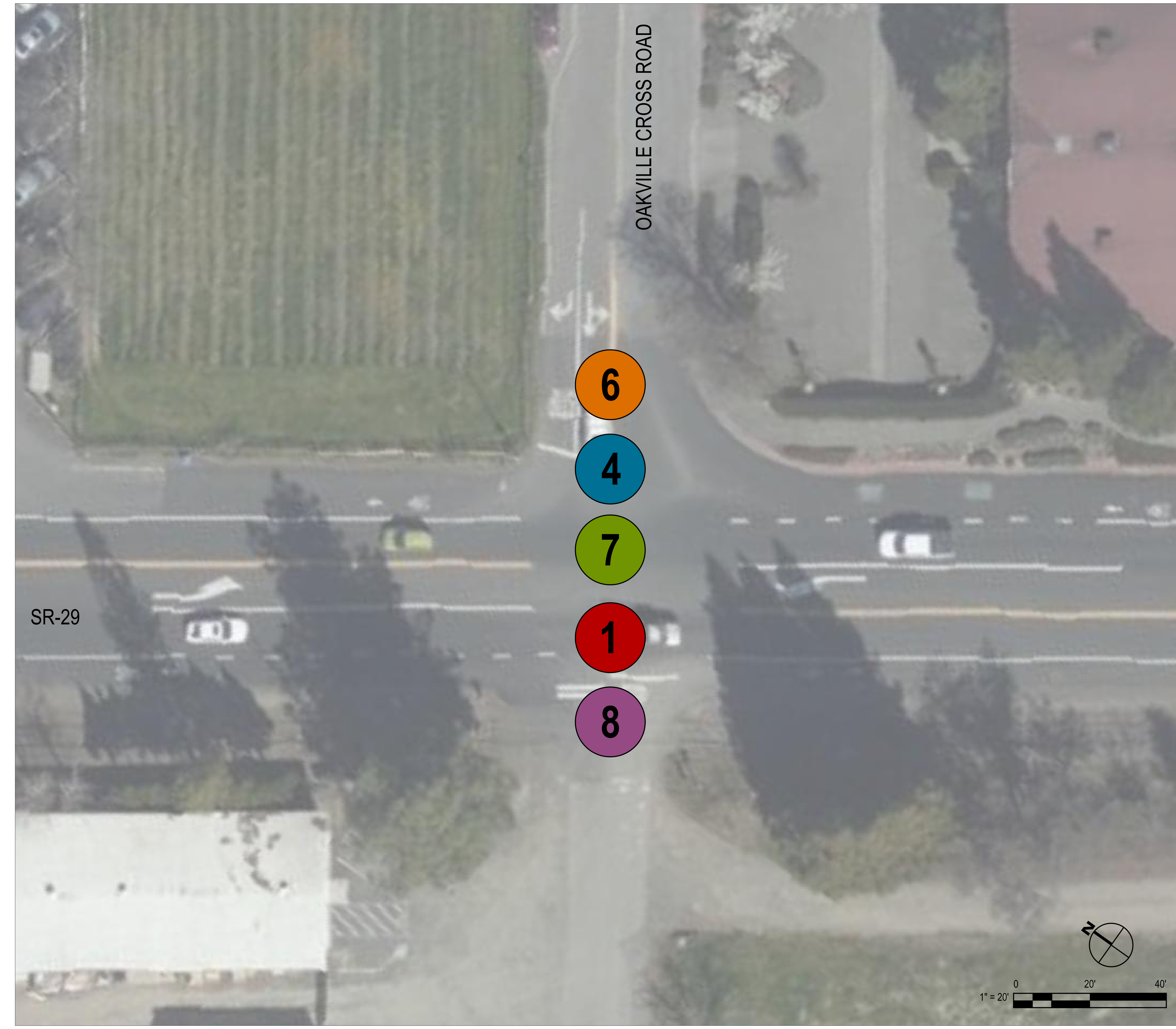
Table 3.5: Collision Rates

Location	Total # of Crashes	Actual Rates (per million vehicle miles)			Average Rates (per million vehicle miles)		
		Fatal Crashes	Fatal & Injury Crashes	Total[1]	Fatal Crashes	Fatal & Injury Crashes	Total[2]
Route 29 PM 22.520 Oakville Cross Road	26	0	0.61	1.38	0.020	0.34	0.79
Route 29 PM 24.595 Rutherford Road	22	0	0.40	1.46			

[1] All reported crashes (includes Property Damage Only (PDO) crashes)



Rutherford Rd / SR-29 Intersection



Oakville Cross Rd / SR-29 Intersection

NOTE

Numbers represent the actual number of crashes within the segment of combined directions of NAP 29 at 1500 FT in either direction of the intersections between 01/01/2018 to 12/31/2020.

LEGEND

- Rear End
- Sideswipe
- Hit Object
- Head On
- Broadside

PRELIMINARY

No.	Issue	Checked	Approved	Date
Author	Drafting Check	Project Manager		
Designer	Design Check	Project Director		

Bar is one inch on original size sheet
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Cameron Park California 95682 USA
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Client

Project **MTC SR-29 INTERSECTION IMPROVEMENTS**

Project No. | Date | Scale

Title
FIGURE 3-4
TASAS Crash Data Analysis

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Sheet No.

Plot Date: 15 December 2021 - 5:08 PM   Plotted By: Stephanie Ledbetter   Filename: \\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\03 - Exhibits\TASAS\X-11227647-TASAS.dwg

3.4 Traffic Signal Warrant Analysis

Based on the request from the PDT, Warrants 1, 2, 3 and 7 were performed for the intersection of Route 29/Rutherford Road to see if the installation of a traffic signal is justified. The signal warrant worksheets are provided in Appendix E.

The results of the traffic warrant analysis are summarized in Table 3.6 below, Warrants 1, 2, and 3 are all met.

Table 3.6 Signal Warrant Summary Table

Condition	Warrant 1 - Eight-Hour Vehicular Volume[1]					Warrant 2 - Four-Hour Vehicular Volume		Warrant 3 - Peak Hour		Warrant 7 - Crash Experience
		Condition A		Condition B						
	Overall	100% Condition	80% Condition	100% Condition	80% Condition	100% Condition	70% Condition	100% Condition	70% Condition	
Existing Weekend Volumes	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No

Notes:
[1] The approach volumes for 4 of the 8 hours on Rutherford and Route 29 SB were based on observed 24 hour counts broken down into 15-minute increments south of the Route 29 /Rutherford intersection.

3.5 Multimodal Facilities

3.5.1 Bicycle Facilities

Class II and III bicycle facilities exist within the study area as described below. Existing bicycle facilities are shown in Figure 3.5 and are described below:

- Class II Bicycle Lanes
  - Route 29, between Rutherford Road and Oakville Cross Road
- Class III Bike Route
  - Oakville Cross Road between Route 29 and Silverado Trail

3.5.2 Pedestrian Facilities

Existing pedestrian facilities, such as sidewalks, crosswalks, and curb ramps exist only in some places at the study intersection locations. A description of pedestrian facilities at each location is described below.

Route 29 and Rutherford Road/Route 128

There is a curb ramp at the northeast corner of this intersection with sidewalk segments that wrap around the same corner. The sidewalk continues for about 700 feet to the east along the north side of Rutherford Road and about 150 feet north from the intersection along the east side of Route 29. There are no other sidewalks or curb ramps, and no marked crosswalks at the study intersection.

Route 29 and Oakville Cross Road

There is a curb ramp at the southeast corner of this intersection, with sidewalk segments that wrap around the same corner. The sidewalk continues for about 200 feet to the east along the south side of Oakville Cross Road and about 450 feet south from the intersection along the east side of Route 29. There are no other sidewalks or curb ramps, and no marked crosswalks at the study intersection.

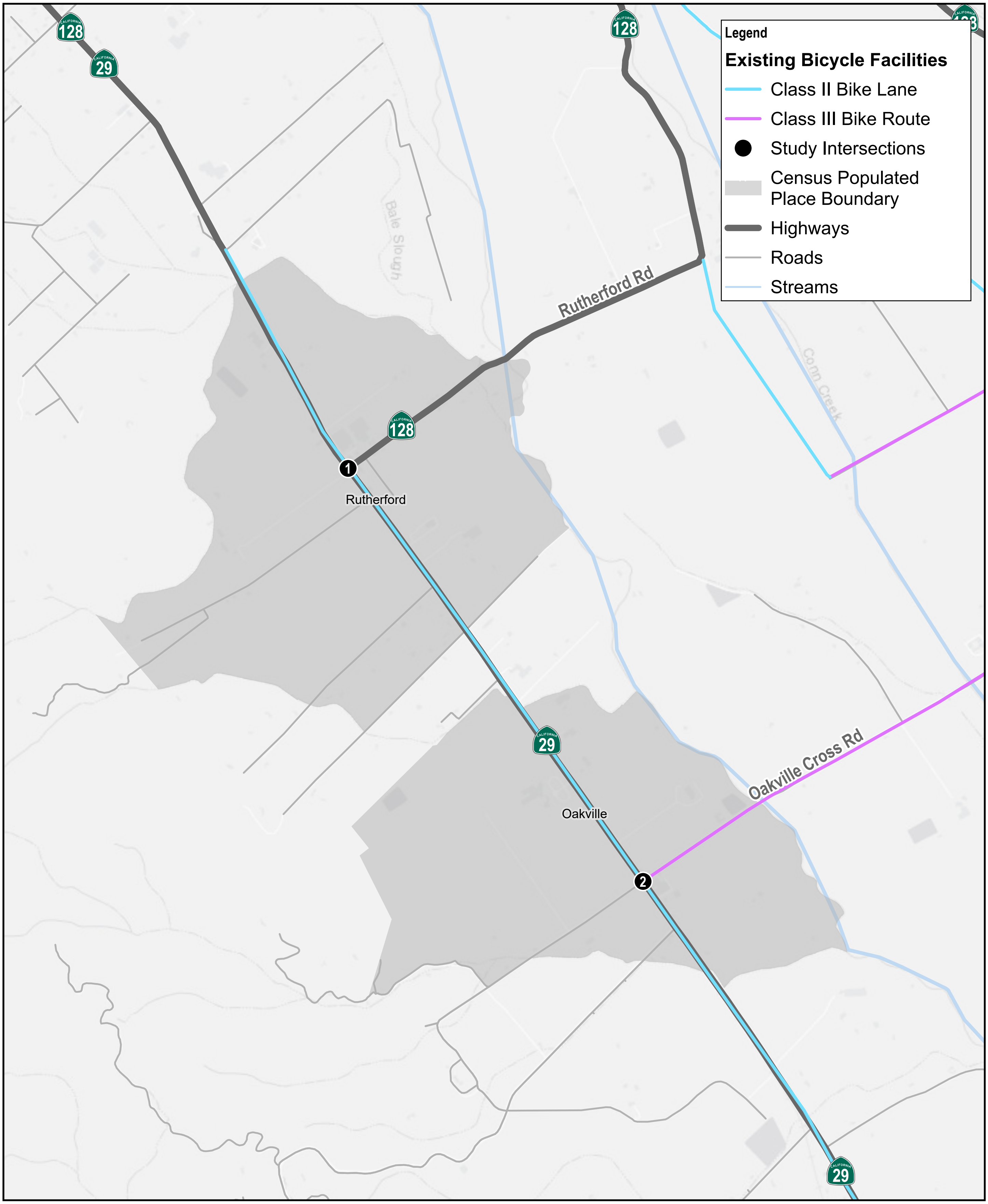
3.5.3 Existing Transit Service

Existing transit service within the study area is shown in Figure 3.6. Transit service along Route 29 between the study intersections includes two Vine Transit bus routes operated by the Napa Valley Transportation Authority (NVTA). These routes include Route 10 and Route 10X, which both run from Napa to Calistoga. Both routes provide local service between Napa Valley College and Calistoga, providing local service in Rutherford and Oakville near both study intersections.

3.5.4 Existing Rail Activity

The Napa Valley Wine Train is a privately owned train operator that serves as a tourist activity for Napa Valley's winemaking region, beginning at the Napa Train Station in downtown Napa and ending in St. Helena. The train runs along the Napa Valley Railroad, parallel and adjacent to the west side of Route 29. While the Napa Valley Wine Train schedule is adjusted frequently to match customer demands, the train currently operates a few round trips per day with crossings occurring at the study intersections between 10:15 a.m. and 8:20 p.m. The schedule is further dependent on the day of week and additional trips run as a charter service. Still, the general Northbound and Southbound times that train passes the Oakville and Rutherford intersections are as follows:

- OAKVILLE:
  - NB 11:51
  - NB 12:10
  - NB 18:45
  - SB 13:50
  - SB 15:30
  - SB 19:30
- RUTHERFORD
  - NB 12:00
  - NB 12:20
  - NB 19:00
  - SB 13:45
  - SB 15:25
  - SB 19:20



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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

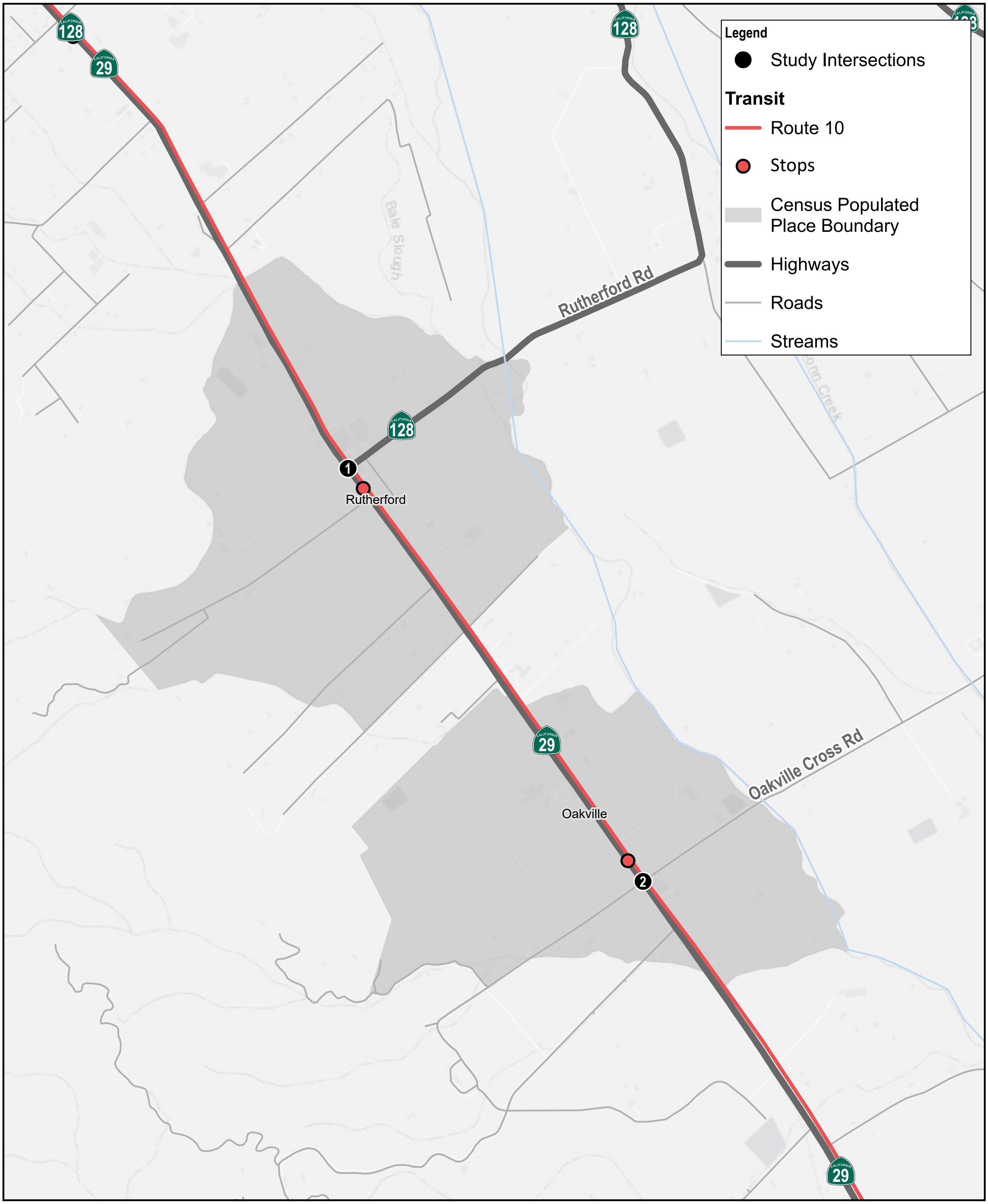
EXISTING BICYCLE FACILITIES

Project No. 11227647
Revision No. -
Date Feb 2023

FIGURE 3-5

\\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\08 - GIS\Maps\Deliverables\11227647_MTC SR 29 Intersections\11227647_MTC SR 29 Intersections.aprx - 11227647_Bicycle Facilities
Print date: 23 Feb 2023 - 19:19

Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA
Human Geography Base: County of Napa, Yolo County, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Bicycle Facilities: Napa County, 2021; Roads, Highways: TIGER, 2021.
Created by: pthornton



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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

EXISTING TRANSIT FACILITIES

Project No. 11227647
Revision No. -
Date Feb 2023

FIGURE 3-6

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Print date: 23 Feb 2023 - 19:20

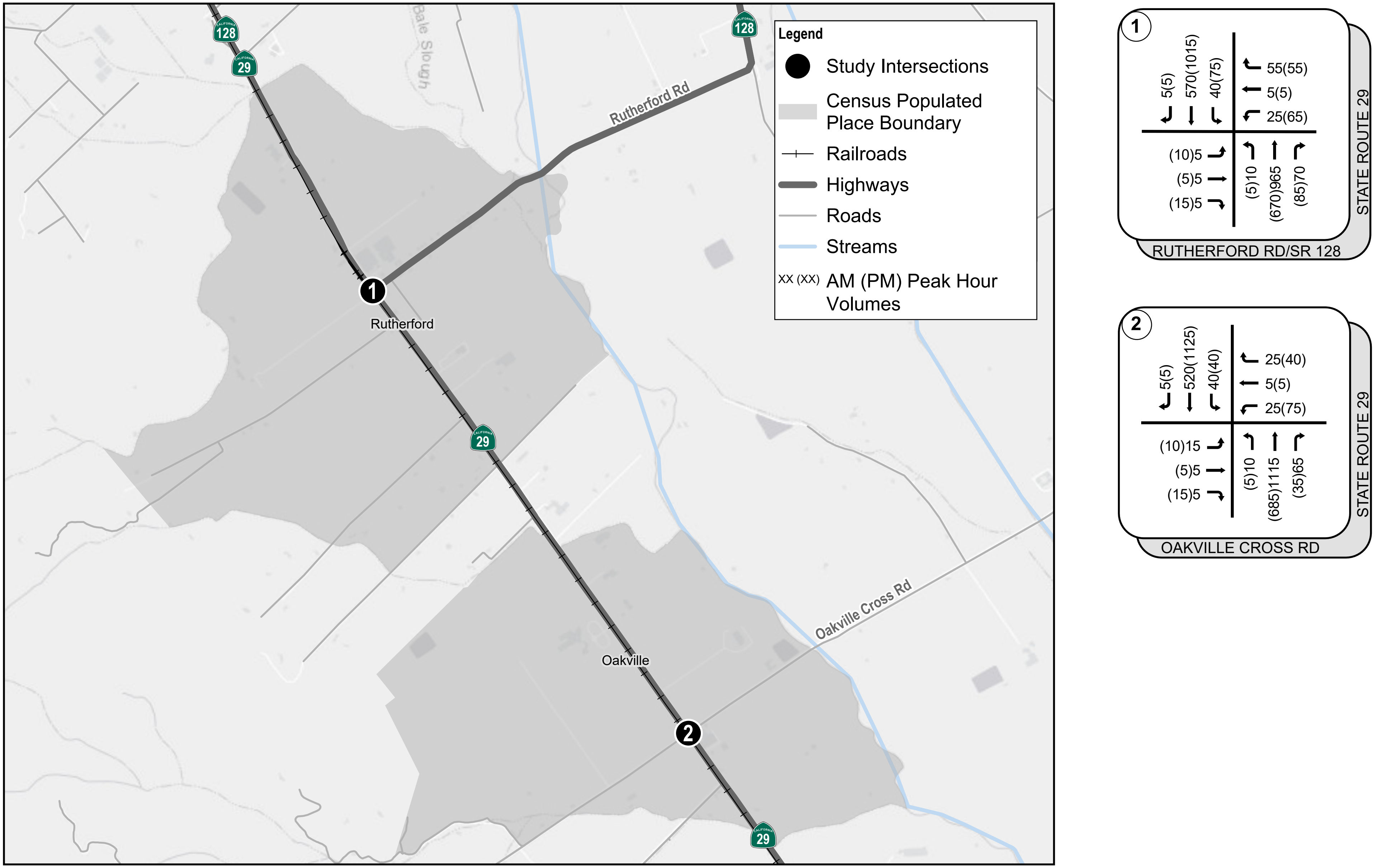
Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA
Human Geography Base: County of Napa, Yolo County, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA; Transit Facilities: MTC, 2021; Roads, Highways, TIGER, 2021.
Created by: pthornton

4. Design Conditions

4.1 Traffic Forecasts

Through coordination with the Metropolitan Transportation Commission (MTC), Napa County, and Caltrans District 4, an agreed methodology was used to develop the traffic forecast for Year 2025 (Opening Year) and Year 2035 (20-Year Forecast Design Year) at the study intersections. This methodology was documented in the technical memorandum titled *2025 and 2035 Forecasts*, which is provided in Appendix F.

The traffic volumes forecasted for the Opening Year (2025) weekday and weekend peak hour are shown in Figure 4.1 and Figure 4.2, respectively. The traffic volumes for Design Year (2035) weekday and weekend peak hour are shown in Figure 4.3 and Figure 4.4, respectively.



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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

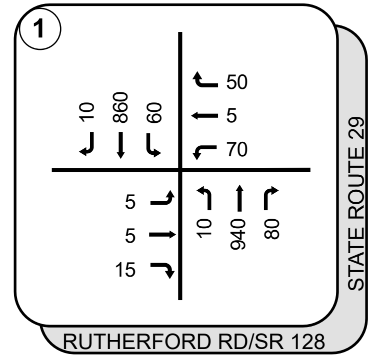
YEAR 2025 WEEKDAY PEAK HOUR TURNING MOVEMENT COUNTS

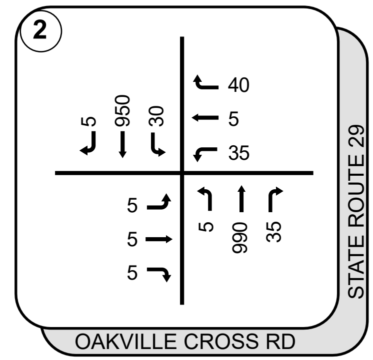
Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

FIGURE 4-1

\\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\08 - GIS\Maps\Deliverables\11227647_MTC SR 29 Intersections\11227647_MTC SR 29 Intersections.aprx - 11227647_Figure 3-1_TOAR_Existing Lane Geos
Print date: 23 Feb 2023 - 19:05

Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA; Roads, Highways: TIGER, 2021. Created by: pthornton





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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

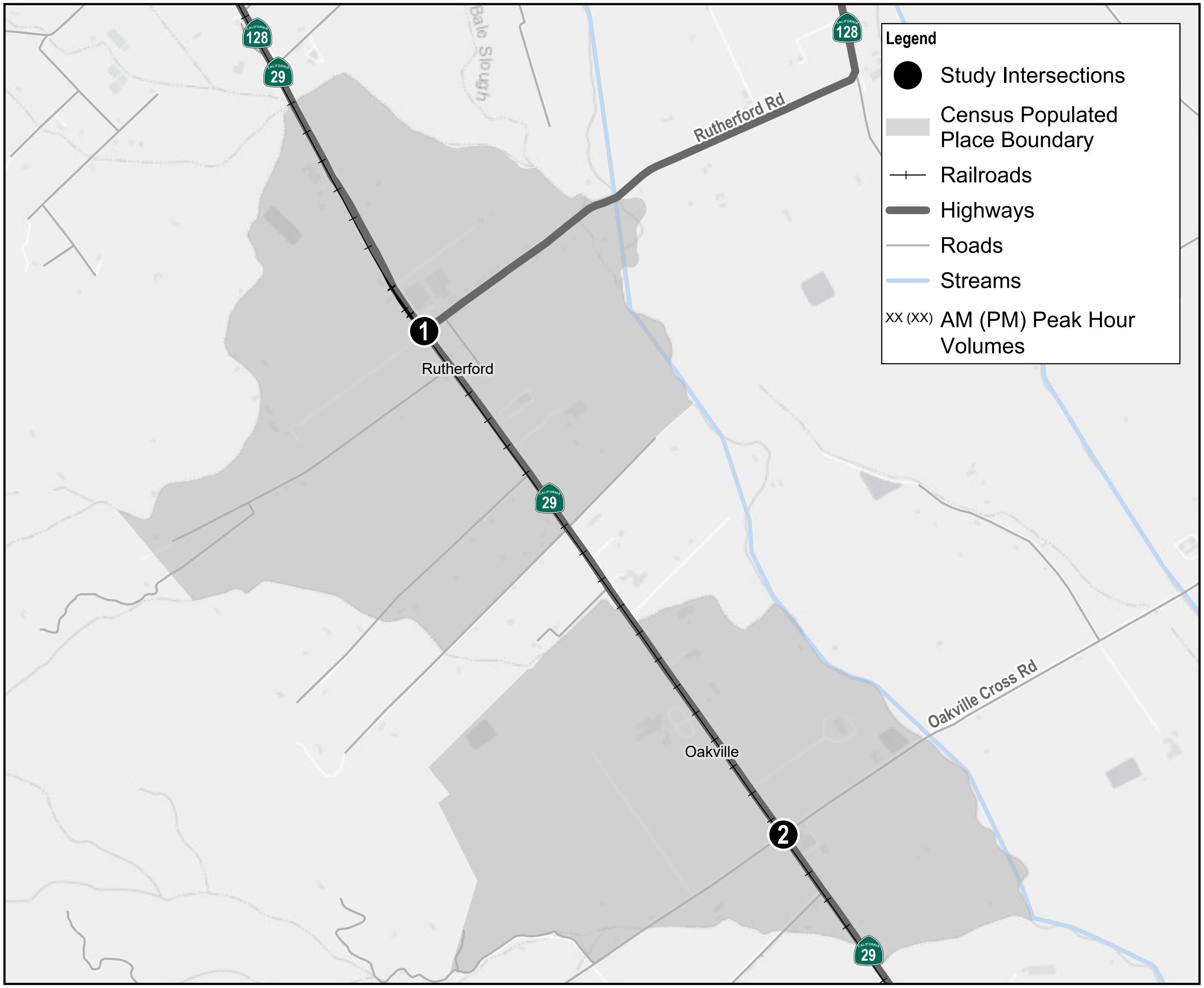
YEAR 2025 WEEKEND PEAK HOUR TURNING MOVEMENT COUNTS

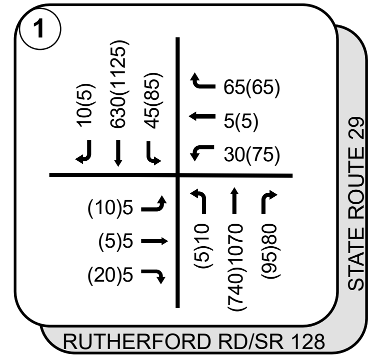
Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

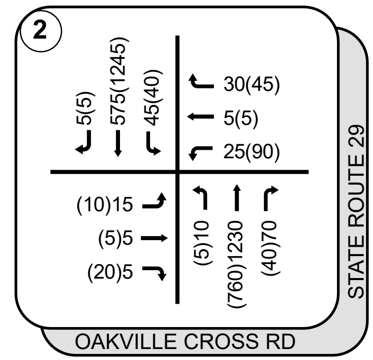
FIGURE 4-2

\\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\08 - GIS\Maps\Deliverables\11227647_MTC SR 29 Intersections\11227647_MTC SR 29 Intersections.aprx - 11227647_Figure 3-1_TOAR_Existing Lane Geos
Print date: 23 Feb 2023 - 19:05

Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA; Roads, Highways: TIGER, 2021. Created by: pthornton







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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

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METROPOLITAN TRANSPORTATION COMMISSION (MTC)

NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS

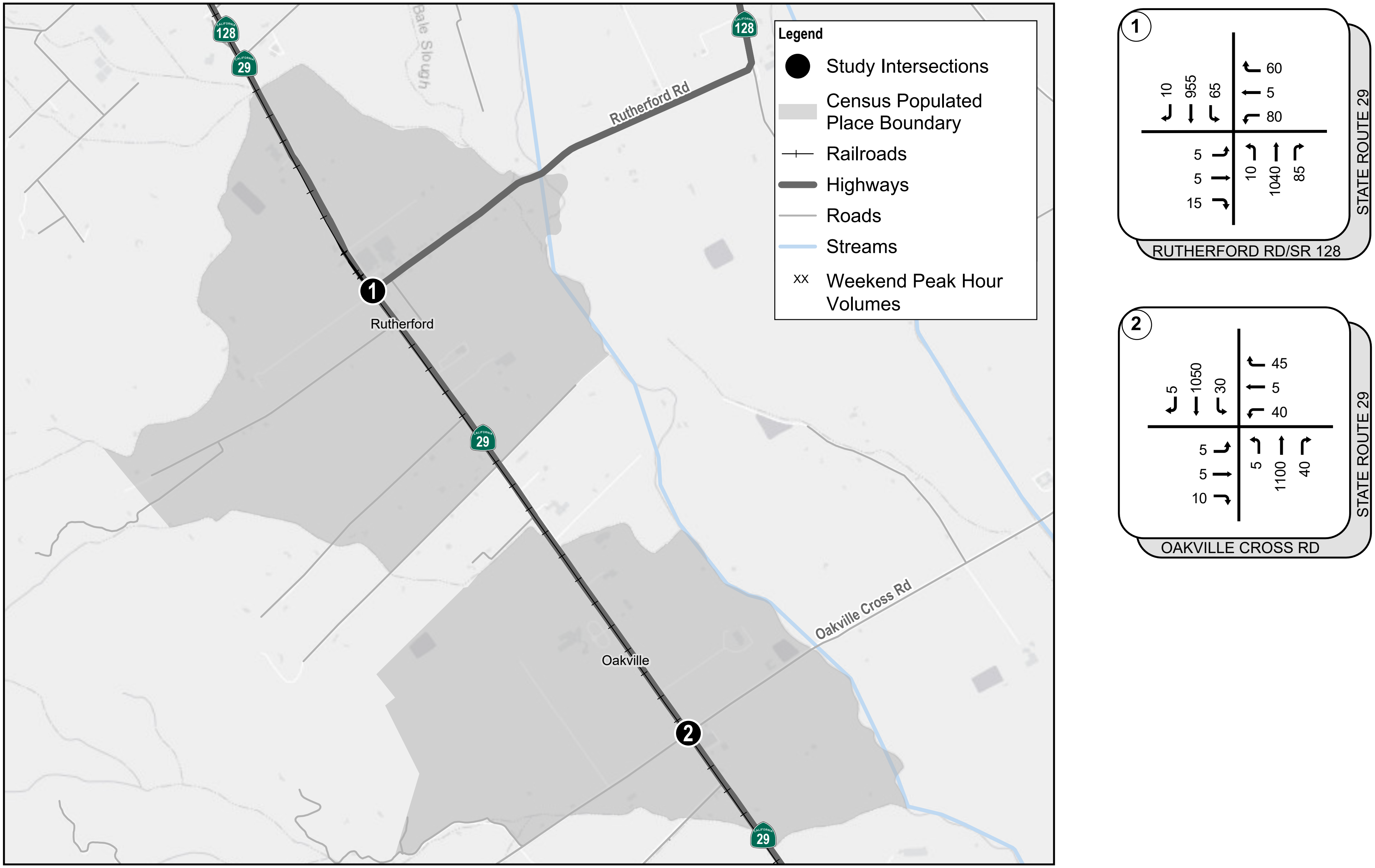
YEAR 2035 WEEKDAY PEAK HOUR TURNING MOVEMENT COUNTS

Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

FIGURE 4-3

\\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\08 - GIS\Maps\Deliverables\11227647_MTC SR 29 Intersections\11227647_MTC SR 29 Intersections.aprx - 11227647_Figure 3-1_TOAR_Existing Lane Geos
Print date: 23 Feb 2023 - 19:05

Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA; Roads, Highways: TIGER, 2021. Created by: pthornton



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Map Projection: Lambert Conformal Conic
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METROPOLITAN TRANSPORTATION COMMISSION (MTC)
NAPA VALLEY FORWARD 2R 29 SAFETY & OPERATIONAL INTERSECTION IMPROVEMENTS
YEAR 2035 WEEKEND PEAK HOUR TURNING MOVEMENT COUNTS

Project No. **11227647**
Revision No. **-**
Date **Feb 2023**

FIGURE 4-4

\\ghdnet\ghd\US\Cameron Park\Projects\561\11227647\08 - GIS\Maps\Deliverables\11227647_MTC SR 29 Intersections\11227647_MTC SR 29 Intersections.aprx - 11227647_Figure 3-1_TOAR_Existing Lane Geos
Print date: 23 Feb 2023 - 19:05

Data source: World Light Gray Canvas Base: County of Napa, Sonoma County, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA; Roads, Highways: TIGER, 2021. Created by: pthornton

5. No Build Conditions

The No Build alternative is the analysis scenario in which no intersection improvements are made before the project opening year, Year 2025, and the design year, Year 2035. All LOS calculation reports are provided in Appendix B.

5.1 Year 2025 No Build Conditions

Table 5.1 presents the LOS results and queuing characteristics for the Opening Year (2025). As shown, the LOS is below the threshold for acceptable conditions, with both study intersections experiencing LOS F and excessive delays across all three peak periods. As was the case with existing traffic operations at these locations, the uncontrolled WB left-thru and EB left-thru-right movements are causing LOS F conditions and excessive delay, with delay and queuing worse at Year 2025 than at the existing condition.

Table 5.1: Year 2025 No Build Intersection Level of Service and Queuing Characteristics

				AM Peak Hour				PM Peak Hour				Weekend Peak Hour			
#	Intersection	Control Type[1,2]	Target LOS	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage
1	**Route 29 & Rutherford Road**	**TWSC**	**D**	**51.0**	**F**	**-**	**-**	**283.2**	**F**	**-**	**-**	**OVR**	**F**	**-**	**-**
	NB Left		D	8.7	A	15	100	10.4	B	19	100	9.7	A	21	100
	NB Thru/Right		D	0.0	A	8	-	0.0	A	29	-	0.0	A	25	-
	WB Left/Thru		**D**	**94.4**	**F**	**66**	**-**	**OVR**	**F**	**361**	**-**	**OVR**	**F**	**571**	**-**
	WB Right		D	15.5	C	64	25	12.5	B	70	25	15.0	B	68	25
	SB Left		D	10.8	B	34	80	9.7	A	34	80	10.8	B	31	80
	SB Thru/Right		D	0.0	A	34	-	0.0	A	85	-	0.0	A	84	-
	EB Left/Thru/Right		**D**	**51.0**	**F**	**40**	**-**	**80.4**	**F**	**96**	**-**	**63.2**	**F**	**73**	**-**
2	**Route 29 & Oakville Cross Road**	**TWSC**	**D**	**86.0**	**F**	**-**	**-**	**OVR**	**F**	**-**	**-**	**154.1**	**F**	**-**	**-**
	NB Left		D	8.6	A	12	100	10.9	B	13	100	10.0	A	12	100
	NB Thru		D	0.0	A	52	-	0.0	A	48	-	0.0	A	63	-
	NB Right		D	0.0	A	40	25	0.0	A	31	25	0.0	A	33	25
	WB Left/Thru		**D**	**114.2**	**F**	**71**	**-**	**OVR**	**F**	**1430**	**-**	**296.2**	**F**	**220**	**-**
	WB Right		D	12.6	B	54	50	10.6	B	87	50	12.0	B	91	50
	SB Left		D	11.8	B	40	100	9.3	A	34	100	10.6	B	32	100
	SB Thru/Right		D	0.0	A	3	-	0.0	A	19	-	0.0	A	14	-
	EB Left/Thru/Right		**D**	**86.0**	**F**	**50**	**-**	**77.5**	**F**	**67**	**-**	**87.5**	**F**	**54**	**-**

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

5.2 Year 2035 No Build Conditions

Table 5.2 presents the LOS results and queuing characteristics at the study intersections for the 2035 Design Year. Both intersections experience LOS F conditions and excessive delay, again with the uncontrolled west- and eastbound movements causing these issues.

Table 5.2: 2035 No Build Intersection Level of Service and Queuing Characteristics

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM LOS	AM 95th Percentile Queue (ft)	AM Available Storage	PM Peak Hour Delay	PM LOS	PM 95th Percentile Queue (ft)	PM Available Storage	Weekend Peak Hour Delay	Weekend LOS	Weekend 95th Percentile Queue (ft)	Weekend Available Storage
1	**Route 29 & Rutherford Road**	**TWSC**	**D**	**74.9**	**F**	**-**	**-**	**OVR**	**F**	**-**	**-**	**OVR**	**F**	**-**	**-**
	NB Left		D	9.0	A	16	100	10.9	B	17	100	10.1	B	24	100
	NB Thru/Right		D	0.0	A	17	-	0.0	A	29	-	0.0	A	27	-
	WB Left/Thru		**D**	**180.8**	**F**	**76**	**-**	**OVR**	**F**	**599**	**-**	**OVR**	**F**	**595**	**-**
	WB Right		D	17.3	C	63	25	13.3	B	71	25	16.6	C	72	25
	SB Left		D	11.6	B	34	80	10.1	B	40	80	11.5	B	39	80
	SB Thru/Right		D	0.0	A	34	-	0.0	A	90	-	0.0	A	86	-
	EB Left/Thru/Right		**D**	**74.9**	**F**	**41**	**-**	**135.4**	**F**	**92**	**-**	**102.5**	**F**	**52**	**-**
2	**Route 29 & Oakville Cross Road**	**TWSC**	**D**	**143.1**	**F**	**-**	**-**	**OVR**	**F**	**-**	**-**	**OVR**	**F**	**-**	**-**
	NB Left		D	8.8	A	15	100	11.6	B	16	100	10.5	B	8	100
	NB Thru		D	0.0	A	53	-	0.0	A	58	-	0.0	A	68	-
	NB Right		D	0.0	A	38	25	0.0	A	35	25	0.0	A	30	25
	WB Left/Thru		**D**	**189.1**	**F**	**195**	**-**	**OVR**	**F**	**1346**	**-**	**OVR**	**F**	**267**	**-**
	WB Right		D	13.4	B	64	50	11.0	B	91	50	12.8	B	90	50
	SB Left		D	12.7	B	40	100	9.7	A	34	100	11.2	B	29	100
	SB Thru/Right		D	0.0	A	5	-	0.0	A	24	-	0.0	A	20	-
	EB Left/Thru/Right		**D**	**143.1**	**F**	**55**	**-**	**118.0**	**F**	**60**	**-**	**112.3**	**F**	**52**	**-**

Notes:

1. TWSC = Two Way Stop Control
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3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

6. Build Conditions

In order to reduce traffic congestion and enhance safety two build alternatives have been developed for each of the two study intersections. The two build alternatives considered at each location are described below.

6.1 Alternative 1 – Roundabout

6.1.1 Route 29/Rutherford Road – Roundabout

Alternative 1 at the Route 29/Rutherford Road intersection is a single lane 125' inscribed circle diameter (ICD) Compact Roundabout, which is presented in Appendix H. This alternative would include single lane approaches on all legs.

The compact roundabout would allow for lowered speeds through the intersection, safer turning movements for all vehicle approaches, and U-turn movement for all vehicles, including trucks, while being significantly less expensive and reducing right of way impacts when compared to a modern full-size roundabout.

Impacts associated with the roundabout include new right of way acquisition, removal of parking at the southeast corner of the intersection, impacts to Rutherford Grill property at the northeast corner, mainline channelization, and minimal impacts to railroad tracks.

6.1.2 Route 29/Oakville Cross Road – Roundabout

Alternative 1 at the Route 29/Oakville Cross Road intersection is a single lane 120' ICD Compact Roundabout, which is presented in Appendix H. This alternative would include single lane approaches on all legs.

The roundabout would allow for lowered speeds through the intersection, safer turning movements for all vehicle approaches, and U-turn movement for all vehicles, including trucks. Impacts associated with the roundabout include new right of way acquisition, removal of parking at the southeast corner of the intersection, removal of the vineyard at the northeast corner of the intersection, mainline channelization, and minimal impacts to railroad tracks, namely reconstruction of the grade crossing with no impact to the Napa Valley Wine Train tracks.

6.2 Alternative 1 Operations

The roundabout operational analysis for Year 2025 and 2035 for both intersections is discussed in the following sections.

6.2.1 Year 2025 Roundabout Operational Analysis

This traffic analysis evaluates the Year 2025 Opening Conditions with the Roundabout Build Alternative at both study intersections. Table 6.1 presents the weekday AM and PM and weekend peak hour LOS, delay, and queuing characteristics for the Year 2025. Both intersections operate at an acceptable LOS.

Table 6.1: Alternative 1 – Roundabout – Year 2025 LOS and Queuing Characteristics

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Weekend Peak Hour			
				Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage
1	Route 29 & Rutherford Road	RNDBT	D	5.3	A	-	-	6.0	A	-	-	5.8	A	-	-
	NB Left/Thru/Right		D	4.9	A	338.2	-	4.8	A	164.0	-	4.9	A	296.8	-
	WB Left/Thru/Right		D	15.3	B	35.6	-	11.6	B	29.5	-	15.2	B	45.1	-
	SB Left/Thru/Right		D	4.6	A	111.9	-	5.8	A	425.5	-	5.3	A	247.9	-
	EB Left/Thru/Right		D	9.9	A	3.0	-	18.5	B	18.2	-	12.8	B	8.8	-
2	Route 29 & Oakville Cross Road	RNDBT	D	6.3	A	-	-	6.2	A	-	-	5.0	A	-	-
	NB Left/Thru/Right		D	6.2	A	699.0	-	4.4	A	144.1	-	4.4	A	263.7	-
	WB Left/Thru/Right		D	23.2	C	47.0	-	12.4	B	27.0	-	14.9	B	26.5	-
	SB Left/Thru/Right		D	4.6	A	101.5	-	6.3	A	589.1	-	4.6	A	267.1	-
	EB Left/Thru/Right		D	11.2	B	4.8	-	23.2	C	25.8	-	13.9	B	5.0	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

6.2.2 Year 2035 Roundabout Operational Analysis

This traffic analysis evaluates the Year 2035 Design Year Conditions with the Roundabout Build Alternative at both study intersections. Table 6.2 presents the weekday AM and PM and weekend peak hour LOS, delay, and queuing characteristics for the Year 2035. Both intersections operate at an acceptable LOS.

Table 6.2: Alternative 1 – Roundabout – Year 2035 LOS and Queuing Characteristics

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Weekend Peak Hour			
				Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage
1	Route 29 & Rutherford Road	RNDBT	D	5.4	A	-	-	6.0	A	-	-	5.8	A	-	-
	NB Left/Thru/Right		D	4.8	A	326.1	-	4.7	A	168.4	-	4.8	A	287.1	-
	WB Left/Thru/Right		D	17.6	B	47.5	-	12.1	B	36.5	-	16.7	B	58.1	-
	SB Left/Thru/Right		D	4.6	A	116.1	-	5.7	A	440.5	-	5.2	A	255.4	-
	EB Left/Thru/Right		D	10.2	B	3.1	-	22.9	C	27.0	-	14.5	B	10.3	-
2	Route 29 & Oakville Cross Road	RNDBT	D	6.0	A	-	-	6.3	A	-	-	5.0	A	-	-
	NB Left/Thru/Right		D	5.7	A	636.2	-	4.3	A	144.3	-	4.3	A	247.5	-
	WB Left/Thru/Right		D	26.0	C	58.8	-	13.6	B	33.1	-	16.9	B	33.0	-
	SB Left/Thru/Right		D	4.6	A	101.5	-	3.2	A	605.0	-	4.5	A	259.2	-
	EB Left/Thru/Right		D	11.4	B	4.9	-	30.1	C	40.8	-	15.2	B	7.6	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

6.2.3 Roundabout Geometrics

The geometric feasibility of a two-lane roundabout was considered for the Route 29 and Oakville Cross Road intersection, but is not feasible due to the right-of-way constraints. Despite the right of way constraints, the single lane roundabout alternative provides superior benefits in delay, queues, and safety compared to the signal alternative, as documented in the following section.

6.3 Alternative 2 – Signal

6.3.1 Route 29/Rutherford Road – Signal

Alternative 2 consists of a signalized intersection with crosswalks at the north and east legs. The signal design concept is included in Appendix H. The concept includes the following improvements:

- Signalized intersection
- Protected northbound left and southbound left phases.
- Split phases for the eastbound and westbound approaches (split phases were used for a more conservative delay analysis)

6.3.2 Route 29/Oakville Cross Road – Signal

The Signal Build Alternative (Alternative 2) for the Route 29 and Oakville Cross Road intersection is included in Appendix H. The concept includes the following improvements:

- Signalized intersection
- Protected northbound left and southbound left phases.
- Split phases for the eastbound and westbound approaches (split phases were used for a more conservative delay analysis)

6.4 Alternative 2 Operations

The signal build operational analysis for Year 2025 and Year 2035 for both intersections is discussed in the following sections.

6.4.1 Year 2025 Signal Build Conditions Operational Analysis

This traffic analysis evaluates the Year 2025 Opening Conditions with the Signal Build Alternative at both study intersections. Table 6.3 presents the weekday AM and PM and weekend peak hour LOS, delay and queuing characteristics for the Year 2025. Both intersections operate at an acceptable LOS, however, several lanes operate below the LOS threshold.

Table 6.3: Alternative 2 – Signal – Year 2025 LOS and Queuing Characteristics

				AM Peak Hour				PM Peak Hour				Weekend Peak Hour			
#	Intersection	Control Type[1,2]	Target LOS	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage
1	Route 29 & Rutherford Road	Signal	D	25.9	C	-	-	26.2	C	-	-	28.3	C	-	-
	NB Left		**D**	51.2	D	53	100	**52.0**	**D**	**39**	100	**57.0**	**E**	**55**	100
	NB Thru/Right		**D**	**57.1**	**E**	**671**	**-**	21.6	C	517	**-**	34.2	C	854	**-**
	WB Left/Thru		D	48.9	D	66	-	42.1	D	116	-	51.1	D	112	-
	WB Right		D	51.2	D	86	25	41.9	D	85	25	50.0	D	88	25
	SB Left		D	52.5	D	78	80	43.8	D	111	80	52.0	D	99	80
	SB Thru/Right		D	9.8	A	230	-	25.7	C	620	-	15.4	B	393	-
	EB Left/Thru/Right		**D**	**55.8**	**E**	**45**	**-**	45.7	D	58	**-**	54.1	D	51	**-**
2	Route 29 & Oakville Cross Road	Signal	D	23.1	C	-	-	28.1	C	-	-	21.9	C	-	-
	NB Left		**D**	51.3	D	52	100	**59.4**	**E**	**22**	100	**50.7**	**D**	**26**	100
	NB Thru		D	28.5	C	1905	-	15.8	B	376	-	25.0	C	521	-
	NB Right		D	6.1	A	56	25	9.7	A	47	25	8.7	A	51	25
	WB Left/Thru		D	53.1	D	78	-	51.0	D	116	-	40.5	D	73	-
	WB Right		D	53.1	D	57	50	48.8	D	77	50	40.8	D	66	50
	SB Left		D	46.6	D	79	100	52.0	D	93	100	44.3	D	74	100
	SB Thru/Right		D	6.4	A	203	-	32.1	C	652	-	16.4	B	331	-
	EB Left/Thru/Right		**D**	**62.7**	**E**	**59**	**-**	53.0	D	63	**-**	46.8	D	46	**-**

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

6.4.2 Year 2035 Signal Build Conditions Operational Analysis

This traffic analysis evaluates the Year 2035 Design Year Conditions with the Signal Build Alternative at both study intersections. Table 6.4 presents the weekday AM and PM and weekend peak hour LOS, delay, and queuing characteristics for the Year 2035. Both intersections operate at an acceptable LOS, however, several lanes operate below the LOS threshold.

Table 6.4: Alternative 2 – Signal – Year 2035 LOS and Queuing Characteristics

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Weekend Peak Hour			
				Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage	Delay	LOS	95th Percentile Queue (ft)	Available Storage
1	Route 29 & Rutherford Road	Signal	D	35.4	D	-	-	32.8	C	-	-	36.1	D	-	-
	NB Left		**D**	**65.2**	**E**	**48**	**100**	**59.5**	**E**	**50**	**100**	**62.4**	**E**	**59**	**100**
	NB Thru/Right		D	45.9	D	769	-	23.8	C	636	-	47.4	D	1565	-
	WB Left/Thru		**D**	**57.3**	**E**	**83**	**-**	**51.0**	**D**	**118**	**-**	**58.1**	**E**	**129**	**-**
	WB Right		**D**	**61.1**	**E**	**92**	**25**	**50.7**	**D**	**100**	**25**	**56.7**	**E**	**97**	**25**
	SB Left		**D**	**60.6**	**E**	**80**	**80**	**52.5**	**D**	**120**	**80**	**57.8**	**E**	**99**	**80**
	SB Thru/Right		D	9.7	A	262	-	34.9	C	961	-	17.3	B	463	-
	EB Left/Thru/Right		**D**	**63.8**	**E**	**47**	**-**	**52.8**	**D**	**69**	**-**	**59.4**	**E**	**49**	**-**
2	Route 29 & Oakville Cross Road	Signal	D	35.1	D	-	-	40.7	D	-	-	26.4	C	-	-
	NB Left		**D**	**55.8**	**E**	**47**	**100**	**63.6**	**E**	**30**	**100**	**60.8**	**E**	**24**	**100**
	NB Thru		D	47.7	D	5103	-	17.2	B	479	-	30.8	C	786	-
	NB Right		D	6.0	A	53	25	9.6	A	50	25	8.3	A	46	25
	WB Left/Thru		**D**	**57.8**	**E**	**77**	**-**	**57.4**	**E**	**160**	**-**	**50.7**	**D**	**93**	**-**
	WB Right		**D**	**60.1**	**E**	**61**	**50**	53.6	D	81	**50**	51.2	D	74	**50**
	SB Left		**D**	51.0	D	96	100	**56.2**	**E**	**93**	100	**54.2**	**D**	**75**	100
	SB Thru/Right		D	6.4	A	251	-	53.2	D	2319	-	18.9	B	414	-
	EB Left/Thru/Right		**D**	**68.5**	**E**	**58**	**-**	**56.8**	**E**	**68**	**-**	**55.8**	**E**	**53**	**-**

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. **Bold** = Unacceptable Conditions
5. OVR = Delay over 300 seconds

6.5 Impact of Railroad on Operations

The existing traffic patterns were reviewed for movements on the mainline that may conflict with railroad crossings and have an impact on traffic operations with either the signal or the roundabout alternative. The Napa Valley Wine Train operates outside the traditional AM peak period but does operate a few trips during the PM Peak period.

Under Existing conditions, the southbound right turn traffic at both Oakville Cross Road and Rutherford Road have a refuge in the shoulder/bike lane which minimizes disruption to the southbound through traffic during the train crossing. The northbound left turns have turn pockets and the traffic will wait in the pockets during the train crossing.

The following are the traffic patterns summarized based on the existing data collected over a 4 hour period in the afternoon from 3 pm to 7 pm:

- Rutherford Road intersection: 12 vehicles turning northbound left and 6 vehicles turning southbound right during the 4 hour period, which translates to an average of 3 northbound left and 1.5 southbound right turning vehicles per hour, respectively.
- Oakville Cross Road intersection: 3 vehicles turning northbound left and 3 vehicles turning southbound right during the 4 hour period, which translates to an average of 1 turning vehicle per hour for both directions.

Based on the above data, it can be inferred that the frequency of vehicles crossing from the mainline towards the railroad track and eventually to their destination is very low.

With either the roundabout or the signal alternative, the crossing is expected to be controlled along the west leg of both the intersections with a crossing time of two to two and half minutes. Furthermore, there will be room to store a minimum of one vehicle. Due to the volume of traffic being extremely low combined with the ability to store one vehicle, operations for through traffic are not expected to be disrupted.

7. Sensitivity Analysis

A sensitivity analysis was completed to test if the proposed roundabout geometry at the intersection of State Route 29 and Oakville Cross Road can accommodate variations in traffic. The sensitivity analysis was specifically performed to assess the future year (service life) through which the roundabout will operate at a practical degree of saturation (defined by volume/capacity over 0.85). It should be noted that the practical degree of saturation of 0.85 was established in the 2000 FHWA publication titled *Roundabouts*: *An Informational Guide* and the subsequent 2010 roundabout guide, National Cooperative Highway Research Program (NCHRP) Report 672.

7.1 National Cooperative Highway Research Program 1043

The following excerpts are quoted from the NCHRP 1043 (Guide for roundabouts 2023):

- “NCHRP is supported on a continuing basis by funds from participating member states of AASHTO and receives the full cooperation and support of the Federal Highway Administration (FHWA)”
- “NCHRP Research Report 1043: Guide for Roundabouts provides information and guidance on all aspects of roundabouts and supersedes NCHRP Report 672: Roundabouts: An Informational Guide—Second Edition”
- “The information contained in NCHRP Research Report 1043 will help highway agencies and other organizations address relevant issues when considering the planning and implementation of roundabouts”
- “A volume-to-capacity ratio of 0.85 (in other words degree of saturation or practical capacity) need not be considered an absolute threshold; in fact, acceptable operations may be achieved at higher ratios”
- “Using hourly time periods for analysis of future conditions (i.e., peak hour factor of 1) instead of peak 15-minute time periods. Forecasted volumes rarely have the level of detail to support 15-minute time periods” is supported by the Guide.
- “Conducting a sensitivity analysis to evaluate whether changes in traffic volume assumptions, lane configuration, or other geometric features have dramatic impacts on delay or queues” is supported by the Guide.

7.2 Traffic Operations

We understand that Caltrans has not formally adopted NCHRP 1043 as the overarching roundabout guide. As such we are performing the sensitivity analysis for the practical capacity (v/c of 0.85). However, consistent with our discussion during the focus meeting held August 2, 2023, we performed the sensitivity analysis using the following parameters consistent with Caltrans policies and the latest recommendations from the NCHRP 1043:

- Environmental Factor 1.0 (as we are performing an assessment of geometric needs for future conditions)
- Peak Hour Factor 1.0
- An average growth rate of 1.23% per year which was derived based on the future forecasts approved by the Caltrans Forecasting unit for the subject intersection

With the above inputs, the expected service life at the practical capacity (v/c of 0.85) was found to be 12 years. It should be noted that 95% queues are sensitive to geometry in the northbound direction during the AM peak period (17 vehicles) and in the southbound direction during the PM peak period (17 vehicles).

8. Intersection Control Evaluation – Life Cycle Benefit/Cost Analysis

The following sections present a brief summary of the parameters used to assess and monetize the life cycle benefits and costs for each of the proposed Build alternatives.

8.1 Methodology

8.1.1 Safety Benefit

Safety costs associated with collisions anticipated for each proposed intersection improvement were quantified using the Caltrans Intersection Control Evaluation Collision Cost Analysis spreadsheet.

To compute the existing collision rate, existing collision data over a three-year period was utilized. The intersection ADT was converted to a Million Vehicle (MV) per year. The number of collisions were then divided by the total number of vehicles to obtain a collision rate (collision/MV). This determines the base cost of collisions for existing conditions.

Due to the high number of collisions in the project area, the monetized safety benefit is relatively high and gives both alternatives rather large cost benefit ratios.

The benefits of converting to a roundabout would reduce the number of conflict points for vehicles. Additionally, roundabouts reduce the entry speed of vehicles, reducing the severity of any collisions that do occur. Signal improvements will reduce congestion and provide dedicated phasing for turns off of side streets, which would in turn reduce potential collisions.

8.1.2 Vehicular Delay Reduction Benefit

To calculate the delay reduction benefit, the value of travel time was quantified for each proposed build alternative. Costs associated with vehicular delay were computed using the delay for the AM and PM peak hour periods of all the alternatives. In assessing the delay costs, the weighted average for costing the value of time for automobiles and trucks was used.

An average delay cost of $19.54/person/hour was used—a value escalated from the original value in the published data by Caltrans for Vehicle Operation Costs Parameters for 2016 (**https://dot.ca.gov/programs/transportation-planning/economics-datamanagement /transportation-economics/vehicle-operation-cost-parameters**). The rate was grown by 12% from the 2016 values, based on 2% per year, and was weighted based on heavy vehicle percentages. The delay reduction benefit, therefore, includes the reduction in delay in dollar amounts compared to No Build conditions.

8.1.3 Fuel Benefit

To calculate the fuel cost for the alternatives, the vehicle operating costs were quantified. The fuel costs (vehicle operating costs) were computed using the delay for the AM and PM peak hour periods of all alternatives. An average fuel price for regular unleaded automobile fuel of $4.09 was used based on the last year's average price at the pump.

8.1.4 Environmental Benefit

To calculate the environmental cost, the greenhouse gas emissions costs were quantified for the project. The health cost of Carbon Monoxide (CO) in a rural/suburban California town is $84/ton. The health cost of Nitrogen Oxide is $15,568/ton. The methodology for using the environmental costs comes from the ICE guidelines.

8.1.5 Construction Cost

Based on the concept-level preliminary project costs estimates, the total estimated project construction costs (including design, environmental, right of way, construction, and construction management costs) for each alternative are presented in the Life Cycle Cost Analysis tables presented in the following section.

8.1.6 Other Costs

Operation and maintenance costs are other important components of the cost associated with each alternative. The operation and maintenance costs for a traffic signal include providing power service to the signal and street lighting ($750/year), signal retiming ($1,000/year), and signal maintenance for power outages/new detector loops/etc. ($1,500/year).

The roundabout alternatives would have lower operation and maintenance costs limited to power service for street lighting ($750/year). These values are typical industry averages.

8.2 Life Cycle Benefit/Cost Summary

In evaluating the life-cycle costs of the project, a 15-year service life was used in comparing the No Build and Build Alternatives (Roundabout and Signal). In following Caltrans methodology and transportation economics, Caltrans Vehicle Operations Cost Parameters (2016 Current Dollar Value), the vehicle operations costs, collision costs, and emission cost parameters (CA rural area) were used. The life cycle costs for each of the study intersections are reported below.

8.2.1 Route 29 and Rutherford Road

As presented in Table 8.1, the No Build Alternative is expected to have life-cycle costs of $46,899,000 and the higher cost is mainly attributed to the collision costs. Table 8.2 presents the cost/benefit ratio for each alternative.

Table 8.1: Route 29 & Rutherford Road Life Cycle Costs

Life Cycle Costs (15 year design)	Roundabout Alternative	Traffic Signal Alternative	No Build Alternative
Collision and Mobility Costs			
Collision Costs of predicted crashes	$1,257,000	$17,037,000	$42,786,000
Delay Costs	$410,000	$2,220,000	$1,920,000
Fuel and GHG Costs	$1,503,000	$1,503,000	$2,176,000
Project Costs Including Design, Construction and Maintenance			
Operations and Maintenance Costs	$26,000	$45,000	$17,000
Construction Costs	$4,758,000	$1,193,000	$0
Total Life Cycle Costs	**$7,954,000**	**$21,998,000**	**$46,899,000**

Table 8.2: Route 29 & Rutherford Road Life Cycle Cost/Benefit Ratio

Life Cycle Benefit/Cost Ratio	No Build VS Roundabout	No Build VS Signal
Safety Benefit	$ 41,529,000	$ 25,749,000
Delay Reduction Benefit	$ 1,510,000	$ (300,000)
Fuel and GHG Benefit	$ 673,000	$ 673,000
Total Benefits	**$ 43,712,000**	**$ 26,122,000**
Added Operations & Maintenance Costs	$ 9,000	$ 28,000
Construction Costs	$ 4,758,000	$ 1,193,000
Total Costs	**$ 4,767,000**	**$ 1,221,000**
Life Cycle Benefit/Cost Ratio	**9.2**	**21.4**

8.2.2 Route 29 and Oakville Cross Road

As presented in Table 8.3, the No Build Alternative is expected to have life-cycle costs of $54,934,000 with the higher cost mainly attributed to the collision costs. Table 8.4 presents the cost/benefit ratio for each alternative.

Table 8.3: Route 29 & Oakville Cross Road Life Cycle Costs - No Build Alternative

Life Cycle Costs (15 year design)	Roundabout Alternative	Traffic Signal Alternative	No Build Alternative
Collision and Mobility Costs			
Collision Costs of predicted crashes	$1,496,000	$20,276,000	$50,919,000
Delay Costs	$520,000	$2,350,000	$1,660,000
Fuel and GHG Costs	$1,492,000	$1,451,000	$2,338,000
Project Costs Including Design, Construction and Maintenance			
Operations and Maintenance Costs	$26,000	$45,000	$17,000
Construction Costs	$4,281,000	$1,193,000	$0
Total Life Cycle Costs	**$7,815,000**	**$25,315,000**	**$54,934,000**

Table 8.4: Route 29 & Oakville Cross Road Life Cycle Cost/Benefit Ratio

Life Cycle Benefit/Cost Ratio	No Build VS Roundabout	No Build VS Signal
Safety Benefit	$ 49,423,000	$ 30,643,000
Delay Reduction Benefit	$ 1,140,000	$ (690,000)
Fuel and GHG Benefit	$ 846,000	$ 887,000
Total Benefits	**$ 51,409,000**	**$ 30,840,000**
Added Operations & Maintenance Costs	$ 9,000	$ 28,000
Construction Costs	$ 4,281,000	$ 1,193,000
Total Costs	**$ 4,290,000**	**$ 1,221,000**
Life Cycle Benefit/Cost Ratio	**12.0**	**25.3**

9. Design Exhibits

The design concepts for both alternatives were provided to the Caltrans Design group for review and comment. The project team is actively working on obtaining concurrence of the concepts as part of the PSR-PR approval.

10. Conclusions

10.1 Project Alternatives

10.1.1 Rutherford Road Intersection

Due to right of way constraints, construction of a roundabout at the subject intersection is not viable.

At the Rutherford Road intersection, a traffic signal alternative along with active transportation improvements (including bicyclist and pedestrian facilities that make it safer for pedestrian and bicyclist movements at the intersection) and traffic calming measures along the mainline are a viable option. Limits of improvements on Route 29 would extend approximately 0.5 miles north and south from the center of the Rutherford Road intersection, and approximately 500 feet east along Rutherford Road.

Due to the proximity to the Napa Valley Wine Train tracks, railroad crossing improvements will be needed, but there will be no impacts to the Napa Valley Wine Train tracks.

10.1.2 Oakville Cross Road Intersection

At the Oakville Cross Road intersection, both a signal and a roundabout are viable options. Although both alternatives result in increased queues along the mainline, they offer significant safety benefits and improve operations for side street approaches. However, the roundabout alternative results in shorter delays and queue lengths than the signal alternative in all scenarios. Additionally, the roundabout provides a location where vehicles, including rucks, could safely make U-turns.

Due to the proximity to the Napa Valley Wine Train tracks, railroad crossing improvements will be needed, but there will be no impacts to the Napa Valley Wine Train tracks.

Technical Appendices

Appendix Index

Appendix A: Traffic Counts

Appendix B: Synchro Reports

Appendix C: SimTraffic Queue Reports

Appendix D: Sidra LOS Reports

Appendix E: Signal Warrant Worksheets

Appendix F: 2025 and 2035 Traffic Forecasts Memorandum

Appendix G: TASAS Data

Appendix H: Alternative Exhibits

Appendix I: Cost Estimates

Appendix J: Emissions Reports

Appendix K: ICE Calculations

Appendix L: Kimley Horn Study

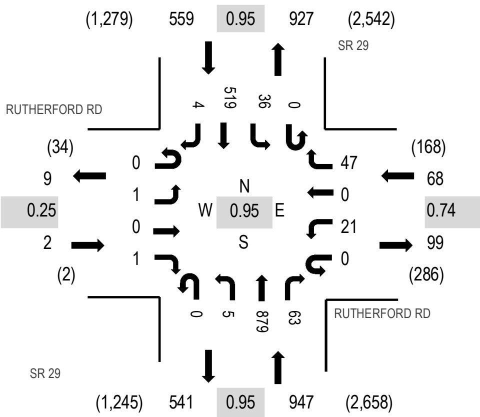
Appendix A – Traffic Counts

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 SR 29 & RUTHERFORD RD AM
Date: Thursday, May 5, 2022
Study Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes in Study Peak Hour: 08:15 AM - 08:30 AM

Study Peak Hour (for all study intersections)

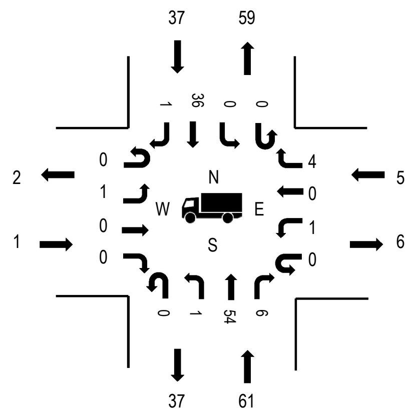
Motorized Vehicles



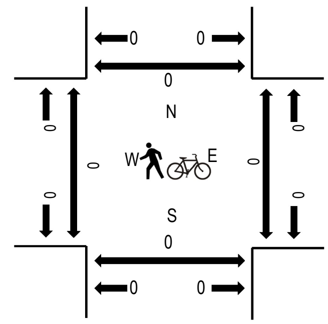
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	50.0%	0.25
WB	7.4%	0.74
NB	6.4%	0.95
SB	6.6%	0.95
All	6.6%	0.95

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	RUTHERFORD RD Eastbound U-Turn	Left	Thru	Right	RUTHERFORD RD Westbound U-Turn	Left	Thru	Right	SR 29 Northbound U-Turn	Left	Thru	Right	SR 29 Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
6:00 AM	0	0	0	0	0	6	0	6	0	0	174	27	0	0	78	0	291	1,181
6:15 AM	0	0	0	0	0	6	0	6	0	0	160	20	0	5	66	0	263	1,200
6:30 AM	0	0	0	0	0	4	0	8	1	1	208	20	0	4	83	1	330	1,248
6:45 AM	0	0	0	0	0	0	1	9	0	5	174	25	0	6	74	3	297	1,288
7:00 AM	0	0	0	0	0	5	0	5	0	2	197	10	0	5	85	1	310	1,350
7:15 AM	0	0	0	0	0	6	0	13	0	3	194	13	0	9	70	3	311	1,390
7:30 AM	0	0	0	0	0	6	0	8	0	1	215	16	0	8	116	0	370	1,492
7:45 AM	0	0	0	0	0	2	0	9	0	0	229	16	0	3	96	4	359	1,525
8:00 AM	0	0	0	0	0	5	0	12	0	2	195	8	0	3	124	1	350	1,576
8:15 AM	0	0	0	0	0	5	0	18	0	2	225	19	0	11	132	1	413	
8:30 AM	0	0	0	0	0	3	0	7	0	0	233	13	0	11	136	0	403	
8:45 AM	0	1	0	1	0	8	0	10	0	1	226	23	0	11	127	2	410	
Count Total	0	1	0	1	0	56	1	111	1	17	2,430	210	0	76	1,187	16	4,107	
Peak Hour	0	1	0	1	0	21	0	47	0	5	879	63	0	36	519	4	1,576	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
6:00 AM	0	10	0	1	11	6:00 AM	0	0	0	0	0	6:00 AM	0	0	0	0	0
6:15 AM	0	11	0	3	14	6:15 AM	0	0	0	0	0	6:15 AM	0	0	0	0	0
6:30 AM	0	10	0	4	14	6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0
6:45 AM	0	12	1	4	17	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
7:00 AM	0	9	1	8	18	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:15 AM	0	10	3	6	19	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:30 AM	0	6	2	13	21	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:45 AM	0	5	3	13	21	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
8:00 AM	0	13	2	13	28	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0

8:15 AM	0	14	0	10	24	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:30 AM	0	16	0	6	22	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:45 AM	1	18	3	8	30	8:45 AM	0	1	0	0	1	8:45 AM	0	0	0	0	0
Count Total	1	134	15	89	239	Count Total	0	1	0	0	1	Count Total	0	0	0	0	0
Peak Hour	1	61	5	37	104	Peak Hour	0	1	0	0	1	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES

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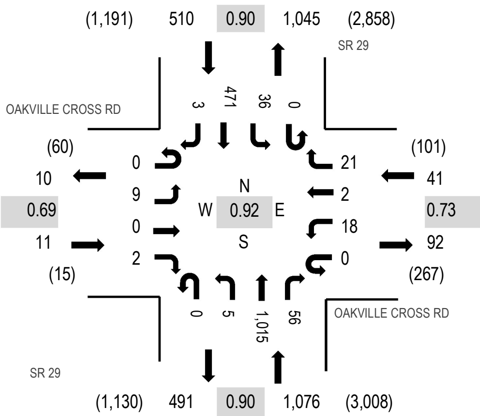
Peak 15-Minutes in Study Peak Hour: 08:15 AM - 08:30 AM

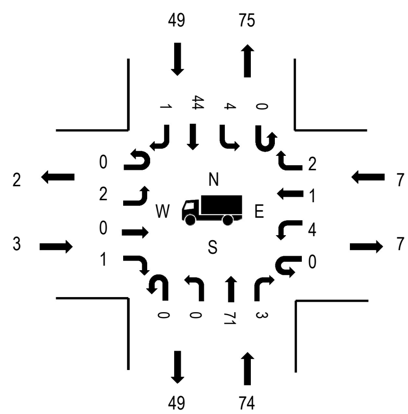
Study Peak Hour (for all study intersections)

Motorized Vehicles

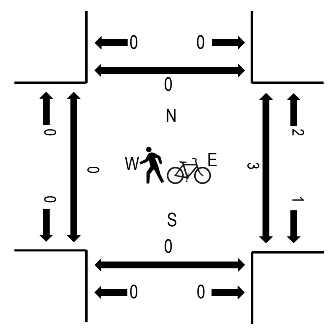


Note: Total study counts contained in parentheses.

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	27.3%	0.69
WB	17.1%	0.73
NB	6.9%	0.90
SB	9.6%	0.90
All	8.1%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	OAKVILLE CROSS RD Eastbound U-Turn	Left	Thru	Right	OAKVILLE CROSS RD Westbound U-Turn	Left	Thru	Right	SR 29 Northbound U-Turn	Left	Thru	Right	SR 29 Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
6:00 AM	0	1	0	0	0	0	0	1	0	7	210	40	0	4	67	2	332	1,305
6:15 AM	0	0	0	0	0	1	0	6	0	0	205	12	0	3	68	3	298	1,270
6:30 AM	0	0	0	0	0	2	2	5	0	6	247	15	0	7	77	2	363	1,293
6:45 AM	0	0	0	0	0	2	0	6	0	3	218	16	0	3	55	9	312	1,285
7:00 AM	0	0	0	0	0	5	4	4	0	1	183	12	0	3	82	3	297	1,372
7:15 AM	0	1	0	1	0	2	0	3	0	2	218	8	0	6	78	2	321	1,426
7:30 AM	0	0	0	1	0	2	0	6	0	0	227	13	0	4	101	1	355	1,550
7:45 AM	0	0	0	0	0	3	0	6	0	2	266	21	0	8	92	1	399	1,629
8:00 AM	0	4	0	0	0	4	1	9	0	2	209	12	0	7	103	0	351	1,638
8:15 AM	0	1	0	1	0	3	1	4	0	1	280	17	0	15	121	1	445	
8:30 AM	0	2	0	0	0	6	0	3	0	1	265	15	0	8	132	2	434	
8:45 AM	0	2	0	1	0	5	0	5	0	1	261	12	0	6	115	0	408	
Count Total	0	11	0	4	0	35	8	58	0	26	2,789	193	0	74	1,091	26	4,315	
Peak Hour	0	9	0	2	0	18	2	21	0	5	1,015	56	0	36	471	3	1,638	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
6:00 AM	0	8	0	1	9	6:00 AM	0	0	0	0	0	6:00 AM	0	0	1	0	1
6:15 AM	0	12	0	5	17	6:15 AM	0	1	0	0	1	6:15 AM	0	0	0	1	1
6:30 AM	0	11	2	7	20	6:30 AM	0	1	0	0	1	6:30 AM	0	0	0	0	0
6:45 AM	0	16	0	5	21	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
7:00 AM	0	13	2	6	21	7:00 AM	0	0	0	0	0	7:00 AM	0	0	4	0	4
7:15 AM	1	12	1	8	22	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:30 AM	0	12	0	14	26	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:45 AM	0	6	0	15	21	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
8:00 AM	1	18	3	15	37	8:00 AM	0	0	0	0	0	8:00 AM	0	0	1	0	1

8:15 AM	2	18	0	17	37	8:15 AM	0	0	0	0	0	8:15 AM	0	0	1	0	1
8:30 AM	0	22	2	9	33	8:30 AM	0	1	0	0	1	8:30 AM	0	0	0	0	0
8:45 AM	0	16	2	8	26	8:45 AM	0	0	0	0	0	8:45 AM	0	0	1	0	1
Count Total	4	164	12	110	290	Count Total	0	3	0	0	3	Count Total	0	0	8	1	9
Peak Hour	3	74	7	49	133	Peak Hour	0	1	0	0	1	Peak Hour	0	0	3	0	3

ALL TRAFFIC DATA SERVICES
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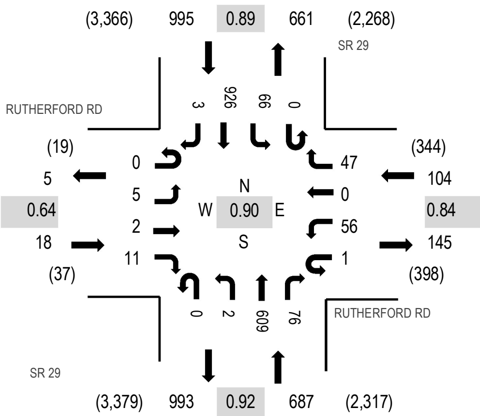
Location: 1 SR 29 & RUTHERFORD RD PM
Date: Thursday, May 5, 2022
Study Peak Hour: 03:30 PM - 04:30 PM
Peak 15-Minutes in Study Peak Hour: 03:30 PM - 03:45 PM

Study Peak Hour (for all study intersections)

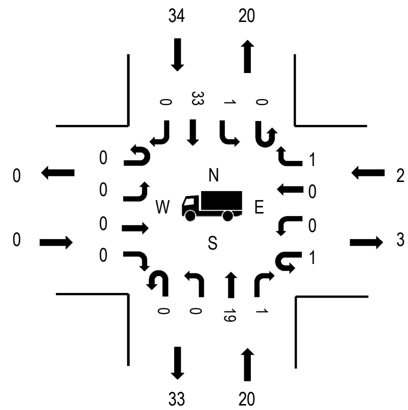
Motorized Vehicles



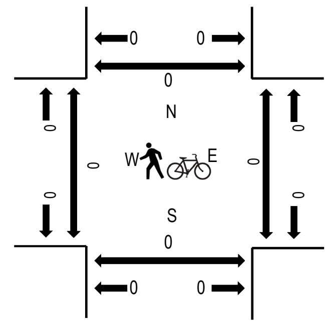
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.64
WB	1.9%	0.84
NB	2.9%	0.92
SB	3.4%	0.89
All	3.1%	0.90

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	RUTHERFORD RD Eastbound U-Turn	Left	Thru	Right	RUTHERFORD RD Westbound U-Turn	Left	Thru	Right	SR 29 Northbound U-Turn	Left	Thru	Right	SR 29 Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
3:00 PM	0	0	1	1	0	12	1	8	0	0	144	21	0	9	222	0	419	1,805
3:15 PM	0	1	0	4	0	12	0	8	0	0	161	17	0	24	202	0	429	1,814
3:30 PM	0	3	0	4	0	21	0	10	0	1	165	20	0	16	263	0	503	1,804
3:45 PM	0	0	1	2	0	11	0	13	0	1	143	23	0	13	246	1	454	1,728
4:00 PM	0	0	1	4	1	12	0	15	0	0	153	16	0	20	204	2	428	1,670
4:15 PM	0	2	0	1	0	12	0	9	0	0	148	17	0	17	213	0	419	1,659
4:30 PM	0	0	0	2	0	17	0	12	0	0	148	10	0	20	218	0	427	1,627
4:45 PM	0	0	0	0	0	6	0	14	0	1	126	5	0	14	230	0	396	1,584
5:00 PM	0	0	0	1	0	18	0	9	0	1	135	7	0	19	227	0	417	1,533
5:15 PM	0	0	0	1	0	18	0	8	0	3	122	7	0	14	214	0	387	1,419
5:30 PM	0	0	0	0	0	14	0	14	0	2	138	7	0	12	197	0	384	1,288
5:45 PM	0	0	0	0	0	10	0	8	0	1	127	13	0	9	175	2	345	1,165
6:00 PM	0	0	1	0	0	10	0	2	0	1	100	7	0	9	173	0	303	1,056
6:15 PM	0	0	0	2	0	12	0	6	0	0	104	5	0	1	125	1	256	
6:30 PM	0	0	2	1	0	8	0	6	0	1	106	7	0	3	127	0	261	
6:45 PM	0	0	0	2	0	4	0	3	0	0	97	6	0	3	121	0	236	
Count Total	0	6	6	25	1	197	1	145	0	12	2,117	188	0	203	3,157	6	6,064	
Peak Hour	0	5	2	11	1	56	0	47	0	2	609	76	0	66	926	3	1,804	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
3:00 PM	0	6	1	4	11	3:00 PM	0	1	0	0	1	3:00 PM	0	0	0	0	0
3:15 PM	0	6	0	8	14	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:30 PM	0	3	1	7	11	3:30 PM	0	0	0	0	0	3:30 PM	0	0	0	0	0
3:45 PM	0	3	0	9	12	3:45 PM	0	1	0	0	1	3:45 PM	0	0	0	0	0
4:00 PM	0	7	1	10	18	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0

4:15 PM	0	7	0	8	15	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	0	5	2	3	10	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	2	0	7	9	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	1	1	1	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	3	1	1	5	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	1	0	6	7	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	4	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
6:00 PM	0	2	0	8	10	6:00 PM	0	0	0	0	0	6:00 PM	0	0	0	0	0
6:15 PM	0	2	0	3	5	6:15 PM	0	0	0	0	0	6:15 PM	0	0	0	1	1
6:30 PM	0	1	0	1	2	6:30 PM	0	0	0	0	0	6:30 PM	0	0	0	0	0
6:45 PM	0	2	0	1	3	6:45 PM	0	0	0	0	0	6:45 PM	0	0	0	0	0
Count Total	0	51	7	81	139	Count Total	0	2	0	0	2	Count Total	0	0	0	1	1
Peak Hour	0	20	2	34	56	Peak Hour	0	1	0	0	1	Peak Hour	0	0	0	0	0

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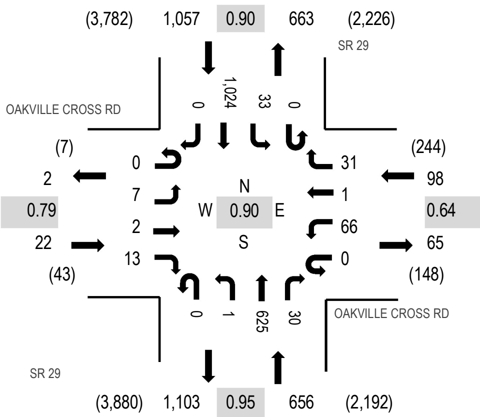
Peak 15-Minutes in Study Peak Hour: 03:30 PM - 03:45 PM

Study Peak Hour (for all study intersections)

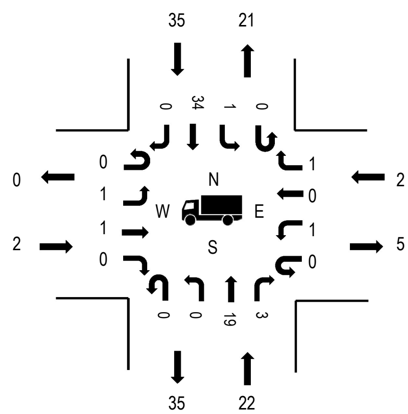
Motorized Vehicles



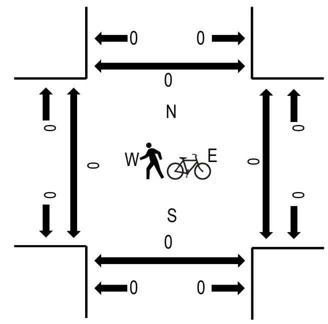
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	9.1%	0.79
WB	2.0%	0.64
NB	3.4%	0.95
SB	3.3%	0.90
All	3.3%	0.90

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	OAKVILLE CROSS RD Eastbound U-Turn	Left	Thru	Right	OAKVILLE CROSS RD Westbound U-Turn	Left	Thru	Right	SR 29 Northbound U-Turn	Left	Thru	Right	SR 29 Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
3:00 PM	0	1	2	5	0	13	0	10	0	1	145	6	0	12	255	0	450	1,802
3:15 PM	0	2	0	2	0	3	0	10	0	1	187	4	0	5	200	2	416	1,794
3:30 PM	0	2	1	4	0	27	0	11	0	1	160	8	0	9	286	0	509	1,833
3:45 PM	0	0	1	6	0	12	0	5	0	0	142	8	0	6	247	0	427	1,759
4:00 PM	0	3	0	3	0	14	1	11	0	0	159	5	0	11	235	0	442	1,728
4:15 PM	0	2	0	0	0	13	0	4	0	0	164	9	0	7	256	0	455	1,705
4:30 PM	0	1	1	0	0	11	0	5	0	0	138	4	0	4	271	0	435	1,647
4:45 PM	0	0	0	0	0	6	0	7	0	0	114	1	0	4	264	0	396	1,651
5:00 PM	0	0	0	1	0	15	0	2	0	0	126	4	0	5	266	0	419	1,643
5:15 PM	0	0	1	0	0	10	0	2	0	0	123	2	0	1	258	0	397	1,549
5:30 PM	0	0	0	0	0	19	0	7	0	0	128	3	0	6	275	1	439	1,394
5:45 PM	0	0	0	0	0	5	0	4	0	0	125	1	0	2	251	0	388	1,226
6:00 PM	0	2	0	0	0	5	0	3	0	0	107	0	0	4	204	0	325	1,088
6:15 PM	0	0	0	2	0	0	0	1	0	0	88	2	0	4	145	0	242	
6:30 PM	0	0	0	1	0	2	0	2	0	0	115	3	0	1	147	0	271	
6:45 PM	0	0	0	0	0	3	0	1	0	0	107	1	0	0	138	0	250	
Count Total	0	13	6	24	0	158	1	85	0	3	2,128	61	0	81	3,698	3	6,261	
Peak Hour	0	7	2	13	0	66	1	31	0	1	625	30	0	33	1,024	0	1,833	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
3:00 PM	0	7	0	6	13	3:00 PM	0	2	0	2	4	3:00 PM	0	0	0	0	0
3:15 PM	0	9	1	8	18	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:30 PM	0	5	0	8	13	3:30 PM	0	0	1	1	2	3:30 PM	0	0	0	0	0
3:45 PM	1	3	1	5	10	3:45 PM	0	0	0	3	3	3:45 PM	0	0	0	0	0
4:00 PM	1	8	0	11	20	4:00 PM	0	0	0	2	2	4:00 PM	0	0	0	0	0

4:15 PM	0	6	1	11	18	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	0	5	1	10	16	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	2	0	6	8	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	1	1	4	6	5:00 PM	1	1	0	0	2	5:00 PM	0	0	0	0	0
5:15 PM	0	4	0	5	9	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	2	1	5	8	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	5	5	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
6:00 PM	0	2	0	8	10	6:00 PM	0	0	0	0	0	6:00 PM	0	0	0	0	0
6:15 PM	0	2	0	2	4	6:15 PM	0	0	0	0	0	6:15 PM	0	0	0	0	0
6:30 PM	0	4	0	3	7	6:30 PM	0	0	0	0	0	6:30 PM	0	0	0	0	0
6:45 PM	0	1	0	3	4	6:45 PM	0	0	0	0	0	6:45 PM	0	0	0	0	0
Count Total	2	61	6	100	169	Count Total	1	3	1	8	13	Count Total	0	0	0	0	0
Peak Hour	2	22	2	35	61	Peak Hour	0	0	1	6	7	Peak Hour	0	0	0	0	0

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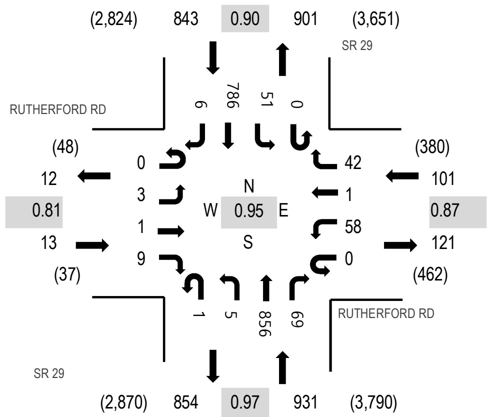
Location: 1 SR 29 & RUTHERFORD RD Noon
Date: Saturday, May 7, 2022
Study Peak Hour: 01:45 PM - 02:45 PM
Peak 15-Minutes in Study Peak Hour: 02:00 PM - 02:15 PM

Study Peak Hour (for all study intersections)

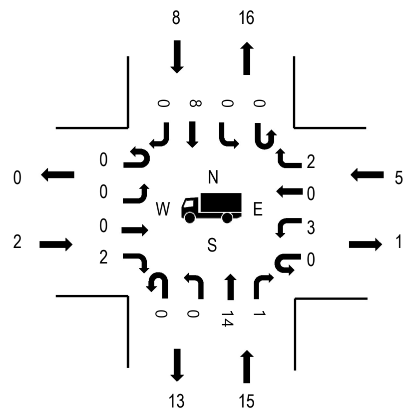
Motorized Vehicles



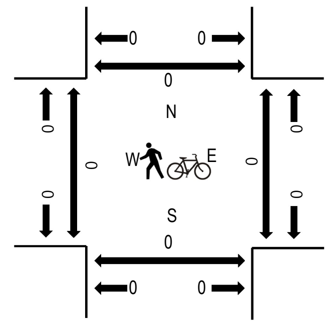
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	15.4%	0.81
WB	5.0%	0.87
NB	1.6%	0.97
SB	0.9%	0.90
All	1.6%	0.95

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	RUTHERFORD RD Eastbound U-Turn	Left	Thru	Right	RUTHERFORD RD Westbound U-Turn	Left	Thru	Right	SR 29 Northbound U-Turn	Left	Thru	Right	SR 29 Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
11:00 AM	0	0	0	2	0	14	1	8	0	1	236	15	0	4	119	3	403	1,641
11:15 AM	0	0	0	2	0	11	1	10	0	0	239	23	0	7	111	0	404	1,678
11:30 AM	0	0	0	0	0	13	0	4	0	0	217	18	0	6	140	0	398	1,670
11:45 AM	0	2	0	0	0	5	0	14	0	3	228	19	0	10	155	0	436	1,715
12:00 PM	0	0	0	0	0	10	0	11	0	2	235	20	0	14	146	2	440	1,701
12:15 PM	0	1	0	2	0	8	0	13	0	2	205	17	0	10	134	4	396	1,707
12:30 PM	0	2	0	0	0	7	0	10	0	1	238	19	0	13	153	0	443	1,783
12:45 PM	0	1	0	0	0	22	1	8	0	0	185	14	0	14	177	0	422	1,801
1:00 PM	0	3	0	4	0	11	0	9	0	2	213	27	0	13	163	1	446	1,812
1:15 PM	0	0	0	1	0	14	0	14	0	3	235	15	0	11	179	0	472	1,862
1:30 PM	0	1	0	0	0	19	0	13	0	3	206	17	0	5	196	1	461	1,883
1:45 PM	0	1	1	2	0	10	0	7	1	2	216	13	0	16	163	1	433	1,888
2:00 PM	0	1	0	3	0	18	0	11	0	2	225	14	0	12	209	1	496	1,877
2:15 PM	0	0	0	4	0	14	0	12	0	1	205	23	0	13	217	4	493	
2:30 PM	0	1	0	0	0	16	1	12	0	0	210	19	0	10	197	0	466	
2:45 PM	0	2	0	1	0	17	1	10	0	2	177	22	0	8	180	2	422	
Count Total	0	15	1	21	0	209	5	166	1	24	3,470	295	0	166	2,639	19	7,031	
Peak Hour	0	3	1	9	0	58	1	42	1	5	856	69	0	51	786	6	1,888	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
11:00 AM	0	5	1	6	12	11:00 AM	0	0	2	0	2	11:00 AM	0	0	1	0	1
11:15 AM	0	7	1	2	10	11:15 AM	0	11	0	1	12	11:15 AM	0	0	0	0	0
11:30 AM	0	6	0	3	9	11:30 AM	0	2	0	0	2	11:30 AM	0	0	0	0	0
11:45 AM	0	1	1	1	3	11:45 AM	0	3	0	0	3	11:45 AM	0	0	0	0	0
12:00 PM	0	4	0	1	5	12:00 PM	0	2	1	1	4	12:00 PM	0	0	0	0	0

12:15 PM	1	8	1	6	16	12:15 PM	0	2	2	2	6	12:15 PM	0	0	0	0	0
12:30 PM	0	0	1	2	3	12:30 PM	0	1	0	3	4	12:30 PM	0	0	0	0	0
12:45 PM	0	2	1	4	7	12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0
1:00 PM	2	2	0	1	5	1:00 PM	0	0	0	0	0	1:00 PM	0	0	0	0	0
1:15 PM	0	2	0	3	5	1:15 PM	0	2	0	0	2	1:15 PM	0	0	0	0	0
1:30 PM	0	2	0	2	4	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0
1:45 PM	1	4	0	3	8	1:45 PM	0	0	0	6	6	1:45 PM	0	0	0	0	0
2:00 PM	1	4	2	2	9	2:00 PM	0	1	2	0	3	2:00 PM	0	0	0	0	0
2:15 PM	0	4	2	0	6	2:15 PM	0	0	0	6	6	2:15 PM	0	0	0	0	0
2:30 PM	0	3	1	3	7	2:30 PM	0	2	0	3	5	2:30 PM	0	0	0	0	0
2:45 PM	0	3	0	0	3	2:45 PM	0	2	1	2	5	2:45 PM	0	1	0	0	1
Count Total	5	57	11	39	112	Count Total	0	28	8	24	60	Count Total	0	1	1	0	2
Peak Hour	2	15	5	8	30	Peak Hour	0	3	2	15	20	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
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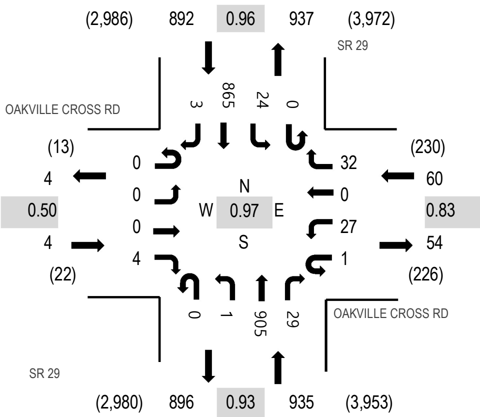
Location: 2 SR 29 & OAKVILLE CROSS RD Noon
Date: Saturday, May 7, 2022
Study Peak Hour: 01:45 PM - 02:45 PM
Peak 15-Minutes in Study Peak Hour: 01:45 PM - 02:00 PM

Study Peak Hour (for all study intersections)

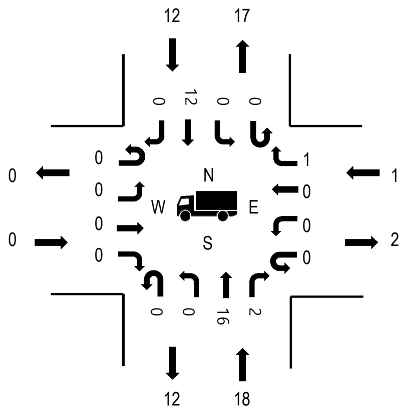
Motorized Vehicles



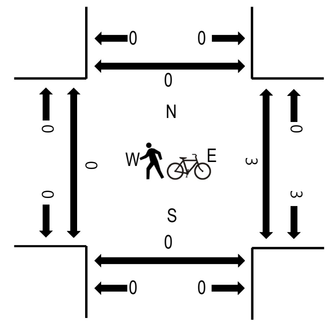
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.50
WB	1.7%	0.83
NB	1.9%	0.93
SB	1.3%	0.96
All	1.6%	0.97

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	OAKVILLE CROSS RD Eastbound U-Turn	Left	Thru	Right	OAKVILLE CROSS RD Westbound U-Turn	Left	Thru	Right	SR 29 Northbound U-Turn	Left	Thru	Right	SR 29 Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
11:00 AM	0	1	0	2	0	0	0	4	0	0	284	7	0	2	143	0	443	1,690
11:15 AM	0	1	0	0	0	5	0	4	0	0	264	7	1	3	117	0	402	1,702
11:30 AM	0	0	0	0	0	2	0	7	0	0	245	7	1	5	154	0	421	1,750
11:45 AM	0	0	0	1	0	2	0	9	0	1	242	7	0	3	158	1	424	1,779
12:00 PM	0	0	0	1	0	12	0	7	0	0	260	5	1	3	164	2	455	1,782
12:15 PM	0	2	0	1	0	7	0	16	0	0	247	9	0	7	160	1	450	1,794
12:30 PM	0	0	0	0	0	3	0	10	0	1	236	10	1	12	177	0	450	1,810
12:45 PM	0	0	0	1	0	10	0	8	0	0	223	9	0	11	164	1	427	1,819
1:00 PM	0	1	0	1	0	4	0	10	0	0	246	10	2	8	184	1	467	1,881
1:15 PM	0	0	0	0	0	7	0	9	0	0	234	9	1	11	195	0	466	1,894
1:30 PM	0	2	1	0	0	8	1	11	0	0	232	7	0	6	191	0	459	1,884
1:45 PM	0	0	0	0	0	7	0	7	0	0	242	10	0	4	219	0	489	1,891
2:00 PM	0	0	0	1	0	6	0	9	0	0	237	4	0	8	214	1	480	1,838
2:15 PM	0	0	0	1	0	7	0	11	0	1	196	8	0	6	224	2	456	
2:30 PM	0	0	0	2	1	7	0	5	0	0	230	7	0	6	208	0	466	
2:45 PM	0	0	0	3	0	7	0	7	0	0	206	10	0	3	200	0	436	
Count Total	0	7	1	14	1	94	1	134	0	3	3,824	126	7	98	2,872	9	7,191	
Peak Hour	0	0	0	4	1	27	0	32	0	1	905	29	0	24	865	3	1,891	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
11:00 AM	0	7	1	6	14	11:00 AM	0	0	0	2	2	11:00 AM	0	0	0	0	0
11:15 AM	0	3	0	4	7	11:15 AM	0	7	2	1	10	11:15 AM	0	0	0	0	0
11:30 AM	0	6	0	2	8	11:30 AM	0	6	2	0	8	11:30 AM	0	0	0	0	0
11:45 AM	0	2	0	2	4	11:45 AM	0	3	1	0	4	11:45 AM	0	0	0	0	0
12:00 PM	0	2	1	0	3	12:00 PM	0	10	1	0	11	12:00 PM	0	0	2	0	2

12:15 PM	0	7	0	7	14	12:15 PM	0	9	0	1	10	12:15 PM	0	0	0	0	0
12:30 PM	0	2	0	3	5	12:30 PM	0	4	0	0	4	12:30 PM	0	0	10	0	10
12:45 PM	0	0	0	3	3	12:45 PM	0	0	2	2	4	12:45 PM	0	0	0	0	0
1:00 PM	0	2	0	4	6	1:00 PM	0	2	0	0	2	1:00 PM	0	0	0	0	0
1:15 PM	0	2	0	4	6	1:15 PM	0	0	0	0	0	1:15 PM	0	0	0	0	0
1:30 PM	0	2	0	3	5	1:30 PM	0	0	2	0	2	1:30 PM	0	0	0	0	0
1:45 PM	0	5	0	3	8	1:45 PM	0	4	1	5	10	1:45 PM	0	0	0	0	0
2:00 PM	0	5	1	4	10	2:00 PM	0	1	3	1	5	2:00 PM	0	0	0	0	0
2:15 PM	0	5	0	2	7	2:15 PM	0	1	0	1	2	2:15 PM	0	0	3	0	3
2:30 PM	0	3	0	3	6	2:30 PM	0	0	1	8	9	2:30 PM	0	0	0	0	0
2:45 PM	0	2	0	0	2	2:45 PM	0	5	0	2	7	2:45 PM	0	0	0	0	0
Count Total	0	55	3	50	108	Count Total	0	52	15	23	90	Count Total	0	0	15	0	15
Peak Hour	0	18	1	12	31	Peak Hour	0	6	5	15	26	Peak Hour	0	0	3	0	3

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Site Code: 4
SR 29 BTW RUTHERFORD & OAKVILLE CROSS

Start	05-May-22		06-May-22		07-May-22		08-May-22		09-May-22		10-May-22		11-May-22		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	34	32	60	44	66	95	79	143	*	*	*	*	*	*	60	78
01:00	30	24	42	46	33	45	48	54	*	*	*	*	*	*	38	42
02:00	36	24	32	40	16	23	21	36	*	*	*	*	*	*	26	31
03:00	43	29	41	31	34	29	17	14	*	*	*	*	*	*	34	26
04:00	145	58	122	64	60	32	22	25	*	*	*	*	*	*	87	45
05:00	707	185	714	175	305	77	104	52	*	*	*	*	*	*	458	122
06:00	878	307	829	288	325	155	155	112	*	*	*	*	*	*	547	216
07:00	852	358	852	351	366	249	236	163	*	*	*	*	*	*	576	280
08:00	**1015**	452	895	408	650	348	376	282	*	*	*	*	*	*	734	372
09:00	867	435	**914**	495	782	396	593	418	*	*	*	*	*	*	789	436
10:00	723	531	776	546	**925**	431	699	470	*	*	*	*	*	*	781	494
11:00	733	**608**	807	**613**	903	**477**	**830**	**518**	*	*	*	*	*	*	**818**	**554**
12:00 PM	**711**	702	**742**	694	**864**	603	**833**	639	*	*	*	*	*	*	**788**	660
01:00	687	665	673	721	821	697	733	668	*	*	*	*	*	*	728	688
02:00	630	788	703	800	815	754	721	777	*	*	*	*	*	*	717	780
03:00	577	860	644	**943**	765	**910**	593	812	*	*	*	*	*	*	645	**881**
04:00	429	**887**	464	815	576	875	507	**854**	*	*	*	*	*	*	494	858
05:00	365	852	493	807	459	901	410	792	*	*	*	*	*	*	432	838
06:00	399	619	453	587	364	736	337	689	*	*	*	*	*	*	388	658
07:00	336	367	344	386	309	567	298	469	*	*	*	*	*	*	322	447
08:00	251	299	307	316	273	385	281	332	*	*	*	*	*	*	278	333
09:00	219	235	228	342	251	402	190	257	*	*	*	*	*	*	222	309
10:00	158	168	180	282	240	370	144	202	*	*	*	*	*	*	180	256
11:00	87	135	129	236	151	285	91	154	*	*	*	*	*	*	114	202
Total	10912	9620	11444	10030	10353	9842	8318	8932	0	0	0	0	0	0	10256	9606
Day	20532		21474		20195		17250		0		0		0		19862	
AM Peak	08:00	11:00	09:00	11:00	10:00	11:00	11:00	11:00	-	-	-	-	-	-	11:00	11:00
Vol.	1015	608	914	613	925	477	830	518	-	-	-	-	-	-	818	554
PM Peak	12:00	16:00	12:00	15:00	12:00	15:00	12:00	16:00	-	-	-	-	-	-	12:00	15:00
Vol.	711	887	742	943	864	910	833	854	-	-	-	-	-	-	788	881

Comb. Total	20532	21474	20195	17250	0	0	0	19862

ADT: ADT 19,863 AADT 19,863

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Site Code: 4
SR 29 BTW RUTHERFORD & OAKVILLE CROSS

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/05/22	0	19	10	1	2	0	0	1	1	0	0	0	0	34
01:00	0	18	4	0	7	0	0	1	0	0	0	0	0	30
02:00	0	15	6	1	14	0	0	0	0	0	0	0	0	36
03:00	0	15	11	2	12	1	0	1	1	0	0	0	0	43
04:00	0	76	34	3	28	0	0	1	3	0	0	0	0	145
05:00	2	435	172	3	77	1	0	8	9	0	0	0	0	707
06:00	**3**	475	**222**	6	141	3	0	15	12	0	1	0	0	878
07:00	0	461	176	**24**	**151**	**5**	0	**26**	9	0	0	0	0	852
08:00	2	**639**	190	15	129	3	0	23	14	0	0	0	0	**1015**
09:00	3	501	169	13	137	5	0	21	**15**	**1**	**2**	0	0	867
10:00	3	403	166	21	109	4	**1**	6	10	0	0	0	0	723
11:00	3	450	155	16	79	5	0	10	14	0	1	0	0	733
12 PM	2	**449**	140	**11**	**85**	6	0	10	7	0	1	0	0	**711**
13:00	5	434	**142**	5	68	**7**	0	**13**	**11**	0	**2**	0	0	687
14:00	4	429	119	9	56	1	0	8	4	0	0	0	0	630
15:00	6	393	119	7	45	1	0	3	3	0	0	0	0	577
16:00	**25**	290	69	11	28	0	0	3	3	0	0	0	0	429
17:00	15	262	58	3	23	3	0	0	1	0	0	0	0	365
18:00	2	275	86	5	28	0	0	2	1	0	0	0	0	399
19:00	1	222	68	1	37	0	0	4	2	0	1	0	0	336
20:00	0	166	61	1	22	0	0	1	0	0	0	0	0	251
21:00	0	147	53	1	13	0	0	2	3	0	0	0	0	219
22:00	0	112	27	1	14	0	0	4	0	0	0	0	0	158
23:00	0	62	19	0	1	1	0	3	1	0	0	0	0	87
Day Total	76	6748	2276	160	1306	46	1	166	124	1	8	0	0	10912
Percent	0.7%	61.8%	20.9%	1.5%	12.0%	0.4%	0.0%	1.5%	1.1%	0.0%	0.1%	0.0%	0.0%	
AM Peak	06:00	08:00	06:00	07:00	07:00	07:00	10:00	07:00	09:00	09:00	09:00			08:00
Vol.	3	639	222	24	151	5	1	26	15	1	2			1015
PM Peak	16:00	12:00	13:00	12:00	12:00	13:00		13:00	13:00		13:00			12:00
Vol.	25	449	142	11	85	7		13	11		2			711

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Site Code: 4
SR 29 BTW RUTHERFORD & OAKVILLE CROSS

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/06/22	0	32	17	2	6	0	0	2	1	0	0	0	0	60
01:00	0	21	13	0	6	0	0	1	1	0	0	0	0	42
02:00	0	14	12	1	4	0	0	1	0	0	0	0	0	32
03:00	0	20	6	0	10	1	0	4	0	0	0	0	0	41
04:00	2	64	32	2	15	0	0	4	2	0	**1**	0	0	122
05:00	2	445	166	6	75	2	**2**	11	5	0	0	0	0	714
06:00	4	439	**223**	8	130	3	0	15	7	0	0	0	0	829
07:00	3	501	156	14	**139**	4	0	**20**	**15**	0	0	0	0	852
08:00	**7**	**578**	162	15	97	**7**	0	19	9	0	0	**1**	0	895
09:00	5	561	175	**17**	117	6	1	16	15	0	1	0	0	**914**
10:00	3	471	160	14	102	4	0	15	7	0	0	0	0	776
11:00	5	517	167	13	78	6	0	12	8	0	1	0	0	807
12 PM	1	**489**	132	13	**83**	**8**	0	9	**6**	0	**1**	0	0	**742**
13:00	2	443	131	**15**	61	4	0	**12**	5	0	0	0	0	673
14:00	4	469	**143**	10	61	5	**1**	8	1	0	1	0	0	703
15:00	5	461	108	8	53	2	0	3	4	0	0	0	0	644
16:00	5	330	82	8	35	1	0	1	2	0	0	0	0	464
17:00	**10**	360	82	4	34	0	0	1	2	0	0	0	0	493
18:00	3	318	87	10	31	1	0	3	0	0	0	0	0	453
19:00	1	240	74	2	25	0	0	1	1	0	0	0	0	344
20:00	0	213	75	0	13	0	0	5	1	0	0	0	0	307
21:00	0	179	33	1	12	0	0	2	1	0	0	0	0	228
22:00	2	130	36	0	10	0	0	0	2	0	0	0	0	180
23:00	0	89	23	2	14	0	0	0	1	0	0	0	0	129
Day Total	64	7384	2295	165	1211	54	4	165	96	0	5	1	0	11444
Percent	0.6%	64.5%	20.1%	1.4%	10.6%	0.5%	0.0%	1.4%	0.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	06:00	09:00	07:00	08:00	05:00	07:00	07:00		04:00	08:00		09:00
Vol.	7	578	223	17	139	7	2	20	15		1	1		914
PM Peak	17:00	12:00	14:00	13:00	12:00	12:00	14:00	13:00	12:00		12:00			12:00
Vol.	10	489	143	15	83	8	1	12	6		1			742

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NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/07/22	0	42	13	0	10	0	0	0	1	0	0	0	0	66
01:00	0	20	9	0	3	0	0	1	0	0	0	0	0	33
02:00	0	10	5	0	1	0	0	0	0	0	0	0	0	16
03:00	0	18	5	1	8	0	0	1	1	0	0	0	0	34
04:00	0	33	10	1	10	0	0	3	**3**	0	0	0	0	60
05:00	1	175	82	1	41	0	0	4	1	0	0	0	0	305
06:00	0	178	84	4	47	0	0	**9**	3	0	0	0	0	325
07:00	1	189	98	4	64	**1**	0	7	1	**1**	0	0	0	366
08:00	4	441	111	**11**	**72**	0	0	9	2	0	0	0	0	650
09:00	3	550	149	11	61	0	0	5	3	0	0	0	0	782
10:00	**7**	**676**	**161**	7	70	1	0	2	1	0	0	0	0	**925**
11:00	6	665	161	8	54	0	0	6	3	0	0	0	0	903
12 PM	4	**646**	**150**	8	**52**	**2**	0	0	**2**	0	0	0	0	**864**
13:00	4	628	140	6	40	0	0	2	1	0	0	0	0	821
14:00	3	626	128	6	47	2	0	2	1	0	0	0	0	815
15:00	**5**	563	145	5	40	0	**1**	**4**	2	0	0	0	0	765
16:00	3	423	106	**9**	31	0	0	3	1	0	0	0	0	576
17:00	0	338	79	8	32	1	0	1	0	0	0	0	0	459
18:00	3	264	64	3	27	1	0	2	0	0	0	0	0	364
19:00	3	216	67	1	22	0	0	0	0	0	0	0	0	309
20:00	2	202	51	1	17	0	0	0	0	0	0	0	0	273
21:00	0	182	53	0	15	1	0	0	0	0	0	0	0	251
22:00	0	171	49	0	17	0	0	3	0	0	0	0	0	240
23:00	0	111	24	0	16	0	0	0	0	0	0	0	0	151
Day Total	49	7367	1944	95	797	9	1	64	26	1	0	0	0	10353
Percent	0.5%	71.2%	18.8%	0.9%	7.7%	0.1%	0.0%	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	10:00	08:00	08:00	07:00		06:00	04:00	07:00				10:00
Vol.	7	676	161	11	72	1		9	3	1				925
PM Peak	15:00	12:00	12:00	16:00	12:00	12:00	15:00	15:00	12:00					12:00
Vol.	5	646	150	9	52	2	1	4	2					864

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NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/08/22	1	51	15	2	9	0	0	1	0	0	0	0	0	79
01:00	0	36	7	0	5	0	0	0	0	0	0	0	0	48
02:00	0	14	4	1	1	0	0	1	0	0	0	0	0	21
03:00	0	11	4	0	1	0	0	0	**1**	0	0	0	0	17
04:00	0	12	8	0	2	0	0	0	0	0	0	0	0	22
05:00	0	66	26	0	12	0	0	0	0	0	0	0	0	104
06:00	0	109	34	0	11	0	0	1	0	0	0	0	0	155
07:00	0	132	66	**7**	30	0	0	0	1	0	0	0	0	236
08:00	2	279	57	6	30	0	0	2	0	0	0	0	0	376
09:00	4	446	96	0	42	0	0	**5**	0	0	0	0	0	593
10:00	0	519	125	3	**49**	1	0	2	0	0	0	0	0	699
11:00	**9**	**621**	**142**	7	47	**2**	0	1	1	0	0	0	0	**830**
12 PM	4	**612**	**162**	**5**	**47**	0	0	3	0	0	0	0	0	**833**
13:00	**7**	561	118	3	41	0	0	3	0	0	0	0	0	733
14:00	4	531	142	4	38	0	**1**	1	0	0	0	0	0	721
15:00	4	449	101	2	33	0	0	**4**	0	0	0	0	0	593
16:00	3	373	101	0	26	**1**	0	2	**1**	0	0	0	0	507
17:00	2	294	89	2	21	0	0	1	1	0	0	0	0	410
18:00	1	237	72	1	23	1	0	1	1	0	0	0	0	337
19:00	0	215	56	1	22	1	0	3	0	0	0	0	0	298
20:00	2	193	62	1	23	0	0	0	0	0	0	0	0	281
21:00	2	140	32	1	14	0	0	1	0	0	0	0	0	190
22:00	1	97	35	0	11	0	0	0	0	0	0	0	0	144
23:00	2	60	20	0	9	0	0	0	0	0	0	0	0	91
Day Total	48	6058	1574	46	547	6	1	32	6	0	0	0	0	8318
Percent	0.6%	72.8%	18.9%	0.6%	6.6%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	07:00	10:00	11:00		09:00	03:00					11:00
Vol.	9	621	142	7	49	2		5	1					830
PM Peak	13:00	12:00	12:00	12:00	12:00	16:00	14:00	15:00	16:00					12:00
Vol.	7	612	162	5	47	1	1	4	1					833
Grand Total	237	27557	8089	466	3861	115	7	427	252	2	13	1	0	41027
Percent	0.6%	67.2%	19.7%	1.1%	9.4%	0.3%	0.0%	1.0%	0.6%	0.0%	0.0%	0.0%	0.0%	

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/05/22	0	24	6	0	1	0	0	0	1	0	0	0	0	32
01:00	0	13	4	0	5	0	0	1	1	0	0	0	0	24
02:00	0	15	5	0	3	0	0	0	1	0	0	0	0	24
03:00	0	16	8	0	3	0	0	1	0	0	1	0	0	29
04:00	0	29	18	0	6	2	0	0	3	0	0	0	0	58
05:00	1	111	43	0	21	1	0	1	7	0	0	0	0	185
06:00	1	197	78	2	20	2	1	4	2	0	0	0	0	307
07:00	0	233	68	3	20	2	1	**10**	**20**	0	1	0	0	358
08:00	1	289	89	6	39	5	**3**	6	14	0	0	0	0	452
09:00	1	284	90	6	31	2	1	6	14	0	0	0	0	435
10:00	1	322	**123**	3	**52**	5	2	7	14	0	**2**	0	0	531
11:00	**2**	**399**	117	**12**	48	**9**	1	7	13	0	0	0	0	**608**
12 PM	6	468	133	6	**54**	9	1	7	**17**	0	**1**	0	0	702
13:00	2	465	121	8	42	5	2	9	10	**1**	0	0	0	665
14:00	7	534	157	**11**	54	8	1	8	7	0	1	0	0	788
15:00	4	588	**192**	5	43	10	1	**13**	4	0	0	0	0	860
16:00	**15**	**678**	129	6	28	**16**	4	10	1	0	0	0	0	**887**
17:00	15	674	114	1	23	9	**7**	8	1	0	0	0	0	852
18:00	5	487	91	0	30	1	0	2	3	0	0	0	0	619
19:00	0	297	57	2	10	0	0	1	0	0	0	0	0	367
20:00	1	244	33	4	15	0	0	0	2	0	0	0	0	299
21:00	1	185	35	1	11	0	0	0	2	0	0	0	0	235
22:00	1	134	20	2	9	0	0	1	0	0	1	0	0	168
23:00	0	116	12	4	1	1	0	0	1	0	0	0	0	135
Day Total	64	6802	1743	82	569	87	25	102	138	1	7	0	0	9620
Percent	0.7%	70.7%	18.1%	0.9%	5.9%	0.9%	0.3%	1.1%	1.4%	0.0%	0.1%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00	11:00	10:00	11:00	08:00	07:00	07:00		10:00			11:00
Vol.	2	399	123	12	52	9	3	10	20		2			608
PM Peak	16:00	16:00	15:00	14:00	12:00	16:00	17:00	15:00	12:00	13:00	12:00			16:00
Vol.	15	678	192	11	54	16	7	13	17	1	1			887

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/06/22	0	33	3	1	0	6	0	0	1	0	0	0	0	44
01:00	0	29	6	1	2	4	0	0	4	0	0	0	0	46
02:00	0	28	6	0	5	1	0	0	0	0	0	0	0	40
03:00	0	17	7	1	3	2	0	0	1	0	0	0	0	31
04:00	1	35	17	0	8	2	0	0	1	0	0	0	0	64
05:00	1	114	35	1	20	0	0	1	3	0	0	0	0	175
06:00	**2**	182	71	3	24	1	0	4	0	0	**1**	0	0	288
07:00	2	228	69	4	21	**9**	0	10	7	0	1	0	0	351
08:00	0	268	81	7	22	6	2	7	14	0	0	0	**1**	408
09:00	0	323	95	2	44	4	1	**15**	10	0	1	0	0	495
10:00	2	354	109	6	35	5	**3**	15	**15**	0	1	**1**	0	546
11:00	2	**405**	**128**	**8**	**45**	9	0	11	5	0	0	0	0	**613**
12 PM	2	487	123	6	41	**8**	3	**14**	8	0	**2**	0	0	694
13:00	6	515	118	**7**	**48**	2	0	11	**13**	0	1	0	0	721
14:00	7	549	166	6	45	3	3	14	7	0	0	0	0	800
15:00	8	**684**	**189**	6	43	8	0	2	3	0	0	0	0	**943**
16:00	**15**	643	108	6	26	7	**4**	5	1	0	0	0	0	815
17:00	14	658	101	4	22	1	4	2	1	0	0	0	0	807
18:00	7	486	75	2	15	0	0	1	1	0	0	0	0	587
19:00	1	319	46	3	14	0	0	1	2	0	0	0	0	386
20:00	2	259	45	2	5	1	0	1	1	0	0	0	0	316
21:00	1	273	47	3	17	0	0	1	0	0	0	0	0	342
22:00	0	225	42	4	7	1	0	1	2	0	0	0	0	282
23:00	1	198	22	1	11	0	0	0	3	0	0	0	0	236
Day Total	74	7312	1709	84	523	80	20	116	103	0	7	1	1	10030
Percent	0.7%	72.9%	17.0%	0.8%	5.2%	0.8%	0.2%	1.2%	1.0%	0.0%	0.1%	0.0%	0.0%	
AM Peak	06:00	11:00	11:00	11:00	11:00	07:00	10:00	09:00	10:00		06:00	10:00	08:00	11:00
Vol.	2	405	128	8	45	9	3	15	15		1	1	1	613
PM Peak	16:00	15:00	15:00	13:00	13:00	12:00	16:00	12:00	13:00		12:00			15:00
Vol.	15	684	189	7	48	8	4	14	13		2			943

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/07/22	0	76	14	1	3	0	0	0	1	0	0	0	0	95
01:00	0	34	6	0	4	0	0	1	0	0	0	0	0	45
02:00	0	19	3	0	0	0	0	0	1	0	0	0	0	23
03:00	0	22	2	1	3	0	0	0	1	0	0	0	0	29
04:00	0	19	6	1	2	0	0	1	3	0	0	0	0	32
05:00	0	54	16	1	3	1	0	1	1	0	0	0	0	77
06:00	0	108	33	0	8	**2**	0	2	2	0	0	0	0	155
07:00	0	170	50	1	21	2	0	3	2	0	0	0	0	249
08:00	1	256	60	1	17	2	0	3	**8**	0	0	0	0	348
09:00	5	285	77	2	19	1	0	**5**	2	0	0	0	0	396
10:00	3	317	**81**	**3**	21	0	0	4	2	0	0	0	0	431
11:00	**6**	**366**	76	2	**22**	1	0	4	0	0	0	0	0	**477**
12 PM	6	480	93	2	21	0	0	1	0	0	0	0	0	603
13:00	6	563	96	6	22	**2**	0	0	**2**	0	0	0	0	697
14:00	7	626	83	**8**	**28**	0	0	0	2	0	0	0	0	754
15:00	**10**	742	**127**	2	27	1	0	1	0	0	0	0	0	**910**
16:00	2	737	99	6	28	1	**1**	0	1	0	0	0	0	875
17:00	5	**769**	88	7	28	1	0	**2**	1	0	0	0	0	901
18:00	4	655	58	1	17	1	0	0	0	0	0	0	0	736
19:00	3	471	69	2	20	0	0	2	0	0	0	0	0	567
20:00	5	321	51	0	6	0	0	1	1	0	0	0	0	385
21:00	0	334	57	2	9	0	0	0	0	0	0	0	0	402
22:00	0	324	34	1	10	0	0	0	1	0	0	0	0	370
23:00	1	238	33	5	7	0	0	1	0	0	0	0	0	285
Day Total	64	7986	1312	55	346	15	1	32	31	0	0	0	0	9842
Percent	0.7%	81.1%	13.3%	0.6%	3.5%	0.2%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00	10:00	11:00	06:00		09:00	08:00					11:00
Vol.	6	366	81	3	22	2		5	8					477
PM Peak	15:00	17:00	15:00	14:00	14:00	13:00	16:00	17:00	13:00					15:00
Vol.	10	769	127	8	28	2	1	2	2					910

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Site Code: 4
SR 29 BTW RUTHERFORD & OAKVILLE CROSS

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/08/22	0	116	16	1	9	0	0	1	0	0	0	0	0	143
01:00	0	42	5	**3**	4	0	0	0	0	0	0	0	0	54
02:00	0	25	7	2	1	0	0	1	0	0	0	0	0	36
03:00	0	11	3	0	0	0	0	0	0	0	0	0	0	14
04:00	0	21	2	0	1	0	0	0	**1**	0	0	0	0	25
05:00	1	41	9	0	1	0	0	0	0	0	0	0	0	52
06:00	1	95	13	0	2	0	0	1	0	0	0	0	0	112
07:00	0	130	23	0	9	0	0	1	0	0	0	0	0	163
08:00	**3**	227	40	1	10	0	0	0	1	0	0	0	0	282
09:00	0	344	56	1	**14**	**1**	0	1	1	0	0	0	0	418
10:00	1	390	67	0	10	0	0	**2**	0	0	0	0	0	470
11:00	2	**431**	**70**	2	12	0	0	1	0	0	0	0	0	**518**
12 PM	**6**	528	82	1	20	0	0	**2**	0	0	0	0	0	639
13:00	4	548	90	2	**22**	0	0	2	0	0	0	0	0	668
14:00	6	648	**102**	**4**	15	0	0	2	0	0	0	0	0	777
15:00	3	719	76	2	11	0	0	1	0	0	0	0	0	812
16:00	2	**761**	70	0	18	1	0	1	1	0	0	0	0	**854**
17:00	4	696	74	1	15	1	0	1	0	0	0	0	0	792
18:00	3	607	67	1	9	0	0	0	**2**	0	0	0	0	689
19:00	4	408	43	1	11	0	0	2	0	0	0	0	0	469
20:00	2	281	38	1	8	**2**	0	0	0	0	0	0	0	332
21:00	1	218	35	1	2	0	0	0	0	0	0	0	0	257
22:00	0	176	19	0	7	0	0	0	0	0	0	0	0	202
23:00	0	140	13	0	1	0	0	0	0	0	0	0	0	154
Day Total	43	7603	1020	24	212	5	0	19	6	0	0	0	0	8932
Percent	0.5%	85.1%	11.4%	0.3%	2.4%	0.1%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	01:00	09:00	09:00		10:00	04:00					11:00
Vol.	3	431	70	3	14	1		2	1					518
PM Peak	12:00	16:00	14:00	14:00	13:00	20:00		12:00	18:00					16:00
Vol.	6	761	102	4	22	2		2	2					854
Grand Total	245	29703	5784	245	1650	187	46	269	278	1	14	1	1	38424
Percent	0.6%	77.3%	15.1%	0.6%	4.3%	0.5%	0.1%	0.7%	0.7%	0.0%	0.0%	0.0%	0.0%	

Appendix B –Synchro Reports

Intersection												
Int Delay, s/veh	1.6											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	1	0	1	21	0	47	5	879	63	36	519	4
Future Vol, veh/h	1	0	1	21	0	47	5	879	63	36	519	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	1	0	1	22	0	49	5	925	66	38	546	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1617	1625	548	1593	1594	958	550	0	0	991	0	0
Stage 1	624	624	-	968	968	-	-	-	-	-	-	-
Stage 2	993	1001	-	625	626	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	5.1	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	81	100	527	84	104	417	995	-	-	678	-	-
Stage 1	465	470	-	299	326	-	-	-	-	-	-	-
Stage 2	289	314	-	464	469	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	68	94	527	80	98	417	995	-	-	678	-	-
Mov Cap-2 Maneuver	68	94	-	80	98	-	-	-	-	-	-	-
Stage 1	463	444	-	298	324	-	-	-	-	-	-	-
Stage 2	253	312	-	437	443	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.5	30.7	0	0.7
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	995	-	-	120	80	417	678	-	-
HCM Lane V/C Ratio	0.005	-	-	0.018	0.276	0.119	0.056	-	-
HCM Control Delay (s)	8.6	-	-	35.5	66.4	14.8	10.6	-	-
HCM Lane LOS	A	-	-	E	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	0	2	18	2	21	5	1015	56	36	471	3
Future Vol, veh/h	9	0	2	18	2	21	5	1015	56	36	471	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	10	0	2	20	2	23	5	1103	61	39	512	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1748	1766	514	1706	1706	1103	515	0	0	1164	0	0
Stage 1	592	592	-	1113	1113	-	-	-	-	-	-	-
Stage 2	1156	1174	-	593	593	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	4	4.18	-	-	4.18	-	-
Critical Hdwy Stg 1	6.18	5.58	-	5.4	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	2.5	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.272	-	-	2.272	-	-
Pot Cap-1 Maneuver	65	81	549	70	88	503	1021	-	-	579	-	-
Stage 1	482	485	-	314	277	-	-	-	-	-	-	-
Stage 2	233	259	-	883	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	75	549	66	82	503	1021	-	-	579	-	-
Mov Cap-2 Maneuver	57	75	-	66	82	-	-	-	-	-	-	-
Stage 1	480	453	-	312	276	-	-	-	-	-	-	-
Stage 2	220	258	-	820	452	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	68.9	46.7	0	0.8
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1021	-	-	68	67	503	579	-	-
HCM Lane V/C Ratio	0.005	-	-	0.176	0.324	0.045	0.068	-	-
HCM Control Delay (s)	8.5	-	-	68.9	82.7	12.5	11.7	-	-
HCM Lane LOS	A	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	1.2	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	17.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	68	1	52	2	642	87	68	925	2
Future Vol, veh/h	0	0	10	68	1	52	2	642	87	68	925	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	11	72	1	55	2	683	93	72	984	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1891	1909	985	1869	1864	730	986	0	0	776	0	0
Stage 1	1129	1129	-	734	734	-	-	-	-	-	-	-
Stage 2	762	780	-	1135	1130	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	5.1	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	53	67	298	~ 55	72	528	693	-	-	831	-	-
Stage 1	246	277	-	409	423	-	-	-	-	-	-	-
Stage 2	394	403	-	244	276	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	44	61	298	~ 49	66	528	693	-	-	831	-	-
Mov Cap-2 Maneuver	44	61	-	~ 49	66	-	-	-	-	-	-	-
Stage 1	245	253	-	408	422	-	-	-	-	-	-	-
Stage 2	351	402	-	215	252	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	256.2	0	0.7
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	693	-	-	298	49	528	831	-	-
HCM Lane V/C Ratio	0.003	-	-	0.036	1.498	0.105	0.087	-	-
HCM Control Delay (s)	10.2	-	-	17.5	$ 439.7	12.6	9.7	-	-
HCM Lane LOS	B	-	-	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	7	0.3	0.3	-	-

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

Intersection	
Int Delay, s/veh	14.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	13	65	0	35	1	661	22	35	1023	3
Future Vol, veh/h	5	2	13	65	0	35	1	661	22	35	1023	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	5	2	14	68	0	37	1	696	23	37	1077	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1881	1874	1079	1859	1852	696	1080	0	0	719	0	0
Stage 1	1153	1153	-	698	698	-	-	-	-	-	-	-
Stage 2	728	721	-	1161	1154	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	4	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	5.4	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	2.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	54	71	263	~ 56	73	676	638	-	-	873	-	-
Stage 1	238	270	-	494	439	-	-	-	-	-	-	-
Stage 2	412	429	-	762	269	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	49	68	263	~ 50	70	676	638	-	-	873	-	-
Mov Cap-2 Maneuver	49	68	-	~ 50	70	-	-	-	-	-	-	-
Stage 1	238	259	-	493	438	-	-	-	-	-	-	-
Stage 2	389	428	-	686	258	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	44.9	254.7	0	0.3
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	638	-	-	111	50	676	873	-	-
HCM Lane V/C Ratio	0.002	-	-	0.19	1.368	0.055	0.042	-	-
HCM Control Delay (s)	10.7	-	-	44.9	$ 386.2	10.6	9.3	-	-
HCM Lane LOS	B	-	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	6.3	0.2	0.1	-	-

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

Intersection												
Int Delay, s/veh	12.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	9	58	1	42	6	856	69	51	786	6
Future Vol, veh/h	3	1	9	58	1	42	6	856	69	51	786	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	9	61	1	44	6	901	73	54	827	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1910	1924	830	1893	1891	938	833	0	0	974	0	0
Stage 1	938	938	-	950	950	-	-	-	-	-	-	-
Stage 2	972	986	-	943	941	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	5.1	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	52	67	370	~ 53	70	429	800	-	-	708	-	-
Stage 1	317	343	-	312	339	-	-	-	-	-	-	-
Stage 2	304	326	-	315	342	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	43	62	370	~ 48	64	429	800	-	-	708	-	-
Mov Cap-2 Maneuver	43	62	-	~ 48	64	-	-	-	-	-	-	-
Stage 1	315	317	-	310	337	-	-	-	-	-	-	-
Stage 2	270	324	-	283	316	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.5	219.4	0.1	0.6
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	800	-	-	118	48	429	708	-	-
HCM Lane V/C Ratio	0.008	-	-	0.116	1.294	0.103	0.076	-	-
HCM Control Delay (s)	9.5	-	-	39.5	$ 365.3	14.4	10.5	-	-
HCM Lane LOS	A	-	-	E	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	5.8	0.3	0.2	-	-

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

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	1	28	1	36	0	945	30	30	819	1
Future Vol, veh/h	2	1	1	28	1	36	0	945	30	30	819	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	1	29	1	37	0	974	31	31	844	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1916	1912	845	1882	1881	974	845	0	0	1005	0	0
Stage 1	907	907	-	974	974	-	-	-	-	-	-	-
Stage 2	1009	1005	-	908	907	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	4	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	5.4	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	2.5	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	51	68	363	54	71	557	792	-	-	689	-	-
Stage 1	330	355	-	368	330	-	-	-	-	-	-	-
Stage 2	290	319	-	822	355	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	45	65	363	51	68	557	792	-	-	689	-	-
Mov Cap-2 Maneuver	45	65	-	51	68	-	-	-	-	-	-	-
Stage 1	330	339	-	368	330	-	-	-	-	-	-	-
Stage 2	270	319	-	780	339	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	65.1	72.5	0	0.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	792	-	-	64	51	557	689	-	-
HCM Lane V/C Ratio	-	-	-	0.064	0.586	0.067	0.045	-	-
HCM Control Delay (s)	0	-	-	65.1	147.7	11.9	10.5	-	-
HCM Lane LOS	A	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.3	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	5	25	5	55	10	965	70	40	570	5
Future Vol, veh/h	5	5	5	25	5	55	10	965	70	40	570	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	5	5	5	25	5	55	10	965	70	40	570	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1703	1708	573	1678	1675	1000	575	0	0	1035	0	0
Stage 1	653	653	-	1020	1020	-	-	-	-	-	-	-
Stage 2	1050	1055	-	658	655	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	5.1	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	70	89	510	73	93	399	974	-	-	653	-	-
Stage 1	448	456	-	279	308	-	-	-	-	-	-	-
Stage 2	269	296	-	445	455	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	55	83	510	65	86	399	974	-	-	653	-	-
Mov Cap-2 Maneuver	55	83	-	65	86	-	-	-	-	-	-	-
Stage 1	444	428	-	276	305	-	-	-	-	-	-	-
Stage 2	226	293	-	409	427	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51	43.3	0.1	0.7
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	974	-	-	93	68	399	653	-	-
HCM Lane V/C Ratio	0.01	-	-	0.161	0.441	0.138	0.061	-	-
HCM Control Delay (s)	8.7	-	-	51	94.4	15.5	10.9	-	-
HCM Lane LOS	A	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.7	0.5	0.2	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	5	5	25	5	25	10	1115	65	40	520	5
Future Vol, veh/h	15	5	5	25	5	25	10	1115	65	40	520	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	15	5	5	25	5	25	10	1115	65	40	520	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1786	1803	523	1743	1740	1115	525	0	0	1180	0	0
Stage 1	603	603	-	1135	1135	-	-	-	-	-	-	-
Stage 2	1183	1200	-	608	605	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	4	4.18	-	-	4.18	-	-
Critical Hdwy Stg 1	6.18	5.58	-	5.4	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	2.5	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.272	-	-	2.272	-	-
Pot Cap-1 Maneuver	61	77	542	66	84	498	1012	-	-	571	-	-
Stage 1	476	479	-	306	270	-	-	-	-	-	-	-
Stage 2	225	252	-	880	478	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	52	71	542	58	77	498	1012	-	-	571	-	-
Mov Cap-2 Maneuver	52	71	-	58	77	-	-	-	-	-	-	-
Stage 1	471	445	-	303	267	-	-	-	-	-	-	-
Stage 2	208	249	-	802	445	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	86	68	0.1	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1012	-	-	68	60	498	571	-	-
HCM Lane V/C Ratio	0.01	-	-	0.368	0.5	0.05	0.07	-	-
HCM Control Delay (s)	8.6	-	-	86	114.2	12.6	11.8	-	-
HCM Lane LOS	A	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.4	2	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	19.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	5	15	65	5	55	5	670	85	75	1015	5
Future Vol, veh/h	10	5	15	65	5	55	5	670	85	75	1015	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	10	5	15	65	5	55	5	670	85	75	1015	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1921	1933	1018	1901	1893	713	1020	0	0	755	0	0
Stage 1	1168	1168	-	723	723	-	-	-	-	-	-	-
Stage 2	753	765	-	1178	1170	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	5.1	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	50	65	286	~ 52	69	537	673	-	-	846	-	-
Stage 1	233	265	-	414	428	-	-	-	-	-	-	-
Stage 2	399	409	-	230	265	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	39	59	286	~ 43	62	537	673	-	-	846	-	-
Mov Cap-2 Maneuver	39	59	-	~ 43	62	-	-	-	-	-	-	-
Stage 1	231	241	-	411	425	-	-	-	-	-	-	-
Stage 2	351	406	-	194	241	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	80.4	283.2	0.1	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	673	-	-	76	44	537	846	-	-
HCM Lane V/C Ratio	0.007	-	-	0.395	1.591	0.102	0.089	-	-
HCM Control Delay (s)	10.4	-	-	80.4	$ 495.9	12.5	9.7	-	-
HCM Lane LOS	B	-	-	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	7	0.3	0.3	-	-

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

Intersection	
Int Delay, s/veh	24.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	5	15	75	5	40	5	685	35	40	1125	5
Future Vol, veh/h	10	5	15	75	5	40	5	685	35	40	1125	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	10	5	15	75	5	40	5	685	35	40	1125	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1943	1938	1128	1913	1905	685	1130	0	0	720	0	0
Stage 1	1208	1208	-	695	695	-	-	-	-	-	-	-
Stage 2	735	730	-	1218	1210	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	4	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	5.4	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	2.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	48	65	246	~ 51	68	681	611	-	-	872	-	-
Stage 1	222	254	-	495	441	-	-	-	-	-	-	-
Stage 2	408	425	-	749	253	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	41	61	246	~ 43	64	681	611	-	-	872	-	-
Mov Cap-2 Maneuver	41	61	-	~ 43	64	-	-	-	-	-	-	-
Stage 1	220	242	-	491	437	-	-	-	-	-	-	-
Stage 2	377	422	-	657	241	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	77.5	$ 395.8	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	611	-	-	78	44	681	872	-	-
HCM Lane V/C Ratio	0.008	-	-	0.385	1.818	0.059	0.046	-	-
HCM Control Delay (s)	10.9	-	-	77.5	$ 588.4	10.6	9.3	-	-
HCM Lane LOS	B	-	-	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	8.2	0.2	0.1	-	-

Notes

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

Intersection	
Int Delay, s/veh	25.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	15	70	5	50	10	940	80	60	860	10
Future Vol, veh/h	5	5	15	70	5	50	10	940	80	60	860	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	15	70	5	50	10	940	80	60	860	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2013	2025	865	1995	1990	980	870	0	0	1020	0	0
Stage 1	985	985	-	1000	1000	-	-	-	-	-	-	-
Stage 2	1028	1040	-	995	990	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	5.1	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	44	58	353	~ 45	61	411	775	-	-	680	-	-
Stage 1	299	326	-	293	321	-	-	-	-	-	-	-
Stage 2	283	307	-	295	324	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	33	52	353	~ 37	55	411	775	-	-	680	-	-
Mov Cap-2 Maneuver	33	52	-	~ 37	55	-	-	-	-	-	-	-
Stage 1	295	297	-	289	317	-	-	-	-	-	-	-
Stage 2	241	303	-	253	295	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	63.2	$ 415.4	0.1	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	775	-	-	86	38	411	680	-	-
HCM Lane V/C Ratio	0.013	-	-	0.291	1.974	0.122	0.088	-	-
HCM Control Delay (s)	9.7	-	-	63.2	$ 682.3	15	10.8	-	-
HCM Lane LOS	A	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	8.1	0.4	0.3	-	-

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

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	5	35	5	40	5	990	35	30	950	5
Future Vol, veh/h	5	5	5	35	5	40	5	990	35	30	950	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	5	35	5	40	5	990	35	30	950	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2053	2048	953	2018	2015	990	955	0	0	1025	0	0
Stage 1	1013	1013	-	1000	1000	-	-	-	-	-	-	-
Stage 2	1040	1035	-	1018	1015	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	4	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	5.4	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	2.5	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	41	56	314	43	59	551	720	-	-	677	-	-
Stage 1	288	316	-	358	321	-	-	-	-	-	-	-
Stage 2	278	309	-	797	316	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	34	53	314	38	56	551	720	-	-	677	-	-
Mov Cap-2 Maneuver	34	53	-	38	56	-	-	-	-	-	-	-
Stage 1	286	302	-	355	319	-	-	-	-	-	-	-
Stage 2	252	307	-	737	302	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	87.5	154.1	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	720	-	-	58	40	551	677	-	-
HCM Lane V/C Ratio	0.007	-	-	0.259	1	0.073	0.044	-	-
HCM Control Delay (s)	10	-	-	87.5	296.2	12	10.6	-	-
HCM Lane LOS	B	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	3.9	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	5	30	5	65	10	1070	80	45	630	10
Future Vol, veh/h	5	5	5	30	5	65	10	1070	80	45	630	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	5	5	5	30	5	65	10	1070	80	45	630	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1890	1895	635	1860	1860	1110	640	0	0	1150	0	0
Stage 1	725	725	-	1130	1130	-	-	-	-	-	-	-
Stage 2	1165	1170	-	730	730	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	5.1	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	52	68	470	54	71	357	921	-	-	590	-	-
Stage 1	409	423	-	242	273	-	-	-	-	-	-	-
Stage 2	231	261	-	406	420	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	37	62	470	47	65	357	921	-	-	590	-	-
Mov Cap-2 Maneuver	37	62	-	47	65	-	-	-	-	-	-	-
Stage 1	405	391	-	239	270	-	-	-	-	-	-	-
Stage 2	183	258	-	366	388	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	74.9	74.5	0.1	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	921	-	-	66	49	357	590	-	-
HCM Lane V/C Ratio	0.011	-	-	0.227	0.714	0.182	0.076	-	-
HCM Control Delay (s)	9	-	-	74.9	180.8	17.3	11.6	-	-
HCM Lane LOS	A	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	2.9	0.7	0.2	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	5	5	25	5	30	10	1230	70	45	575	5
Future Vol, veh/h	15	5	5	25	5	30	10	1230	70	45	575	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	15	5	5	25	5	30	10	1230	70	45	575	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1971	1988	578	1923	1920	1230	580	0	0	1300	0	0
Stage 1	668	668	-	1250	1250	-	-	-	-	-	-	-
Stage 2	1303	1320	-	673	670	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	4	4.18	-	-	4.18	-	-
Critical Hdwy Stg 1	6.18	5.58	-	5.4	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	2.5	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.272	-	-	2.272	-	-
Pot Cap-1 Maneuver	45	59	504	49	65	458	965	-	-	513	-	-
Stage 1	438	447	-	270	238	-	-	-	-	-	-	-
Stage 2	192	220	-	866	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	36	53	504	42	59	458	965	-	-	513	-	-
Mov Cap-2 Maneuver	36	53	-	42	59	-	-	-	-	-	-	-
Stage 1	434	408	-	267	236	-	-	-	-	-	-	-
Stage 2	174	218	-	773	407	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	143.1	101.3	0.1	0.9
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	965	-	-	48	44	458	513	-	-
HCM Lane V/C Ratio	0.01	-	-	0.521	0.682	0.066	0.088	-	-
HCM Control Delay (s)	8.8	-	-	143.1	189.1	13.4	12.7	-	-
HCM Lane LOS	A	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	2.6	0.2	0.3	-	-

Intersection	
Int Delay, s/veh	41.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	5	20	75	5	65	5	740	95	85	1125	5
Future Vol, veh/h	10	5	20	75	5	65	5	740	95	85	1125	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	10	5	20	75	5	65	5	740	95	85	1125	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2131	2143	1128	2108	2098	788	1130	0	0	835	0	0
Stage 1	1298	1298	-	798	798	-	-	-	-	-	-	-
Stage 2	833	845	-	1310	1300	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	5.1	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	35	48	246	~ 37	51	498	611	-	-	790	-	-
Stage 1	197	230	-	377	395	-	-	-	-	-	-	-
Stage 2	360	376	-	194	229	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	25	42	246	~ 28	45	498	611	-	-	790	-	-
Mov Cap-2 Maneuver	25	42	-	~ 28	45	-	-	-	-	-	-	-
Stage 1	195	205	-	374	392	-	-	-	-	-	-	-
Stage 2	306	373	-	155	204	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	135.4	$ 603	0.1	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	611	-	-	58	29	498	790	-	-
HCM Lane V/C Ratio	0.008	-	-	0.603	2.759	0.131	0.108	-	-
HCM Control Delay (s)	10.9	-	-	135.4	$ 1082.2	13.3	10.1	-	-
HCM Lane LOS	B	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	2.5	9.5	0.4	0.4	-	-

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

Intersection	
Int Delay, s/veh	54.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	5	20	90	5	45	5	760	40	40	1245	5
Future Vol, veh/h	10	5	20	90	5	45	5	760	40	40	1245	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	10	5	20	90	5	45	5	760	40	40	1245	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2143	2138	1248	2110	2100	760	1250	0	0	800	0	0
Stage 1	1328	1328	-	770	770	-	-	-	-	-	-	-
Stage 2	815	810	-	1340	1330	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	4	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	5.4	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	2.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	35	48	209	~ 37	51	646	550	-	-	814	-	-
Stage 1	189	222	-	457	407	-	-	-	-	-	-	-
Stage 2	368	390	-	722	222	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	45	209	~ 29	48	646	550	-	-	814	-	-
Mov Cap-2 Maneuver	29	45	-	~ 29	48	-	-	-	-	-	-	-
Stage 1	187	211	-	453	403	-	-	-	-	-	-	-
Stage 2	335	386	-	606	211	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	118	$ 853	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	550	-	-	63	30	646	814	-	-
HCM Lane V/C Ratio	0.009	-	-	0.556	3.167	0.07	0.049	-	-
HCM Control Delay (s)	11.6	-	-	118	$ 1251.8	11	9.7	-	-
HCM Lane LOS	B	-	-	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.3	11.3	0.2	0.2	-	-

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

Intersection	
Int Delay, s/veh	50.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	15	80	5	60	10	1040	85	65	955	10
Future Vol, veh/h	5	5	15	80	5	60	10	1040	85	65	955	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	15	80	5	60	10	1040	85	65	955	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2225	2235	960	2203	2198	1083	965	0	0	1125	0	0
Stage 1	1090	1090	-	1103	1103	-	-	-	-	-	-	-
Stage 2	1135	1145	-	1100	1095	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	5.1	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	31	43	311	~ 32	45	370	714	-	-	621	-	-
Stage 1	261	291	-	256	287	-	-	-	-	-	-	-
Stage 2	246	274	-	257	290	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	21	38	311	~ 25	40	370	714	-	-	621	-	-
Mov Cap-2 Maneuver	21	38	-	~ 25	40	-	-	-	-	-	-	-
Stage 1	257	260	-	252	283	-	-	-	-	-	-	-
Stage 2	200	270	-	215	260	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	102.5	$ 789.7	0.1	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	714	-	-	60	26	370	621	-	-
HCM Lane V/C Ratio	0.014	-	-	0.417	3.269	0.162	0.105	-	-
HCM Control Delay (s)	10.1	-	-	102.5	$ 1335.5	16.6	11.5	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	10.4	0.6	0.3	-	-

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

Intersection	
Int Delay, s/veh	13.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	10	40	5	45	5	1100	40	30	1050	5
Future Vol, veh/h	5	5	10	40	5	45	5	1100	40	30	1050	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	100	-	25	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	10	40	5	45	5	1100	40	30	1050	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2268	2263	1053	2230	2225	1100	1055	0	0	1140	0	0
Stage 1	1113	1113	-	1110	1110	-	-	-	-	-	-	-
Stage 2	1155	1150	-	1120	1115	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	4	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	5.4	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	2.5	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	29	41	275	~ 31	43	509	660	-	-	613	-	-
Stage 1	253	284	-	317	285	-	-	-	-	-	-	-
Stage 2	240	273	-	773	283	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	23	39	275	~ 26	41	509	660	-	-	613	-	-
Mov Cap-2 Maneuver	23	39	-	~ 26	41	-	-	-	-	-	-	-
Stage 1	251	270	-	314	283	-	-	-	-	-	-	-
Stage 2	213	271	-	695	269	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	112.3	$ 325.5	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	660	-	-	52	27	509	613	-	-
HCM Lane V/C Ratio	0.008	-	-	0.385	1.667	0.088	0.049	-	-
HCM Control Delay (s)	10.5	-	-	112.3	$ 638.3	12.8	11.2	-	-
HCM Lane LOS	B	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.4	5.4	0.3	0.2	-	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	21	0	47	5	879	63	36	519	4
Future Volume (veh/h)	1	0	1	21	0	47	5	879	63	36	519	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	1	0	1	22	0	49	5	925	66	38	546	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	5	0	5	166	0	148	24	1003	72	125	1183	9
Arrive On Green	0.01	0.00	0.01	0.10	0.00	0.10	0.01	0.61	0.61	0.07	0.66	0.66
Sat Flow, veh/h	805	0	805	1711	0	1522	1711	1657	118	1711	1781	13
Grp Volume(v), veh/h	2	0	0	22	0	49	5	0	991	38	0	550
Grp Sat Flow(s),veh/h/ln	1611	0	0	1711	0	1522	1711	0	1775	1711	0	1794
Q Serve(g_s), s	0.1	0.0	0.0	1.1	0.0	2.9	0.3	0.0	48.0	2.0	0.0	14.3
Cycle Q Clear(g_c), s	0.1	0.0	0.0	1.1	0.0	2.9	0.3	0.0	48.0	2.0	0.0	14.3
Prop In Lane	0.50		0.50	1.00		1.00	1.00		0.07	1.00		0.01
Lane Grp Cap(c), veh/h	10	0	0	166	0	148	24	0	1075	125	0	1192
V/C Ratio(X)	0.21	0.00	0.00	0.13	0.00	0.33	0.20	0.00	0.92	0.30	0.00	0.46
Avail Cap(c_a), veh/h	268	0	0	285	0	253	196	0	1403	196	0	1418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	0.0	39.7	0.0	40.5	46.9	0.0	16.9	42.3	0.0	7.8
Incr Delay (d2), s/veh	10.4	0.0	0.0	0.4	0.0	1.3	4.0	0.0	8.6	1.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.5	0.0	1.1	0.1	0.0	18.2	0.9	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	0.0	0.0	40.1	0.0	41.8	50.9	0.0	25.5	43.6	0.0	8.1
LnGrp LOS	E	A	A	D	A	D	D	A	C	D	A	A
Approach Vol, veh/h		2			71			996			588	
Approach Delay, s/veh		58.0			41.3			25.7			10.4	
Approach LOS		E			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	65.1		5.3	6.1	70.8		14.0				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 11	76.0		* 16	* 11	76.0		16.0				
Max Q Clear Time (g_c+I1), s	4.0	50.0		2.1	2.3	16.3		4.9				
Green Ext Time (p_c), s	0.0	8.3		0.0	0.0	3.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			20.9									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	2	18	2	21	5	1015	56	36	471	3
Future Volume (veh/h)	9	0	2	18	2	21	5	1015	56	36	471	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	10	0	2	20	2	23	5	1103	61	39	512	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	8	8	8	8	8	8	8	8	8
Cap, veh/h	20	0	4	56	6	55	24	1182	1001	125	1279	7
Arrive On Green	0.01	0.00	0.01	0.04	0.04	0.04	0.01	0.66	0.66	0.07	0.72	0.72
Sat Flow, veh/h	1385	0	277	1549	155	1510	1697	1781	1510	1697	1769	10
Grp Volume(v), veh/h	12	0	0	22	0	23	5	1103	61	39	0	515
Grp Sat Flow(s),veh/h/ln	1662	0	0	1704	0	1510	1697	1781	1510	1697	0	1780
Q Serve(g_s), s	0.7	0.0	0.0	1.2	0.0	1.4	0.3	53.1	1.4	2.1	0.0	10.9
Cycle Q Clear(g_c), s	0.7	0.0	0.0	1.2	0.0	1.4	0.3	53.1	1.4	2.1	0.0	10.9
Prop In Lane	0.83		0.17	0.91		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	24	0	0	62	0	55	24	1182	1001	125	0	1286
V/C Ratio(X)	0.51	0.00	0.00	0.36	0.00	0.42	0.21	0.93	0.06	0.31	0.00	0.40
Avail Cap(c_a), veh/h	449	0	0	285	0	252	192	1396	1183	192	0	1395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.5	0.0	0.0	45.6	0.0	45.7	47.2	14.4	5.7	42.6	0.0	5.2
Incr Delay (d2), s/veh	15.8	0.0	0.0	3.4	0.0	5.1	4.1	10.6	0.0	1.4	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.6	0.0	0.6	0.1	19.4	0.4	0.9	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.2	0.0	0.0	49.1	0.0	50.8	51.4	25.0	5.8	44.0	0.0	5.4
LnGrp LOS	E	A	A	D	A	D	D	C	A	D	A	A
Approach Vol, veh/h		12			45			1169			554	
Approach Delay, s/veh		63.2			50.0			24.1			8.2	
Approach LOS		E			D			C			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.9	71.2		5.9	6.1	77.0		8.0
Change Period (Y+Rc), s	* 4.7	6.9		4.5	* 4.7	6.9		4.5
Max Green Setting (Gmax), s	* 11	76.0		26.2	* 11	76.0		16.2
Max Q Clear Time (g_c+I1), s	4.1	55.1		2.7	2.3	12.9		3.4
Green Ext Time (p_c), s	0.0	9.2		0.0	0.0	3.3		0.1

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	10	68	1	52	2	642	87	68	925	2
Future Volume (veh/h)	0	0	10	68	1	52	2	642	87	68	925	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	0	0	11	72	1	55	2	683	93	72	984	2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	0	0	46	213	3	192	10	786	107	185	1093	2
Arrive On Green	0.00	0.00	0.03	0.12	0.12	0.12	0.01	0.50	0.50	0.11	0.60	0.60
Sat Flow, veh/h	0	0	1560	1730	24	1560	1753	1586	216	1753	1836	4
Grp Volume(v), veh/h	0	0	11	73	0	55	2	0	776	72	0	986
Grp Sat Flow(s),veh/h/ln	0	0	1560	1754	0	1560	1753	0	1802	1753	0	1840
Q Serve(g_s), s	0.0	0.0	0.6	3.2	0.0	2.7	0.1	0.0	32.5	3.3	0.0	39.8
Cycle Q Clear(g_c), s	0.0	0.0	0.6	3.2	0.0	2.7	0.1	0.0	32.5	3.3	0.0	39.8
Prop In Lane	0.00		1.00	0.99		1.00	1.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	46	216	0	192	10	0	893	185	0	1095
V/C Ratio(X)	0.00	0.00	0.24	0.34	0.00	0.29	0.19	0.00	0.87	0.39	0.00	0.90
Avail Cap(c_a), veh/h	0	0	293	329	0	293	294	0	1643	294	0	1678
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	40.4	34.2	0.0	34.0	42.1	0.0	19.0	35.5	0.0	15.0
Incr Delay (d2), s/veh	0.0	0.0	2.6	0.9	0.0	0.8	8.6	0.0	2.8	1.3	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.3	1.4	0.0	1.1	0.1	0.0	12.1	1.4	0.0	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	43.0	35.1	0.0	34.8	50.7	0.0	21.8	36.9	0.0	19.8
LnGrp LOS	A	A	D	D	A	C	D	A	C	D	A	B
Approach Vol, veh/h		11			128			778			1058	
Approach Delay, s/veh		43.0			35.0			21.9			21.0	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.7	49.1		7.2	5.2	57.6		15.2
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7
Max Green Setting (Gmax), s	* 14	77.7		* 16	* 14	77.7		16.0
Max Q Clear Time (g_c+I1), s	5.3	34.5		2.6	2.1	41.8		5.2
Green Ext Time (p_c), s	0.1	6.0		0.0	0.0	8.9		0.3

Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	13	65	0	35	1	661	22	35	1023	3
Future Volume (veh/h)	5	2	13	65	0	35	1	661	22	35	1023	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	5	2	14	68	0	37	1	696	23	37	1077	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	19	8	53	182	0	162	5	1045	886	124	1165	3
Arrive On Green	0.05	0.05	0.05	0.10	0.00	0.10	0.00	0.57	0.57	0.07	0.64	0.64
Sat Flow, veh/h	387	155	1084	1753	0	1560	1753	1841	1560	1753	1835	5
Grp Volume(v), veh/h	21	0	0	68	0	37	1	696	23	37	0	1080
Grp Sat Flow(s),veh/h/ln	1626	0	0	1753	0	1560	1753	1841	1560	1753	0	1840
Q Serve(g_s), s	1.2	0.0	0.0	3.6	0.0	2.2	0.1	26.4	0.6	2.0	0.0	52.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	3.6	0.0	2.2	0.1	26.4	0.6	2.0	0.0	52.0
Prop In Lane	0.24		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	79	0	0	182	0	162	5	1045	886	124	0	1169
V/C Ratio(X)	0.27	0.00	0.00	0.37	0.00	0.23	0.19	0.67	0.03	0.30	0.00	0.92
Avail Cap(c_a), veh/h	259	0	0	280	0	249	192	1487	1260	192	0	1486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	0.0	41.9	0.0	41.3	49.9	15.1	9.5	44.3	0.0	16.2
Incr Delay (d2), s/veh	1.8	0.0	0.0	1.3	0.0	0.7	16.4	0.7	0.0	1.3	0.0	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.6	0.0	0.9	0.0	9.7	0.2	0.9	0.0	20.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	0.0	0.0	43.2	0.0	42.0	66.3	15.8	9.5	45.6	0.0	24.7
LnGrp LOS	D	A	A	D	A	D	E	B	A	D	A	C
Approach Vol, veh/h		21			105			720			1117	
Approach Delay, s/veh		47.8			42.7			15.7			25.4	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.8	63.8		9.6	5.0	70.6		15.1
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7
Max Green Setting (Gmax), s	* 11	81.0		* 16	* 11	81.0		16.0
Max Q Clear Time (g_c+I1), s	4.0	28.4		3.2	2.1	54.0		5.6
Green Ext Time (p_c), s	0.0	5.1		0.0	0.0	9.7		0.3

Intersection Summary		
HCM 6th Ctrl Delay		23.0
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	9	58	1	42	6	856	69	51	786	6
Future Volume (veh/h)	3	1	9	58	1	42	6	856	69	51	786	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	1	9	61	1	44	6	901	73	54	827	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	4	38	180	3	162	30	981	79	150	1191	9
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.02	0.57	0.57	0.08	0.64	0.64
Sat Flow, veh/h	380	127	1140	1754	29	1585	1781	1707	138	1781	1854	13
Grp Volume(v), veh/h	13	0	0	62	0	44	6	0	974	54	0	833
Grp Sat Flow(s),veh/h/ln	1646	0	0	1783	0	1585	1781	0	1845	1781	0	1868
Q Serve(g_s), s	0.8	0.0	0.0	3.3	0.0	2.6	0.3	0.0	48.6	2.9	0.0	29.4
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.3	0.0	2.6	0.3	0.0	48.6	2.9	0.0	29.4
Prop In Lane	0.23		0.69	0.98		1.00	1.00		0.07	1.00		0.01
Lane Grp Cap(c), veh/h	55	0	0	182	0	162	30	0	1060	150	0	1199
V/C Ratio(X)	0.24	0.00	0.00	0.34	0.00	0.27	0.20	0.00	0.92	0.36	0.00	0.69
Avail Cap(c_a), veh/h	258	0	0	279	0	248	192	0	1404	249	0	1481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.1	0.0	0.0	42.6	0.0	42.3	49.5	0.0	19.6	44.2	0.0	11.8
Incr Delay (d2), s/veh	2.2	0.0	0.0	1.1	0.0	0.9	3.2	0.0	8.2	1.4	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.5	0.0	1.1	0.2	0.0	20.0	1.3	0.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	0.0	43.7	0.0	43.2	52.7	0.0	27.8	45.6	0.0	12.9
LnGrp LOS	D	A	A	D	A	D	D	A	C	D	A	B
Approach Vol, veh/h		13			106			980			887	
Approach Delay, s/veh		50.3			43.5			27.9			14.9	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.3	65.6		8.1	6.4	72.5		15.2				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 14	77.7		* 16	* 11	81.0		16.0				
Max Q Clear Time (g_c+I1), s	4.9	50.6		2.8	2.3	31.4		5.3				
Green Ext Time (p_c), s	0.1	8.1		0.0	0.0	6.7		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			23.1
HCM 6th LOS			C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	1	28	1	36	0	945	30	30	819	1
Future Volume (veh/h)	2	1	1	28	1	36	0	945	30	30	819	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2	1	1	29	1	37	0	974	31	31	844	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	10	5	5	175	6	161	2	1084	918	119	1307	2
Arrive On Green	0.01	0.01	0.01	0.10	0.10	0.10	0.00	0.58	0.58	0.07	0.70	0.70
Sat Flow, veh/h	874	437	437	1725	59	1585	1781	1870	1585	1781	1868	2
Grp Volume(v), veh/h	4	0	0	30	0	37	0	974	31	31	0	845
Grp Sat Flow(s),veh/h/ln	1748	0	0	1784	0	1585	1781	1870	1585	1781	0	1870
Q Serve(g_s), s	0.2	0.0	0.0	1.3	0.0	1.9	0.0	39.8	0.7	1.4	0.0	21.6
Cycle Q Clear(g_c), s	0.2	0.0	0.0	1.3	0.0	1.9	0.0	39.8	0.7	1.4	0.0	21.6
Prop In Lane	0.50		0.25	0.97		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	20	0	0	181	0	161	2	1084	918	119	0	1309
V/C Ratio(X)	0.20	0.00	0.00	0.17	0.00	0.23	0.00	0.90	0.03	0.26	0.00	0.65
Avail Cap(c_a), veh/h	321	0	0	328	0	291	225	1631	1382	225	0	1631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.7	0.0	0.0	35.8	0.0	36.0	0.0	16.1	7.9	38.6	0.0	7.2
Incr Delay (d2), s/veh	4.6	0.0	0.0	0.4	0.0	0.7	0.0	4.9	0.0	1.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.6	0.0	0.7	0.0	14.9	0.2	0.6	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	0.0	0.0	36.2	0.0	36.8	0.0	21.0	7.9	39.8	0.0	7.8
LnGrp LOS	D	A	A	D	A	D	A	C	A	D	A	A
Approach Vol, veh/h		4			67			1005			876	
Approach Delay, s/veh		47.3			36.5			20.6			8.9	
Approach LOS		D			D			C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.5	57.4		5.7	0.0	67.9		13.5				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 11	76.0		* 16	* 11	76.0		16.0				
Max Q Clear Time (g_c+I1), s	3.4	41.8		2.2	0.0	23.6		3.9				
Green Ext Time (p_c), s	0.0	8.7		0.0	0.0	6.9		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		15.9
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	5	25	5	55	10	965	70	40	570	5
Future Volume (veh/h)	5	5	5	25	5	55	10	965	70	40	570	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	5	5	5	25	5	55	10	965	70	40	570	5
Peak Hour 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
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	20	20	20	129	26	136	45	1029	75	118	1182	10
Arrive On Green	0.04	0.04	0.04	0.09	0.09	0.09	0.03	0.62	0.62	0.07	0.66	0.66
Sat Flow, veh/h	556	556	556	1437	287	1522	1711	1655	120	1711	1778	16
Grp Volume(v), veh/h	15	0	0	30	0	55	10	0	1035	40	0	575
Grp Sat Flow(s),veh/h/ln	1668	0	0	1724	0	1522	1711	0	1775	1711	0	1793
Q Serve(g_s), s	1.0	0.0	0.0	1.8	0.0	3.9	0.7	0.0	60.7	2.6	0.0	18.1
Cycle Q Clear(g_c), s	1.0	0.0	0.0	1.8	0.0	3.9	0.7	0.0	60.7	2.6	0.0	18.1
Prop In Lane	0.33		0.33	0.83		1.00	1.00		0.07	1.00		0.01
Lane Grp Cap(c), veh/h	61	0	0	154	0	136	45	0	1103	118	0	1192
V/C Ratio(X)	0.25	0.00	0.00	0.19	0.00	0.40	0.22	0.00	0.94	0.34	0.00	0.48
Avail Cap(c_a), veh/h	233	0	0	241	0	213	164	0	1332	164	0	1346
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	0.0	0.0	48.3	0.0	49.3	54.7	0.0	19.7	50.8	0.0	9.5
Incr Delay (d2), s/veh	2.1	0.0	0.0	0.6	0.0	1.9	2.5	0.0	11.4	1.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.8	0.0	1.6	0.3	0.0	24.6	1.1	0.0	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	0.0	0.0	48.9	0.0	51.2	57.1	0.0	31.1	52.5	0.0	9.8
LnGrp LOS	E	A	A	D	A	D	E	A	C	D	A	A
Approach Vol, veh/h		15			85			1045			615	
Approach Delay, s/veh		55.8			50.4			31.4			12.6	
Approach LOS		E			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.6	78.1		8.9	7.7	83.1		15.0				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 11	86.0		* 16	* 11	86.0		16.0				
Max Q Clear Time (g_c+I1), s	4.6	62.7		3.0	2.7	20.1		5.9				
Green Ext Time (p_c), s	0.0	8.6		0.0	0.0	3.9		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			25.9
HCM 6th LOS			C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	5	5	25	5	25	10	1115	65	40	520	5
Future Volume (veh/h)	15	5	5	25	5	25	10	1115	65	40	520	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	15	5	5	25	5	25	10	1115	65	40	520	5
Peak Hour 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
Percent Heavy Veh, %	8	8	8	8	8	8	8	8	8	8	8	8
Cap, veh/h	25	8	8	55	11	58	45	1181	1001	124	1249	12
Arrive On Green	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.66	0.66	0.07	0.71	0.71
Sat Flow, veh/h	1003	334	334	1425	285	1510	1697	1781	1510	1697	1761	17
Grp Volume(v), veh/h	25	0	0	30	0	25	10	1115	65	40	0	525
Grp Sat Flow(s),veh/h/ln	1671	0	0	1710	0	1510	1697	1781	1510	1697	0	1778
Q Serve(g_s), s	1.5	0.0	0.0	1.8	0.0	1.7	0.6	57.9	1.6	2.3	0.0	12.5
Cycle Q Clear(g_c), s	1.5	0.0	0.0	1.8	0.0	1.7	0.6	57.9	1.6	2.3	0.0	12.5
Prop In Lane	0.60		0.20	0.83		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	42	0	0	66	0	58	45	1181	1001	124	0	1261
V/C Ratio(X)	0.60	0.00	0.00	0.45	0.00	0.43	0.22	0.94	0.06	0.32	0.00	0.42
Avail Cap(c_a), veh/h	427	0	0	270	0	238	182	1320	1118	182	0	1318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.5	0.0	0.0	48.3	0.0	48.2	48.9	15.6	6.1	45.1	0.0	6.2
Incr Delay (d2), s/veh	13.2	0.0	0.0	4.8	0.0	4.9	2.4	12.9	0.0	1.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.8	0.0	0.7	0.3	22.3	0.4	1.0	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.7	0.0	0.0	53.1	0.0	53.1	51.3	28.5	6.1	46.6	0.0	6.4
LnGrp LOS	E	A	A	D	A	D	D	C	A	D	A	A
Approach Vol, veh/h		25			55			1190			565	
Approach Delay, s/veh		62.7			53.1			27.5			9.2	
Approach LOS		E			D			C			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.2	74.9		7.0	7.4	79.7		8.5
Change Period (Y+Rc), s	* 4.7	6.9		4.5	* 4.7	6.9		4.5
Max Green Setting (Gmax), s	* 11	76.0		26.2	* 11	76.0		16.2
Max Q Clear Time (g_c+I1), s	4.3	59.9		3.5	2.6	14.5		3.8
Green Ext Time (p_c), s	0.0	8.1		0.1	0.0	3.4		0.1

Intersection Summary		
HCM 6th Ctrl Delay		23.1
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	15	65	5	55	5	670	85	75	1015	5
Future Volume (veh/h)	10	5	15	65	5	55	5	670	85	75	1015	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	10	5	15	65	5	55	5	670	85	75	1015	5
Peak Hour 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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	35	17	52	176	14	168	25	833	106	170	1103	5
Arrive On Green	0.06	0.06	0.06	0.11	0.11	0.11	0.01	0.52	0.52	0.10	0.60	0.60
Sat Flow, veh/h	554	277	832	1633	126	1560	1753	1601	203	1753	1830	9
Grp Volume(v), veh/h	30	0	0	70	0	55	5	0	755	75	0	1020
Grp Sat Flow(s),veh/h/ln	1663	0	0	1759	0	1560	1753	0	1804	1753	0	1839
Q Serve(g_s), s	1.7	0.0	0.0	3.7	0.0	3.2	0.3	0.0	34.1	4.0	0.0	48.8
Cycle Q Clear(g_c), s	1.7	0.0	0.0	3.7	0.0	3.2	0.3	0.0	34.1	4.0	0.0	48.8
Prop In Lane	0.33		0.50	0.93		1.00	1.00		0.11	1.00		0.00
Lane Grp Cap(c), veh/h	104	0	0	190	0	168	25	0	938	170	0	1109
V/C Ratio(X)	0.29	0.00	0.00	0.37	0.00	0.33	0.20	0.00	0.80	0.44	0.00	0.92
Avail Cap(c_a), veh/h	269	0	0	285	0	253	254	0	1419	254	0	1447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	40.9	0.0	40.8	48.1	0.0	19.6	42.1	0.0	17.5
Incr Delay (d2), s/veh	1.5	0.0	0.0	1.2	0.0	1.1	3.8	0.0	2.1	1.8	0.0	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	1.6	0.0	1.3	0.1	0.0	13.0	1.7	0.0	19.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	0.0	0.0	42.1	0.0	41.9	52.0	0.0	21.6	43.8	0.0	25.7
LnGrp LOS	D	A	A	D	A	D	D	A	C	D	A	C
Approach Vol, veh/h		30			125			760			1095	
Approach Delay, s/veh		45.7			42.0			21.8			26.9	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.3	58.3		10.9	6.1	66.5		15.3
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7
Max Green Setting (Gmax), s	* 14	77.7		* 16	* 14	77.7		16.0
Max Q Clear Time (g_c+I1), s	6.0	36.1		3.7	2.3	50.8		5.7
Green Ext Time (p_c), s	0.1	5.8		0.1	0.0	8.7		0.3

Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	15	75	5	40	5	685	35	40	1125	5
Future Volume (veh/h)	10	5	15	75	5	40	5	685	35	40	1125	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	10	5	15	75	5	40	5	685	35	40	1125	5
Peak Hour 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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	33	16	49	156	10	147	25	1090	924	122	1186	5
Arrive On Green	0.06	0.06	0.06	0.09	0.09	0.09	0.01	0.59	0.59	0.07	0.65	0.65
Sat Flow, veh/h	554	277	832	1648	110	1560	1753	1841	1560	1753	1831	8
Grp Volume(v), veh/h	30	0	0	80	0	40	5	685	35	40	0	1130
Grp Sat Flow(s),veh/h/ln	1663	0	0	1758	0	1560	1753	1841	1560	1753	0	1839
Q Serve(g_s), s	2.0	0.0	0.0	4.9	0.0	2.7	0.3	27.5	1.1	2.5	0.0	63.9
Cycle Q Clear(g_c), s	2.0	0.0	0.0	4.9	0.0	2.7	0.3	27.5	1.1	2.5	0.0	63.9
Prop In Lane	0.33		0.50	0.94		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	99	0	0	166	0	147	25	1090	924	122	0	1191
V/C Ratio(X)	0.30	0.00	0.00	0.48	0.00	0.27	0.20	0.63	0.04	0.33	0.00	0.95
Avail Cap(c_a), veh/h	234	0	0	247	0	219	170	1311	1111	170	0	1310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	0.0	0.0	48.9	0.0	47.9	55.4	15.1	9.7	50.4	0.0	18.3
Incr Delay (d2), s/veh	1.7	0.0	0.0	2.2	0.0	1.0	3.9	0.7	0.0	1.6	0.0	13.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	2.3	0.0	1.1	0.2	10.4	0.3	1.1	0.0	26.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	0.0	0.0	51.0	0.0	48.8	59.4	15.8	9.7	52.0	0.0	32.1
LnGrp LOS	D	A	A	D	A	D	E	B	A	D	A	C
Approach Vol, veh/h		30			120			725			1170	
Approach Delay, s/veh		53.0			50.3			15.8			32.8	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.6	74.3		11.4	6.3	80.6		15.5
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7
Max Green Setting (Gmax), s	* 11	81.0		* 16	* 11	81.0		16.0
Max Q Clear Time (g_c+I1), s	4.5	29.5		4.0	2.3	65.9		6.9
Green Ext Time (p_c), s	0.0	5.0		0.1	0.0	7.8		0.3

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	15	70	5	50	10	940	80	60	860	10
Future Volume (veh/h)	5	5	15	70	5	50	10	940	80	60	860	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	5	15	70	5	50	10	940	80	60	860	10
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	18	18	53	157	11	149	47	1001	85	145	1189	14
Arrive On Green	0.05	0.05	0.05	0.09	0.09	0.09	0.03	0.59	0.59	0.08	0.64	0.64
Sat Flow, veh/h	335	335	1004	1668	119	1585	1781	1700	145	1781	1845	21
Grp Volume(v), veh/h	25	0	0	75	0	50	10	0	1020	60	0	870
Grp Sat Flow(s),veh/h/ln	1673	0	0	1787	0	1585	1781	0	1844	1781	0	1866
Q Serve(g_s), s	1.7	0.0	0.0	4.6	0.0	3.4	0.6	0.0	58.4	3.7	0.0	35.7
Cycle Q Clear(g_c), s	1.7	0.0	0.0	4.6	0.0	3.4	0.6	0.0	58.4	3.7	0.0	35.7
Prop In Lane	0.20		0.60	0.93		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	88	0	0	168	0	149	47	0	1086	145	0	1203
V/C Ratio(X)	0.28	0.00	0.00	0.45	0.00	0.34	0.21	0.00	0.94	0.41	0.00	0.72
Avail Cap(c_a), veh/h	233	0	0	249	0	221	171	0	1248	222	0	1316
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	0.0	49.2	0.0	48.7	54.8	0.0	21.7	50.1	0.0	13.6
Incr Delay (d2), s/veh	1.7	0.0	0.0	1.9	0.0	1.3	2.3	0.0	12.5	1.9	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	2.1	0.0	1.4	0.3	0.0	25.6	1.7	0.0	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.1	0.0	0.0	51.1	0.0	50.0	57.0	0.0	34.2	52.0	0.0	15.4
LnGrp LOS	D	A	A	D	A	D	E	A	C	D	A	B
Approach Vol, veh/h		25			125			1030			930	
Approach Delay, s/veh		54.1			50.6			34.5			17.8	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.1	74.5		10.7	7.7	80.9		15.5				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 14	77.7		* 16	* 11	81.0		16.0				
Max Q Clear Time (g_c+I1), s	5.7	60.4		3.7	2.6	37.7		6.6				
Green Ext Time (p_c), s	0.1	7.2		0.0	0.0	7.2		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			28.3									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	5	35	5	40	5	990	35	30	950	5
Future Volume (veh/h)	5	5	5	35	5	40	5	990	35	30	950	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	5	5	35	5	40	5	990	35	30	950	5
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	22	22	158	23	160	25	1086	920	112	1170	6
Arrive On Green	0.04	0.04	0.04	0.10	0.10	0.10	0.01	0.58	0.58	0.06	0.63	0.63
Sat Flow, veh/h	579	579	579	1568	224	1585	1781	1870	1585	1781	1859	10
Grp Volume(v), veh/h	15	0	0	40	0	40	5	990	35	30	0	955
Grp Sat Flow(s),veh/h/ln	1737	0	0	1792	0	1585	1781	1870	1585	1781	0	1869
Q Serve(g_s), s	0.8	0.0	0.0	2.0	0.0	2.2	0.3	45.5	0.9	1.5	0.0	37.3
Cycle Q Clear(g_c), s	0.8	0.0	0.0	2.0	0.0	2.2	0.3	45.5	0.9	1.5	0.0	37.3
Prop In Lane	0.33		0.33	0.87		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	66	0	0	180	0	160	25	1086	920	112	0	1176
V/C Ratio(X)	0.23	0.00	0.00	0.22	0.00	0.25	0.20	0.91	0.04	0.27	0.00	0.81
Avail Cap(c_a), veh/h	288	0	0	297	0	263	203	1475	1250	203	0	1473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	0.0	39.9	0.0	40.0	47.0	18.0	8.7	43.0	0.0	13.5
Incr Delay (d2), s/veh	1.8	0.0	0.0	0.6	0.0	0.8	3.7	7.0	0.0	1.3	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.9	0.0	0.9	0.1	18.3	0.3	0.7	0.0	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	0.0	40.5	0.0	40.8	50.7	25.0	8.7	44.3	0.0	16.4
LnGrp LOS	D	A	A	D	A	D	D	C	A	D	A	B
Approach Vol, veh/h		15			80			1030			985	
Approach Delay, s/veh		46.8			40.6			24.6			17.3	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	62.9		8.3	6.1	67.6		14.4
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7
Max Green Setting (Gmax), s	* 11	76.0		* 16	* 11	76.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	47.5		2.8	2.3	39.3		4.2
Green Ext Time (p_c), s	0.0	8.5		0.0	0.0	8.4		0.2

Intersection Summary	
HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	5	30	5	65	10	1070	80	45	630	10
Future Volume (veh/h)	5	5	5	30	5	65	10	1070	80	45	630	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	5	5	5	30	5	65	10	1070	80	45	630	10
Peak Hour 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
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	20	20	20	121	20	124	44	1081	81	116	1229	20
Arrive On Green	0.04	0.04	0.04	0.08	0.08	0.08	0.03	0.66	0.66	0.07	0.70	0.70
Sat Flow, veh/h	556	556	556	1476	246	1522	1711	1651	123	1711	1763	28
Grp Volume(v), veh/h	15	0	0	35	0	65	10	0	1150	45	0	640
Grp Sat Flow(s),veh/h/ln	1668	0	0	1722	0	1522	1711	0	1774	1711	0	1791
Q Serve(g_s), s	1.1	0.0	0.0	2.5	0.0	5.4	0.8	0.0	83.3	3.3	0.0	22.1
Cycle Q Clear(g_c), s	1.1	0.0	0.0	2.5	0.0	5.4	0.8	0.0	83.3	3.3	0.0	22.1
Prop In Lane	0.33		0.33	0.86		1.00	1.00		0.07	1.00		0.02
Lane Grp Cap(c), veh/h	59	0	0	141	0	124	44	0	1162	116	0	1249
V/C Ratio(X)	0.25	0.00	0.00	0.25	0.00	0.52	0.23	0.00	0.99	0.39	0.00	0.51
Avail Cap(c_a), veh/h	204	0	0	210	0	186	144	0	1164	144	0	1249
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.5	0.0	0.0	56.4	0.0	57.7	62.6	0.0	22.2	58.5	0.0	9.4
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.9	0.0	3.4	2.6	0.0	23.8	2.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.1	0.0	2.2	0.4	0.0	37.1	1.5	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.8	0.0	0.0	57.3	0.0	61.1	65.2	0.0	45.9	60.6	0.0	9.7
LnGrp LOS	E	A	A	E	A	E	E	A	D	E	A	A
Approach Vol, veh/h		15			100			1160			685	
Approach Delay, s/veh		63.8			59.8			46.1			13.1	
Approach LOS		E			E			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.6	92.7		9.3	8.1	98.2		15.4				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 11	86.0		* 16	* 11	86.0		16.0				
Max Q Clear Time (g_c+I1), s	5.3	85.3		3.1	2.8	24.1		7.4				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	4.5		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			35.4
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	5	5	25	5	30	10	1230	70	45	575	5
Future Volume (veh/h)	15	5	5	25	5	30	10	1230	70	45	575	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	15	5	5	25	5	30	10	1230	70	45	575	5
Peak Hour 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
Percent Heavy Veh, %	8	8	8	8	8	8	8	8	8	8	8	8
Cap, veh/h	24	8	8	54	11	57	45	1211	1026	126	1283	11
Arrive On Green	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.68	0.68	0.07	0.73	0.73
Sat Flow, veh/h	1003	334	334	1425	285	1510	1697	1781	1510	1697	1763	15
Grp Volume(v), veh/h	25	0	0	30	0	30	10	1230	70	45	0	580
Grp Sat Flow(s),veh/h/ln	1671	0	0	1710	0	1510	1697	1781	1510	1697	0	1779
Q Serve(g_s), s	1.7	0.0	0.0	1.9	0.0	2.2	0.6	76.0	1.7	2.8	0.0	14.7
Cycle Q Clear(g_c), s	1.7	0.0	0.0	1.9	0.0	2.2	0.6	76.0	1.7	2.8	0.0	14.7
Prop In Lane	0.60		0.20	0.83		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	40	0	0	65	0	57	45	1211	1026	126	0	1294
V/C Ratio(X)	0.62	0.00	0.00	0.46	0.00	0.53	0.22	1.02	0.07	0.36	0.00	0.45
Avail Cap(c_a), veh/h	392	0	0	248	0	219	167	1211	1026	167	0	1294
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.0	0.0	0.0	52.7	0.0	52.8	53.3	17.9	6.0	49.2	0.0	6.2
Incr Delay (d2), s/veh	14.5	0.0	0.0	5.1	0.0	7.3	2.5	29.8	0.0	1.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.9	0.0	0.9	0.3	34.3	0.5	1.2	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.5	0.0	0.0	57.8	0.0	60.1	55.8	47.7	6.0	51.0	0.0	6.4
LnGrp LOS	E	A	A	E	A	E	E	F	A	D	A	A
Approach Vol, veh/h		25			60			1310			625	
Approach Delay, s/veh		68.5			59.0			45.6			9.6	
Approach LOS		E			E			D			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	82.9		7.2	7.6	88.2		8.7
Change Period (Y+Rc), s	* 4.7	6.9		4.5	* 4.7	6.9		4.5
Max Green Setting (Gmax), s	* 11	76.0		26.2	* 11	76.0		16.2
Max Q Clear Time (g_c+I1), s	4.8	78.0		3.7	2.6	16.7		4.2
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.9		0.1

Intersection Summary		
HCM 6th Ctrl Delay		35.1
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	20	75	5	65	5	740	95	85	1125	5
Future Volume (veh/h)	10	5	20	75	5	65	5	740	95	85	1125	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	10	5	20	75	5	65	5	740	95	85	1125	5
Peak Hour 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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	30	15	61	157	10	149	25	905	116	158	1175	5
Arrive On Green	0.06	0.06	0.06	0.10	0.10	0.10	0.01	0.57	0.57	0.09	0.64	0.64
Sat Flow, veh/h	471	235	942	1648	110	1560	1753	1599	205	1753	1831	8
Grp Volume(v), veh/h	35	0	0	80	0	65	5	0	835	85	0	1130
Grp Sat Flow(s),veh/h/ln	1648	0	0	1758	0	1560	1753	0	1804	1753	0	1839
Q Serve(g_s), s	2.3	0.0	0.0	4.9	0.0	4.5	0.3	0.0	42.7	5.3	0.0	65.1
Cycle Q Clear(g_c), s	2.3	0.0	0.0	4.9	0.0	4.5	0.3	0.0	42.7	5.3	0.0	65.1
Prop In Lane	0.29		0.57	0.94		1.00	1.00		0.11	1.00		0.00
Lane Grp Cap(c), veh/h	106	0	0	168	0	149	25	0	1021	158	0	1180
V/C Ratio(X)	0.33	0.00	0.00	0.48	0.00	0.44	0.20	0.00	0.82	0.54	0.00	0.96
Avail Cap(c_a), veh/h	231	0	0	247	0	219	220	0	1229	220	0	1253
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	0.0	0.0	48.9	0.0	48.7	55.6	0.0	20.0	49.7	0.0	19.0
Incr Delay (d2), s/veh	1.8	0.0	0.0	2.1	0.0	2.0	3.9	0.0	3.8	2.8	0.0	15.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	2.3	0.0	1.8	0.2	0.0	17.0	2.4	0.0	28.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	0.0	0.0	51.0	0.0	50.7	59.5	0.0	23.8	52.5	0.0	34.9
LnGrp LOS	D	A	A	D	A	D	E	A	C	D	A	C
Approach Vol, veh/h		35			145			840			1215	
Approach Delay, s/veh		52.8			50.9			24.0			36.1	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	71.5		12.1	6.3	80.1		15.6				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 14	77.7		* 16	* 14	77.7		16.0				
Max Q Clear Time (g_c+I1), s	7.3	44.7		4.3	2.3	67.1		6.9				
Green Ext Time (p_c), s	0.1	6.6		0.1	0.0	6.1		0.4				

Intersection Summary			
HCM 6th Ctrl Delay			32.8
HCM 6th LOS			C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	20	90	5	45	5	760	40	40	1245	5
Future Volume (veh/h)	10	5	20	90	5	45	5	760	40	40	1245	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	10	5	20	90	5	45	5	760	40	40	1245	5
Peak Hour 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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	29	15	59	148	8	139	25	1122	951	117	1214	5
Arrive On Green	0.06	0.06	0.06	0.09	0.09	0.09	0.01	0.61	0.61	0.07	0.66	0.66
Sat Flow, veh/h	471	235	942	1665	93	1560	1753	1841	1560	1753	1832	7
Grp Volume(v), veh/h	35	0	0	95	0	45	5	760	40	40	0	1250
Grp Sat Flow(s),veh/h/ln	1648	0	0	1757	0	1560	1753	1841	1560	1753	0	1839
Q Serve(g_s), s	2.5	0.0	0.0	6.4	0.0	3.3	0.3	33.6	1.3	2.7	0.0	81.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	6.4	0.0	3.3	0.3	33.6	1.3	2.7	0.0	81.0
Prop In Lane	0.29		0.57	0.95		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	103	0	0	157	0	139	25	1122	951	117	0	1219
V/C Ratio(X)	0.34	0.00	0.00	0.61	0.00	0.32	0.20	0.68	0.04	0.34	0.00	1.03
Avail Cap(c_a), veh/h	216	0	0	230	0	204	158	1219	1033	158	0	1219
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.9	0.0	0.0	53.6	0.0	52.2	59.6	15.9	9.6	54.5	0.0	20.6
Incr Delay (d2), s/veh	1.9	0.0	0.0	3.7	0.0	1.3	4.0	1.4	0.0	1.7	0.0	32.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	3.0	0.0	1.4	0.2	13.0	0.4	1.2	0.0	39.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.8	0.0	0.0	57.4	0.0	53.6	63.6	17.2	9.6	56.2	0.0	53.2
LnGrp LOS	E	A	A	E	A	D	E	B	A	E	A	F
Approach Vol, veh/h		35			140			805			1290	
Approach Delay, s/veh		56.8			56.1			17.1			53.3	
Approach LOS		E			E			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	81.4		12.3	6.4	87.9		15.6
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7
Max Green Setting (Gmax), s	* 11	81.0		* 16	* 11	81.0		16.0
Max Q Clear Time (g_c+I1), s	4.7	35.6		4.5	2.3	83.0		8.4
Green Ext Time (p_c), s	0.0	5.9		0.1	0.0	0.0		0.3

Intersection Summary			
HCM 6th Ctrl Delay			40.7
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	15	80	5	60	10	1040	85	65	955	10
Future Volume (veh/h)	5	5	15	80	5	60	10	1040	85	65	955	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	5	15	80	5	60	10	1040	85	65	955	10
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	17	17	51	146	9	138	46	1052	86	140	1237	13
Arrive On Green	0.05	0.05	0.05	0.09	0.09	0.09	0.03	0.62	0.62	0.08	0.67	0.67
Sat Flow, veh/h	335	335	1004	1681	105	1585	1781	1706	139	1781	1848	19
Grp Volume(v), veh/h	25	0	0	85	0	60	10	0	1125	65	0	965
Grp Sat Flow(s),veh/h/ln	1673	0	0	1786	0	1585	1781	0	1845	1781	0	1867
Q Serve(g_s), s	1.8	0.0	0.0	5.7	0.0	4.5	0.7	0.0	75.3	4.4	0.0	44.5
Cycle Q Clear(g_c), s	1.8	0.0	0.0	5.7	0.0	4.5	0.7	0.0	75.3	4.4	0.0	44.5
Prop In Lane	0.20		0.60	0.94		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	85	0	0	155	0	138	46	0	1138	140	0	1250
V/C Ratio(X)	0.29	0.00	0.00	0.55	0.00	0.44	0.22	0.00	0.99	0.47	0.00	0.77
Avail Cap(c_a), veh/h	213	0	0	227	0	202	156	0	1140	202	0	1250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.5	0.0	0.0	55.1	0.0	54.5	60.0	0.0	23.7	55.4	0.0	14.2
Incr Delay (d2), s/veh	1.9	0.0	0.0	3.0	0.0	2.2	2.3	0.0	23.8	2.4	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.7	0.0	1.9	0.3	0.0	35.9	2.0	0.0	17.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	0.0	0.0	58.1	0.0	56.7	62.4	0.0	47.4	57.8	0.0	17.3
LnGrp LOS	E	A	A	E	A	E	E	A	D	E	A	B
Approach Vol, veh/h		25			145			1135			1030	
Approach Delay, s/veh		59.4			57.5			47.6			19.8	
Approach LOS		E			E			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.6	84.5		11.1	7.9	91.1		15.6				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 14	77.7		* 16	* 11	81.0		16.0				
Max Q Clear Time (g_c+I1), s	6.4	77.3		3.8	2.7	46.5		7.7				
Green Ext Time (p_c), s	0.1	0.3		0.0	0.0	8.4		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			36.1									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	10	40	5	45	5	1100	40	30	1050	5
Future Volume (veh/h)	5	5	10	40	5	45	5	1100	40	30	1050	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	5	10	40	5	45	5	1100	40	30	1050	5
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	19	19	38	142	18	141	25	1174	995	104	1250	6
Arrive On Green	0.04	0.04	0.04	0.09	0.09	0.09	0.01	0.63	0.63	0.06	0.67	0.67
Sat Flow, veh/h	424	424	848	1592	199	1585	1781	1870	1585	1781	1860	9
Grp Volume(v), veh/h	20	0	0	45	0	45	5	1100	40	30	0	1055
Grp Sat Flow(s),veh/h/ln	1696	0	0	1791	0	1585	1781	1870	1585	1781	0	1869
Q Serve(g_s), s	1.3	0.0	0.0	2.7	0.0	3.1	0.3	62.1	1.1	1.9	0.0	49.7
Cycle Q Clear(g_c), s	1.3	0.0	0.0	2.7	0.0	3.1	0.3	62.1	1.1	1.9	0.0	49.7
Prop In Lane	0.25		0.50	0.89		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	76	0	0	159	0	141	25	1174	995	104	0	1256
V/C Ratio(X)	0.26	0.00	0.00	0.28	0.00	0.32	0.20	0.94	0.04	0.29	0.00	0.84
Avail Cap(c_a), veh/h	232	0	0	245	0	217	168	1376	1166	168	0	1375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.0	0.0	0.0	49.8	0.0	49.9	57.0	19.7	8.3	52.7	0.0	14.4
Incr Delay (d2), s/veh	1.8	0.0	0.0	1.0	0.0	1.3	3.8	11.2	0.0	1.5	0.0	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	1.3	0.0	1.3	0.2	26.5	0.4	0.9	0.0	18.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	0.0	0.0	50.7	0.0	51.2	60.8	30.8	8.3	54.2	0.0	18.9
LnGrp LOS	E	A	A	D	A	D	E	C	A	D	A	B
Approach Vol, veh/h		20			90			1145			1085	
Approach Delay, s/veh		55.8			51.0			30.2			19.9	
Approach LOS		E			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	80.3		10.0	6.3	85.5		15.1				
Change Period (Y+Rc), s	* 4.7	6.9		* 4.7	* 4.7	6.9		4.7				
Max Green Setting (Gmax), s	* 11	86.0		* 16	* 11	86.0		16.0				
Max Q Clear Time (g_c+I1), s	3.9	64.1		3.3	2.3	51.7		5.1				
Green Ext Time (p_c), s	0.0	9.3		0.0	0.0	10.0		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		26.4
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix C – SimTraffic Queue Reports

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	1	3	18	39	3	489	30	34	493	3	1113
Vehicles Exited	1	3	19	39	3	490	29	34	488	3	1109
Hourly Exit Rate	1	3	19	39	3	490	29	34	488	3	1109
Input Volume	1	1	21	47	5	977	63	36	519	4	1674
% of Volume	100	300	89	83	60	50	46	95	94	75	66

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	9	2	20	2	23	2	500	28	35	476	3	1100
Vehicles Exited	9	2	20	2	23	3	490	28	35	474	3	1089
Hourly Exit Rate	9	2	20	2	23	3	490	28	35	474	3	1089
Input Volume	9	2	18	2	21	5	1015	56	36	506	3	1672
% of Volume	97	100	113	100	111	60	48	50	97	94	100	65

Total Network Performance

Vehicles Entered	1181
Vehicles Exited	1173
Hourly Exit Rate	1173
Input Volume	4973
% of Volume	24

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	30	68	60	23	17	51	11
Average Queue (ft)	3	18	29	2	1	12	2
95th Queue (ft)	18	54	61	12	11	36	18
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		6	4			0	
Queuing Penalty (veh)		3	1			0	

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB
Directions Served	LTR	LT	R	L	T	R	L
Maximum Queue (ft)	50	82	70	18	68	49	53
Average Queue (ft)	11	19	16	1	6	11	15
95th Queue (ft)	37	58	48	9	35	37	38
Link Distance (ft)	519	1400			7093		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	100		25	100
Storage Blk Time (%)		4	0		0	0	
Queuing Penalty (veh)		1	0		0	1	

Network Summary

Network wide Queuing Penalty: 6

1: SR 29 & Rutherford Road Performance by movement

Movement	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	12	68	1	46	2	467	68	34	465	1	1164
Vehicles Exited	12	63	1	45	2	454	65	33	450	1	1126
Hourly Exit Rate	12	63	1	45	2	454	65	33	450	1	1126
Input Volume	10	68	1	52	2	642	87	68	925	2	1857
% of Volume	117	92	100	87	100	71	75	48	49	50	61

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	5	2	16	68	37	0	509	17	19	520	2	1195
Vehicles Exited	5	2	16	56	31	0	493	17	18	505	2	1145
Hourly Exit Rate	5	2	16	56	31	0	493	17	18	505	2	1145
Input Volume	5	2	13	65	35	1	661	22	35	1023	3	1865
% of Volume	100	100	121	86	89	0	75	76	52	49	67	61

Total Network Performance

Vehicles Entered	1305
Vehicles Exited	1216
Hourly Exit Rate	1216
Input Volume	5740
% of Volume	21

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	45	245	56	30	43	52	84
Average Queue (ft)	11	102	37	1	7	13	44
95th Queue (ft)	37	234	68	12	28	38	87
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		57	6			0	0
Queuing Penalty (veh)		29	4			0	0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	T	R	L	TR
Maximum Queue (ft)	72	629	75	68	48	31	57
Average Queue (ft)	21	256	37	15	9	11	4
95th Queue (ft)	55	650	93	54	33	33	26
Link Distance (ft)	519	1400		7093			9777
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50		25	100	
Storage Blk Time (%)		75	1	1	0		
Queuing Penalty (veh)		26	0	0	0		

Network Summary

Network wide Queuing Penalty: 61

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	3	1	9	59	0	36	4	489	38	31	469	5
Vehicles Exited	3	1	9	59	0	37	5	486	38	30	464	5
Hourly Exit Rate	3	1	9	59	0	37	5	486	38	30	464	5
Input Volume	3	1	9	58	1	42	6	908	69	51	786	6
% of Volume	100	100	100	102	0	89	83	54	55	59	59	83

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1144
Vehicles Exited	1137
Hourly Exit Rate	1137
Input Volume	1940
% of Volume	59

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	1	2	2	27	1	39	508	19	19	514	1	1133
Vehicles Exited	1	2	2	26	1	40	491	19	19	512	1	1114
Hourly Exit Rate	1	2	2	26	1	40	491	19	19	512	1	1114
Input Volume	2	1	1	28	1	36	945	30	30	824	1	1900
% of Volume	50	200	200	92	100	110	52	63	63	62	100	59

Total Network Performance

Vehicles Entered	1214
Vehicles Exited	1186
Hourly Exit Rate	1186
Input Volume	5787
% of Volume	20

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	53	161	60	30	28	29	72
Average Queue (ft)	13	59	32	4	5	12	35
95th Queue (ft)	41	134	67	22	21	33	80
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		45	4				0
Queuing Penalty (veh)		19	3				0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	T	R	L
Maximum Queue (ft)	30	108	73	54	33	33
Average Queue (ft)	5	31	24	14	8	11
95th Queue (ft)	22	85	60	48	28	33
Link Distance (ft)	519	1400		7093		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50		25	100
Storage Blk Time (%)		18	1	1	0	
Queuing Penalty (veh)		6	0	0	0	

Network Summary

Network wide Queuing Penalty: 29

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	5	6	24	6	46	6	486	28	36	489	3
Vehicles Exited	6	5	6	24	6	47	5	489	26	37	484	3
Hourly Exit Rate	6	5	6	24	6	47	5	489	26	37	484	3
Input Volume	5	5	5	25	5	55	10	1075	70	40	570	5
% of Volume	120	100	120	95	120	85	49	45	37	93	85	60

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1141
Vehicles Exited	1138
Hourly Exit Rate	1138
Input Volume	1870
% of Volume	61

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	13	5	6	27	4	24	4	493	32	36	478	5
Vehicles Exited	13	5	6	27	4	24	4	484	30	36	475	5
Hourly Exit Rate	13	5	6	27	4	24	4	484	30	36	475	5
Input Volume	15	5	5	25	5	25	10	1115	65	40	558	5
% of Volume	85	100	120	109	80	97	39	43	46	90	85	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1127
Vehicles Exited	1113
Hourly Exit Rate	1113
Input Volume	1873
% of Volume	59

Total Network Performance

Vehicles Entered	1232
Vehicles Exited	1215
Hourly Exit Rate	1215
Input Volume	5584
% of Volume	22

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	45	86	63	24	16	40	49
Average Queue (ft)	14	26	33	2	1	12	5
95th Queue (ft)	40	66	64	15	8	34	34
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		9	6				0
Queuing Penalty (veh)		5	2				0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	59	97	69	18	74	49	46	3
Average Queue (ft)	20	27	18	1	12	13	16	0
95th Queue (ft)	50	71	54	12	52	40	40	3
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		11	1		0	0		
Queuing Penalty (veh)		3	0		0	2		

Network Summary

Network wide Queuing Penalty: 12

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	10	5	13	64	5	52	3	471	62	38	462	3
Vehicles Exited	9	5	13	58	5	49	3	458	59	36	453	3
Hourly Exit Rate	9	5	13	58	5	49	3	458	59	36	453	3
Input Volume	10	5	15	65	5	55	5	670	85	75	1015	5
% of Volume	88	100	85	89	100	89	60	68	70	48	45	60

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1188
Vehicles Exited	1151
Hourly Exit Rate	1151
Input Volume	2010
% of Volume	57

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	10	5	15	63	6	34	3	503	21	17	519	2
Vehicles Exited	10	5	15	41	4	23	3	492	20	16	509	2
Hourly Exit Rate	10	5	15	41	4	23	3	492	20	16	509	2
Input Volume	10	5	15	75	5	40	5	685	35	40	1125	5
% of Volume	98	100	98	54	80	58	60	72	58	40	45	40

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1198
Vehicles Exited	1140
Hourly Exit Rate	1140
Input Volume	2045
% of Volume	56

Total Network Performance

Vehicles Entered	1338
Vehicles Exited	1241
Hourly Exit Rate	1241
Input Volume	6280
% of Volume	20

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	116	416	58	30	41	32	80
Average Queue (ft)	37	152	36	4	9	13	42
95th Queue (ft)	96	361	70	19	29	34	85
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		68	8				0
Queuing Penalty (veh)		37	5				0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	79	1017	66	29	47	42	41	44
Average Queue (ft)	27	594	40	2	13	9	11	2
95th Queue (ft)	67	1430	87	13	48	31	34	19
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)		17						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		81	32		1	0		
Queuing Penalty (veh)		32	26		0	1		

Network Summary

Network wide Queuing Penalty: 102

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	5	4	13	71	6	42	6	492	39	29	463	7
Vehicles Exited	5	4	13	66	5	37	5	483	38	29	450	7
Hourly Exit Rate	5	4	13	66	5	37	5	483	38	29	450	7
Input Volume	5	5	15	70	5	50	10	949	80	60	860	10
% of Volume	100	80	85	94	100	74	49	51	47	48	52	68

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1177
Vehicles Exited	1142
Hourly Exit Rate	1142
Input Volume	2120
% of Volume	54

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	4	6	9	36	5	45	2	505	19	15	526	4
Vehicles Exited	4	5	9	34	5	44	2	485	18	15	512	4
Hourly Exit Rate	4	5	9	34	5	44	2	485	18	15	512	4
Input Volume	5	5	5	35	5	40	5	990	35	30	950	5
% of Volume	80	100	180	96	100	109	40	49	51	50	54	80

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1176
Vehicles Exited	1137
Hourly Exit Rate	1137
Input Volume	2111
% of Volume	54

Total Network Performance

Vehicles Entered	1291
Vehicles Exited	1217
Hourly Exit Rate	1217
Input Volume	6473
% of Volume	19

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	100	460	54	31	35	31	77
Average Queue (ft)	27	196	31	4	7	11	43
95th Queue (ft)	73	571	68	21	25	31	84
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		73	6				0
Queuing Penalty (veh)		36	4				0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	69	206	75	24	66	47	43	26
Average Queue (ft)	18	94	41	1	21	9	10	1
95th Queue (ft)	54	220	91	12	63	33	32	14
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		53	4		1	0		
Queuing Penalty (veh)		21	1		1	1		

Network Summary

Network wide Queuing Penalty: 66

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	4	7	28	4	59	5	489	30	32	486	8
Vehicles Exited	6	4	7	29	4	59	5	488	30	31	482	7
Hourly Exit Rate	6	4	7	29	4	59	5	488	30	31	482	7
Input Volume	5	5	5	30	5	65	10	1184	80	45	630	10
% of Volume	120	80	140	97	80	91	49	41	37	69	77	68

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1158
Vehicles Exited	1152
Hourly Exit Rate	1152
Input Volume	2075
% of Volume	56

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	14	4	5	30	5	33	5	491	30	36	482	5
Vehicles Exited	14	4	5	29	5	30	5	480	29	36	479	5
Hourly Exit Rate	14	4	5	29	5	30	5	480	29	36	479	5
Input Volume	15	5	5	25	5	30	10	1230	70	45	619	5
% of Volume	92	80	100	117	100	100	49	39	41	80	77	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1140
Vehicles Exited	1121
Hourly Exit Rate	1121
Input Volume	2064
% of Volume	54

Total Network Performance

Vehicles Entered	1257
Vehicles Exited	1231
Hourly Exit Rate	1231
Input Volume	6179
% of Volume	20

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	49	105	64	30	31	49	45
Average Queue (ft)	14	30	38	2	2	10	6
95th Queue (ft)	41	76	63	16	17	34	34
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		14	7			0	0
Queuing Penalty (veh)		9	2			0	0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	73	216	72	27	67	45	52	9
Average Queue (ft)	21	56	25	2	14	12	16	0
95th Queue (ft)	55	195	64	15	53	38	40	5
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		13	9		1	0		
Queuing Penalty (veh)		4	3		1	1		

Network Summary

Network wide Queuing Penalty: 21

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	9	5	18	66	7	66	3	472	60	38	456	2
Vehicles Exited	9	4	17	63	7	63	3	458	59	37	445	2
Hourly Exit Rate	9	4	17	63	7	63	3	458	59	37	445	2
Input Volume	10	5	20	75	5	65	5	740	95	85	1125	5
% of Volume	88	80	84	84	140	97	60	62	62	44	40	40

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1202
Vehicles Exited	1167
Hourly Exit Rate	1167
Input Volume	2235
% of Volume	52

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	12	5	17	77	5	36	3	496	29	16	517	3
Vehicles Exited	12	5	17	56	4	28	4	482	28	16	506	3
Hourly Exit Rate	12	5	17	56	4	28	4	482	28	16	506	3
Input Volume	10	5	20	90	5	45	5	760	40	40	1245	5
% of Volume	117	100	84	62	80	63	80	63	70	40	41	60

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1216
Vehicles Exited	1161
Hourly Exit Rate	1161
Input Volume	2270
% of Volume	51

Total Network Performance

Vehicles Entered	1370
Vehicles Exited	1280
Hourly Exit Rate	1280
Input Volume	6974
% of Volume	18

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	116	552	59	30	40	50	94
Average Queue (ft)	37	269	40	3	8	15	53
95th Queue (ft)	92	599	71	17	29	40	90
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		84	11				1
Queuing Penalty (veh)		55	9				0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	75	866	62	30	62	42	45	33
Average Queue (ft)	28	558	36	2	18	12	10	3
95th Queue (ft)	60	1346	91	16	58	35	34	24
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		88	2		1	0		
Queuing Penalty (veh)		40	2		0	1		

Network Summary

Network wide Queuing Penalty: 107

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	4	4	14	76	5	56	5	491	39	27	453	6
Vehicles Exited	4	4	14	70	5	50	5	482	38	27	443	6
Hourly Exit Rate	4	4	14	70	5	50	5	482	38	27	443	6
Input Volume	5	5	15	80	5	60	10	1058	85	65	955	10
% of Volume	80	80	92	87	100	83	49	46	45	42	46	59

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1180
Vehicles Exited	1148
Hourly Exit Rate	1148
Input Volume	2354
% of Volume	49

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	5	11	44	4	47	2	505	19	13	525	3
Vehicles Exited	6	5	11	41	3	44	2	482	19	13	513	3
Hourly Exit Rate	6	5	11	41	3	44	2	482	19	13	513	3
Input Volume	5	5	10	40	5	45	5	1100	40	30	1050	5
% of Volume	120	100	110	102	60	97	40	44	47	43	49	60

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1184
Vehicles Exited	1142
Hourly Exit Rate	1142
Input Volume	2341
% of Volume	49

Total Network Performance

Vehicles Entered	1305
Vehicles Exited	1231
Hourly Exit Rate	1231
Input Volume	7171
% of Volume	17

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	61	516	56	31	42	60	108
Average Queue (ft)	21	259	35	5	8	11	54
95th Queue (ft)	52	595	72	24	27	39	86
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25	100		80	
Storage Blk Time (%)		86	7				0
Queuing Penalty (veh)		52	6				0

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	68	275	75	17	66	46	30	37
Average Queue (ft)	19	107	39	1	25	8	9	3
95th Queue (ft)	52	267	90	8	68	30	29	20
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		57	4		2	0		
Queuing Penalty (veh)		26	2		1	1		

Network Summary

Network wide Queuing Penalty: 88

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	1	3	18	39	4	956	54	37	529	3	1644
Vehicles Exited	1	3	19	39	4	961	55	38	528	3	1651
Hourly Exit Rate	1	3	19	39	4	961	55	38	528	3	1651
Input Volume	1	1	21	47	5	977	63	36	519	4	1674
% of Volume	100	300	89	83	80	98	87	106	102	75	99

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	9	2	20	2	23	4	983	54	37	513	3	1650
Vehicles Exited	9	2	21	2	23	4	983	53	37	510	3	1647
Hourly Exit Rate	9	2	21	2	23	4	983	53	37	510	3	1647
Input Volume	9	2	18	2	21	5	1015	56	36	506	3	1672
% of Volume	97	100	118	100	111	80	97	95	103	101	100	98

Total Network Performance

Vehicles Entered	1731
Vehicles Exited	1736
Hourly Exit Rate	1736
Input Volume	4973
% of Volume	35

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	30	59	82	68	496	85	215
Average Queue (ft)	3	17	29	6	199	26	55
95th Queue (ft)	18	49	65	35	420	65	146
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)			0		12	1	3
Queuing Penalty (veh)			0		1	4	1

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	58	74	70	49	547	63	84	213
Average Queue (ft)	13	19	17	5	221	25	28	50
95th Queue (ft)	41	53	51	27	463	57	68	148
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		4	1		20	1	0	2
Queuing Penalty (veh)		1	0		12	9	0	1

Network Summary

Network wide Queuing Penalty: 30

1: SR 29 & Rutherford Road Performance by movement

Movement	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	12	68	1	46	2	623	90	63	905	2	1812
Vehicles Exited	12	68	1	47	2	625	91	64	905	2	1817
Hourly Exit Rate	12	68	1	47	2	625	91	64	905	2	1817
Input Volume	10	68	1	52	2	642	87	68	925	2	1857
% of Volume	117	100	100	90	100	97	105	94	98	100	98

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	5	2	16	68	37	0	648	22	33	999	3	1833
Vehicles Exited	5	2	16	68	37	0	643	23	34	987	3	1818
Hourly Exit Rate	5	2	16	68	37	0	643	23	34	987	3	1818
Input Volume	5	2	13	65	35	1	661	22	35	1023	3	1865
% of Volume	100	100	121	105	106	0	97	103	98	96	100	97

Total Network Performance

Vehicles Entered	1974
Vehicles Exited	1972
Hourly Exit Rate	1972
Input Volume	5740
% of Volume	34

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	39	145	101	30	458	104	384
Average Queue (ft)	10	53	30	2	188	46	137
95th Queue (ft)	34	116	73	16	371	93	294
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		2	0		14	3	9
Queuing Penalty (veh)		1	0		0	25	6

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	63	130	75	6	414	51	124	416
Average Queue (ft)	20	44	25	0	158	13	30	178
95th Queue (ft)	52	98	65	5	309	41	81	343
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		14	0		24	0	0	11
Queuing Penalty (veh)		5	0		6	3	0	4

Network Summary

Network wide Queuing Penalty: 49

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	3	1	9	59	0	36	6	894	67	51	766	7
Vehicles Exited	3	1	9	59	0	37	7	906	70	52	765	7
Hourly Exit Rate	3	1	9	59	0	37	7	906	70	52	765	7
Input Volume	3	1	9	58	1	42	6	908	69	51	786	6
% of Volume	100	100	100	102	0	89	117	100	101	102	97	117

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1899
Vehicles Exited	1916
Hourly Exit Rate	1916
Input Volume	1940
% of Volume	99

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	1	2	2	27	1	39	932	32	32	802	2	1872
Vehicles Exited	1	2	2	27	1	40	926	32	32	802	2	1867
Hourly Exit Rate	1	2	2	27	1	40	926	32	32	802	2	1867
Input Volume	2	1	1	28	1	36	945	30	30	824	1	1900
% of Volume	50	200	200	96	100	110	98	106	106	97	200	98

Total Network Performance

Vehicles Entered	1970
Vehicles Exited	1981
Hourly Exit Rate	1981
Input Volume	5787
% of Volume	34

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	44	138	112	43	572	104	358
Average Queue (ft)	12	47	31	8	262	39	125
95th Queue (ft)	37	101	79	31	474	87	263
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		2	0		20	1	9
Queuing Penalty (veh)		1	0		1	9	5

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	T	R	L	TR
Maximum Queue (ft)	30	72	65	486	52	90	327
Average Queue (ft)	5	20	18	193	17	24	103
95th Queue (ft)	22	50	45	390	47	56	247
Link Distance (ft)	519	1400		7093			9777
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50		25	100	
Storage Blk Time (%)		2	1	23	0		5
Queuing Penalty (veh)		1	0	7	4		1

Network Summary

Network wide Queuing Penalty: 29

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	5	6	24	6	46	9	1065	64	40	573	3
Vehicles Exited	6	5	6	24	6	47	10	1066	64	41	572	3
Hourly Exit Rate	6	5	6	24	6	47	10	1066	64	41	572	3
Input Volume	5	5	5	25	5	55	10	1075	70	40	570	5
% of Volume	120	100	120	95	120	85	98	99	91	103	100	60

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1847
Vehicles Exited	1850
Hourly Exit Rate	1850
Input Volume	1870
% of Volume	99

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	13	5	6	27	4	24	9	1099	67	43	558	5
Vehicles Exited	13	5	6	27	4	23	9	1103	66	41	559	5
Hourly Exit Rate	13	5	6	27	4	23	9	1103	66	41	559	5
Input Volume	15	5	5	25	5	25	10	1115	65	40	558	5
% of Volume	85	100	120	109	80	93	88	99	102	102	100	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	1860
Vehicles Exited	1861
Hourly Exit Rate	1861
Input Volume	1873
% of Volume	99

Total Network Performance

Vehicles Entered	1966
Vehicles Exited	1975
Hourly Exit Rate	1975
Input Volume	5584
% of Volume	35

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	56	81	104	94	745	101	314
Average Queue (ft)	17	27	38	14	364	32	95
95th Queue (ft)	45	66	86	53	671	78	230
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		0	1		22	2	7
Queuing Penalty (veh)		0	0		2	9	3

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	69	111	71	80	1797	55	113	256
Average Queue (ft)	24	28	19	13	953	27	34	75
95th Queue (ft)	59	78	57	52	1905	56	79	203
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		10	1		26	1	0	4
Queuing Penalty (veh)		3	0		20	10	1	1

Network Summary

Network wide Queuing Penalty: 49

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	10	5	13	64	5	52	5	682	88	76	993	6
Vehicles Exited	10	5	13	63	5	51	4	689	89	77	997	6
Hourly Exit Rate	10	5	13	63	5	51	4	689	89	77	997	6
Input Volume	10	5	15	65	5	55	5	670	85	75	1015	5
% of Volume	98	100	85	97	100	92	80	103	105	103	98	120

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1999
Vehicles Exited	2009
Hourly Exit Rate	2009
Input Volume	2010
% of Volume	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	10	5	15	77	6	42	5	690	30	39	1095	5
Vehicles Exited	10	5	15	75	6	42	5	694	30	38	1091	5
Hourly Exit Rate	10	5	15	75	6	42	5	694	30	38	1091	5
Input Volume	10	5	15	75	5	40	5	685	35	40	1125	5
% of Volume	98	100	98	100	120	106	100	101	86	96	97	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	2019
Vehicles Exited	2016
Hourly Exit Rate	2016
Input Volume	2045
% of Volume	99

Total Network Performance

Vehicles Entered	2199
Vehicles Exited	2201
Hourly Exit Rate	2201
Input Volume	6280
% of Volume	35

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	62	158	121	86	616	104	877
Average Queue (ft)	25	58	36	7	265	60	267
95th Queue (ft)	58	116	85	39	517	111	620
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		3	0		20	8	16
Queuing Penalty (veh)		2	0		1	77	12

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	95	155	75	30	406	56	124	738
Average Queue (ft)	26	58	32	5	204	16	38	328
95th Queue (ft)	63	116	77	22	376	47	93	652
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		24	1		27	1	1	19
Queuing Penalty (veh)		9	1		11	4	8	8

Network Summary

Network wide Queuing Penalty: 133

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	5	4	13	71	6	42	10	945	78	55	857	12
Vehicles Exited	5	4	13	70	5	41	10	956	78	55	854	11
Hourly Exit Rate	5	4	13	70	5	41	10	956	78	55	854	11
Input Volume	5	5	15	70	5	50	10	949	80	60	860	10
% of Volume	100	80	85	100	100	82	98	101	97	92	99	107

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	2098
Vehicles Exited	2102
Hourly Exit Rate	2102
Input Volume	2120
% of Volume	99

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	4	6	9	36	5	45	3	978	35	30	937	6
Vehicles Exited	4	5	9	36	5	46	3	980	35	31	929	6
Hourly Exit Rate	4	5	9	36	5	46	3	980	35	31	929	6
Input Volume	5	5	5	35	5	40	5	990	35	30	950	5
% of Volume	80	100	180	102	100	114	60	99	99	102	98	120

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	2094
Vehicles Exited	2089
Hourly Exit Rate	2089
Input Volume	2111
% of Volume	99

Total Network Performance

Vehicles Entered	2224
Vehicles Exited	2221
Hourly Exit Rate	2221
Input Volume	6473
% of Volume	34

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	69	137	111	90	902	104	527
Average Queue (ft)	20	60	35	14	447	46	178
95th Queue (ft)	51	112	88	55	854	99	393
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		4	1		26	4	13
Queuing Penalty (veh)		2	1		3	39	8

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	55	97	73	49	642	56	97	439
Average Queue (ft)	16	31	29	4	285	19	28	152
95th Queue (ft)	46	73	66	26	521	51	74	331
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		9	2		27	1		9
Queuing Penalty (veh)		4	1		11	7		3

Network Summary

Network wide Queuing Penalty: 76

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	4	7	28	4	59	8	1109	71	39	623	10
Vehicles Exited	6	4	7	29	4	59	8	1112	69	40	620	10
Hourly Exit Rate	6	4	7	29	4	59	8	1112	69	40	620	10
Input Volume	5	5	5	30	5	65	10	1184	80	45	630	10
% of Volume	120	80	140	97	80	91	78	94	86	89	98	98

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	1968
Vehicles Exited	1968
Hourly Exit Rate	1968
Input Volume	2075
% of Volume	95

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	14	4	5	30	5	33	10	1212	70	45	610	6
Vehicles Exited	15	4	5	30	5	33	10	1141	65	45	611	6
Hourly Exit Rate	15	4	5	30	5	33	10	1141	65	45	611	6
Input Volume	15	5	5	25	5	30	10	1230	70	45	619	5
% of Volume	98	80	100	121	100	110	98	93	93	99	99	120

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	2044
Vehicles Exited	1970
Hourly Exit Rate	1970
Input Volume	2064
% of Volume	95

Total Network Performance

Vehicles Entered	2169
Vehicles Exited	2095
Hourly Exit Rate	2095
Input Volume	6179
% of Volume	34

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	60	120	110	90	836	100	381
Average Queue (ft)	17	34	47	11	418	36	111
95th Queue (ft)	47	83	92	48	769	80	262
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		0	2		24	1	8
Queuing Penalty (veh)		0	1		2	8	4

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	77	106	70	76	4654	50	124	324
Average Queue (ft)	23	30	24	12	2882	25	39	93
95th Queue (ft)	58	77	61	47	5103	53	96	251
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		10	2	0	27	1	1	5
Queuing Penalty (veh)		3	1	0	22	9	6	2

Network Summary

Network wide Queuing Penalty: 58

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	9	5	18	66	7	66	5	745	100	91	1104	5
Vehicles Exited	9	5	17	67	7	66	5	749	101	91	1111	5
Hourly Exit Rate	9	5	17	67	7	66	5	749	101	91	1111	5
Input Volume	10	5	20	75	5	65	5	740	95	85	1125	5
% of Volume	88	100	84	90	140	101	100	101	106	107	99	100

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	2221
Vehicles Exited	2233
Hourly Exit Rate	2233
Input Volume	2235
% of Volume	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	12	5	17	91	6	44	5	768	46	40	1216	6
Vehicles Exited	12	5	17	90	6	43	5	770	44	38	1200	5
Hourly Exit Rate	12	5	17	90	6	43	5	770	44	38	1200	5
Input Volume	10	5	20	90	5	45	5	760	40	40	1245	5
% of Volume	117	100	84	100	120	96	100	101	111	96	96	100

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	2256
Vehicles Exited	2235
Hourly Exit Rate	2235
Input Volume	2270
% of Volume	98

Total Network Performance

Vehicles Entered	2454
Vehicles Exited	2438
Hourly Exit Rate	2438
Input Volume	6974
% of Volume	35

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	94	160	122	109	795	104	1054
Average Queue (ft)	27	59	48	9	315	68	466
95th Queue (ft)	69	118	100	50	636	120	961
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		4	1		25	14	20
Queuing Penalty (veh)		3	1		1	154	17

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	76	199	75	68	575	52	124	2130
Average Queue (ft)	33	82	33	6	253	21	38	1108
95th Queue (ft)	68	160	81	30	479	50	93	2319
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		33	2		28	1	1	27
Queuing Penalty (veh)		15	2		13	6	9	11

Network Summary

Network wide Queuing Penalty: 230

1: SR 29 & Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	4	4	16	70	6	56	10	1048	84	60	946	12
Vehicles Exited	4	4	16	72	6	56	9	1027	79	60	948	12
Hourly Exit Rate	4	4	16	72	6	56	9	1027	79	60	948	12
Input Volume	5	5	15	80	5	60	10	1058	85	65	955	10
% of Volume	80	80	105	90	120	93	88	97	93	92	99	117

1: SR 29 & Rutherford Road Performance by movement

Movement	All
Vehicles Entered	2316
Vehicles Exited	2293
Hourly Exit Rate	2293
Input Volume	2354
% of Volume	97

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	6	11	46	4	49	5	1076	40	31	1026	7
Vehicles Exited	6	5	11	45	3	49	4	1083	40	31	1021	7
Hourly Exit Rate	6	5	11	45	3	49	4	1083	40	31	1021	7
Input Volume	5	5	10	40	5	45	5	1100	40	30	1050	5
% of Volume	120	100	110	112	60	108	80	98	99	102	97	140

2: SR 29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Vehicles Entered	2307
Vehicles Exited	2305
Hourly Exit Rate	2305
Input Volume	2341
% of Volume	98

Total Network Performance

Vehicles Entered	2447
Vehicles Exited	2423
Hourly Exit Rate	2423
Input Volume	7171
% of Volume	34

Intersection: 1: SR 29 & Rutherford Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	53	193	122	101	1535	104	556
Average Queue (ft)	21	65	46	15	807	52	218
95th Queue (ft)	49	129	97	59	1565	99	463
Link Distance (ft)	1461	3068			9777		3608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100	100		80	
Storage Blk Time (%)		4	0		31	5	15
Queuing Penalty (veh)		2	0		3	46	10

Intersection: 2: SR 29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	72	116	74	34	921	50	106	491
Average Queue (ft)	19	40	33	5	409	18	28	198
95th Queue (ft)	53	93	74	24	786	46	75	414
Link Distance (ft)	519	1400			7093			9777
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	100		25	100	
Storage Blk Time (%)		14	4		27	1	0	12
Queuing Penalty (veh)		7	2		12	6	2	4

Network Summary

Network wide Queuing Penalty: 94

Appendix D – Sidra LOS Reports

LANE SUMMARY

Site: 101 [Existing AM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	997	7.0	1235	0.807	100	4.9	LOS A	14.1	372.9	Full	1600	0.0	0.0
Approach	997	7.0		0.807		4.9	LOS A	14.1	372.9				
East: WB Rutherford Rd													
Lane 1[d]	73	7.0	458	0.159	100	14.2	LOS B	1.1	27.8	Full	1600	0.0	0.0
Approach	73	7.0		0.159		14.2	LOS B	1.1	27.8				
North: SB SR 29													
Lane 1[d]	588	7.0	1245	0.473	100	4.5	LOS A	4.4	115.2	Full	1600	0.0	0.0
Approach	588	7.0		0.473		4.5	LOS A	4.4	115.2				
West: EB Rutherford Rd													
Lane 1[d]	3	7.0	739	0.004	100	9.5	LOS A	0.0	0.6	Full	1600	0.0	0.0
Approach	3	7.0		0.004		9.5	LOS A	0.0	0.6				
Intersection	1661	7.0		0.807		5.2	LOS A	14.1	372.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	925	66	997	7.0	1235	0.807	100	NA	NA
Approach	5	925	66	997	7.0		0.807			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	1	49	73	7.0	458	0.159	100	NA	NA
Approach	22	1	49	73	7.0		0.159			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	38	546	4	588	7.0	1245	0.473	100	NA	NA
Approach	38	546	4	588	7.0		0.473			

West: EB Rutherford Rd										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1	1	3	7.0	739	0.004	100	NA	NA
Approach	1	1	1	3	7.0		0.004			

	Total	%HV	Deg.Satn (v/c)
Intersection	1661	7.0	0.807

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Existing PM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	778	4.0	1210	0.643	100	4.8	LOS A	7.7	199.1	Full	1600	0.0	0.0
Approach	778	4.0		0.643		4.8	LOS A	7.7	199.1				
East: WB Rutherford Rd													
Lane 1 [d]	129	4.0	674	0.191	100	11.9	LOS B	1.2	31.0	Full	1600	0.0	0.0
Approach	129	4.0		0.191		11.9	LOS B	1.2	31.0				
North: SB SR 29													
Lane 1 [d]	1059	4.0	1214	0.872	100	6.1	LOS A	18.7	482.6	Full	1600	0.0	0.0
Approach	1059	4.0		0.872		6.1	LOS A	18.7	482.6				
West: EB Rutherford Rd													
Lane 1 [d]	13	4.0	297	0.043	100	16.3	LOS B	0.3	8.0	Full	1600	0.0	0.0
Approach	13	4.0		0.043		16.3	LOS B	0.3	8.0				
Intersection	1978	4.0		0.872		6.0	LOS A	18.7	482.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	2	683	93	778	4.0	1210	0.643	100	NA	NA
Approach	2	683	93	778	4.0		0.643			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	72	1	55	129	4.0	674	0.191	100	NA	NA
Approach	72	1	55	129	4.0		0.191			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	72	984	2	1059	4.0	1214	0.872	100	NA	NA
Approach	72	984	2	1059	4.0		0.872			

West: EB Rutherford Rd

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1	11	13	4.0	297	0.043	100	NA	NA
Approach	1	1	11	13	4.0		0.043			

	Total	%HV	Deg.Satn (v/c)
Intersection	1978	4.0	0.872

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Existing Weekend (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	980	2.0	1272	0.771	100	4.9	LOS A	12.1	307.8	Full	1600	0.0	0.0
Approach	980	2.0		0.771		4.9	LOS A	12.1	307.8				
East: WB Rutherford Rd													
Lane 1[d]	106	2.0	532	0.200	100	14.4	LOS B	1.4	34.8	Full	1600	0.0	0.0
Approach	106	2.0		0.200		14.4	LOS B	1.4	34.8				
North: SB SR 29													
Lane 1[d]	887	2.0	1250	0.710	100	5.1	LOS A	9.8	248.9	Full	1600	0.0	0.0
Approach	887	2.0		0.710		5.1	LOS A	9.8	248.9				
West: EB Rutherford Rd													
Lane 1[d]	14	2.0	522	0.026	100	12.1	LOS B	0.2	4.3	Full	1600	0.0	0.0
Approach	14	2.0		0.026		12.1	LOS B	0.2	4.3				
Intersection	1987	2.0		0.771		5.5	LOS A	12.1	307.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	6	901	73	980	2.0	1272	0.771	100	NA	NA
Approach	6	901	73	980	2.0		0.771			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	61	1	44	106	2.0	532	0.200	100	NA	NA
Approach	61	1	44	106	2.0		0.200			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	54	827	6	887	2.0	1250	0.710	100	NA	NA
Approach	54	827	6	887	2.0		0.710			
West: EB Rutherford Rd										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	3	1	9	14	2.0	522	0.026	100	NA	NA
Approach	3	1	9	14	2.0		0.026			

	Total	%HV	Deg.Satn (v/c)
Intersection	1987	2.0	0.771

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2025 AM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	1045	7.0	1314	0.795	100	4.9	LOS A	12.8	338.2	Full	1600	0.0	0.0
Approach	1045	7.0		0.795		4.9	LOS A	12.8	338.2				
East: WB Rutherford Rd													
Lane 1 [d]	85	7.0	427	0.199	100	15.3	LOS B	1.3	35.6	Full	1600	0.0	0.0
Approach	85	7.0		0.199		15.3	LOS B	1.3	35.6				
North: SB SR 29													
Lane 1 [d]	615	7.0	1311	0.469	100	4.6	LOS A	4.2	111.9	Full	1600	0.0	0.0
Approach	615	7.0		0.469		4.6	LOS A	4.2	111.9				
West: EB Rutherford Rd													
Lane 1 [d]	15	7.0	714	0.021	100	9.9	LOS A	0.1	3.0	Full	1600	0.0	0.0
Approach	15	7.0		0.021		9.9	LOS A	0.1	3.0				
Intersection	1760	7.0		0.795		5.3	LOS A	12.8	338.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	965	70	1045	7.0	1314	0.795	100	NA	NA
Approach	10	965	70	1045	7.0		0.795			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	5	55	85	7.0	427	0.199	100	NA	NA
Approach	25	5	55	85	7.0		0.199			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	40	570	5	615	7.0	1311	0.469	100	NA	NA
Approach	40	570	5	615	7.0		0.469			

West: EB Rutherford Rd

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	5	5	15	7.0	714	0.021	100	NA	NA
Approach	5	5	5	15	7.0		0.021			

	Total	%HV	Deg.Satn (v/c)
Intersection	1760	7.0	0.795

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2025 PM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	760	4.0	1258	0.604	100	4.8	LOS A	6.4	164.0	Full	1600	0.0	0.0
Approach	760	4.0		0.604		4.8	LOS A	6.4	164.0				
East: WB Rutherford Rd													
Lane 1 [d]	125	4.0	681	0.184	100	11.6	LOS B	1.1	29.5	Full	1600	0.0	0.0
Approach	125	4.0		0.184		11.6	LOS B	1.1	29.5				
North: SB SR 29													
Lane 1 [d]	1095	4.0	1296	0.845	100	5.8	LOS A	16.5	425.5	Full	1600	0.0	0.0
Approach	1095	4.0		0.845		5.8	LOS A	16.5	425.5				
West: EB Rutherford Rd													
Lane 1 [d]	30	4.0	305	0.098	100	18.5	LOS B	0.7	18.2	Full	1600	0.0	0.0
Approach	30	4.0		0.098		18.5	LOS B	0.7	18.2				
Intersection	2010	4.0		0.845		6.0	LOS A	16.5	425.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	670	85	760	4.0	1258	0.604	100	NA	NA
Approach	5	670	85	760	4.0		0.604			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	5	55	125	4.0	681	0.184	100	NA	NA
Approach	65	5	55	125	4.0		0.184			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	75	1015	5	1095	4.0	1296	0.845	100	NA	NA
Approach	75	1015	5	1095	4.0		0.845			

West: EB Rutherford Rd

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	5	15	30	4.0	305	0.098	100	NA	NA
Approach	10	5	15	30	4.0		0.098			

	Total	%HV	Deg.Satn (v/c)
Intersection	2010	4.0	0.845

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [2025 Weekend (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	1030	2.0	1338	0.770	100	4.9	LOS A	11.7	296.8	Full	1600	0.0	0.0
Approach	1030	2.0		0.770		4.9	LOS A	11.7	296.8				
East: WB Rutherford Rd													
Lane 1[d]	125	2.0	495	0.253	100	15.2	LOS B	1.8	45.1	Full	1600	0.0	0.0
Approach	125	2.0		0.253		15.2	LOS B	1.8	45.1				
North: SB SR 29													
Lane 1[d]	930	2.0	1298	0.716	100	5.3	LOS A	9.8	247.9	Full	1600	0.0	0.0
Approach	930	2.0		0.716		5.3	LOS A	9.8	247.9				
West: EB Rutherford Rd													
Lane 1[d]	25	2.0	479	0.052	100	12.8	LOS B	0.3	8.8	Full	1600	0.0	0.0
Approach	25	2.0		0.052		12.8	LOS B	0.3	8.8				
Intersection	2110	2.0		0.770		5.8	LOS A	11.7	296.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	940	80	1030	2.0	1338	0.770	100	NA	NA
Approach	10	940	80	1030	2.0		0.770			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	70	5	50	125	2.0	495	0.253	100	NA	NA
Approach	70	5	50	125	2.0		0.253			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	60	860	10	930	2.0	1298	0.716	100	NA	NA
Approach	60	860	10	930	2.0		0.716			

West: EB Rutherford Rd

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	5	15	25	2.0	479	0.052	100	NA	NA
Approach	5	5	15	25	2.0		0.052			

	Total	%HV	Deg.Satn (v/c)
Intersection	2110	2.0	0.770

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2035 AM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	1160	7.0	1470	0.789	100	4.8	LOS A	12.4	326.1	Full	1600	0.0	0.0
Approach	1160	7.0		0.789		4.8	LOS A	12.4	326.1				
East: WB Rutherford Rd													
Lane 1 [d]	100	7.0	401	0.249	100	17.6	LOS B	1.8	47.5	Full	1600	0.0	0.0
Approach	100	7.0		0.249		17.6	LOS B	1.8	47.5				
North: SB SR 29													
Lane 1 [d]	685	7.0	1451	0.472	100	4.6	LOS A	4.4	116.1	Full	1600	0.0	0.0
Approach	685	7.0		0.472		4.6	LOS A	4.4	116.1				
West: EB Rutherford Rd													
Lane 1 [d]	15	7.0	719	0.021	100	10.2	LOS B	0.1	3.1	Full	1600	0.0	0.0
Approach	15	7.0		0.021		10.2	LOS B	0.1	3.1				
Intersection	1960	7.0		0.789		5.4	LOS A	12.4	326.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	1070	80	1160	7.0	1470	0.789	100	NA	NA
Approach	10	1070	80	1160	7.0		0.789			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	30	5	65	100	7.0	401	0.249	100	NA	NA
Approach	30	5	65	100	7.0		0.249			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	45	630	10	685	7.0	1451	0.472	100	NA	NA
Approach	45	630	10	685	7.0		0.472			

West: EB Rutherford Rd

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	5	5	15	7.0	719	0.021	100	NA	NA
Approach	5	5	5	15	7.0		0.021			

	Total	%HV	Deg.Satn (v/c)
Intersection	1960	7.0	0.789

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [2035 PM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: NB SR 29													
Lane 1[d]	840	4.0	1375	0.611	100	4.7	LOS A	6.5	168.4	Full	1600	0.0	0.0
Approach	840	4.0		0.611		4.7	LOS A	6.5	168.4				
East: WB Rutherford Rd													
Lane 1[d]	145	4.0	680	0.213	100	12.1	LOS B	1.4	36.5	Full	1600	0.0	0.0
Approach	145	4.0		0.213		12.1	LOS B	1.4	36.5				
North: SB SR 29													
Lane 1[d]	1215	4.0	1429	0.850	100	5.7	LOS A	17.1	440.5	Full	1600	0.0	0.0
Approach	1215	4.0		0.850		5.7	LOS A	17.1	440.5				
West: EB Rutherford Rd													
Lane 1[d]	35	4.0	259	0.135	100	22.9	LOS C	1.0	27.0	Full	1600	0.0	0.0
Approach	35	4.0		0.135		22.9	LOS C	1.0	27.0				
Intersection	2235	4.0		0.850		6.0	LOS A	17.1	440.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	740	95	840	4.0	1375	0.611	100	NA	NA
Approach	5	740	95	840	4.0		0.611			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	75	5	65	145	4.0	680	0.213	100	NA	NA
Approach	75	5	65	145	4.0		0.213			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	85	1125	5	1215	4.0	1429	0.850	100	NA	NA
Approach	85	1125	5	1215	4.0		0.850			
West: EB Rutherford Rd										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	5	20	35	4.0	259	0.135	100	NA	NA
Approach	10	5	20	35	4.0		0.135			

	Total	%HV	Deg.Satn (v/c)
Intersection	2235	4.0	0.850

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [2035 Weekend (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	1135	2.0	1489	0.762	100	4.8	LOS A	11.3	287.1	Full	1600	0.0	0.0
Approach	1135	2.0		0.762		4.8	LOS A	11.3	287.1				
East: WB Rutherford Rd													
Lane 1[d]	145	2.0	476	0.305	100	16.7	LOS B	2.3	58.1	Full	1600	0.0	0.0
Approach	145	2.0		0.305		16.7	LOS B	2.3	58.1				
North: SB SR 29													
Lane 1[d]	1030	2.0	1424	0.723	100	5.2	LOS A	10.1	255.4	Full	1600	0.0	0.0
Approach	1030	2.0		0.723		5.2	LOS A	10.1	255.4				
West: EB Rutherford Rd													
Lane 1[d]	25	2.0	443	0.056	100	14.5	LOS B	0.4	10.3	Full	1600	0.0	0.0
Approach	25	2.0		0.056		14.5	LOS B	0.4	10.3				
Intersection	2335	2.0		0.762		5.8	LOS A	11.3	287.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	1040	85	1135	2.0	1489	0.762	100	NA	NA
Approach	10	1040	85	1135	2.0		0.762			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	80	5	60	145	2.0	476	0.305	100	NA	NA
Approach	80	5	60	145	2.0		0.305			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	65	955	10	1030	2.0		1424	0.723	100	NA	NA
Approach	65	955	10	1030	2.0			0.723			

West: EB Rutherford Rd											
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	5	15	25	2.0		443	0.056	100	NA	NA
Approach	5	5	15	25	2.0			0.056			

	Total	%HV	Deg.Satn (v/c)
Intersection	2335	2.0	0.762

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [Existing AM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	1170	8.0	1210	0.967	100	8.2	LOS A	42.4	1128.5	Full	1600	0.0	0.0
Approach	1170	8.0		0.967		8.2	LOS A	42.4	1128.5				
East: WB Oakville Cross Rd													
Lane 1[d]	45	8.0	240	0.186	100	22.1	LOS C	1.4	36.2	Full	1600	0.0	0.0
Approach	45	8.0		0.186		22.1	LOS C	1.4	36.2				
North: SB SR 29													
Lane 1[d]	554	8.0	1233	0.450	100	4.5	LOS A	4.1	108.6	Full	1600	0.0	0.0
Approach	554	8.0		0.450		4.5	LOS A	4.1	108.6				
West: EB Walnut Ln													
Lane 1[d]	13	8.0	749	0.017	100	11.9	LOS B	0.1	2.4	Full	1600	0.0	0.0
Approach	13	8.0		0.017		11.9	LOS B	0.1	2.4				
Intersection	1782	8.0		0.967		7.5	LOS A	42.4	1128.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	1103	61	1170	8.0	1210	0.967	100	NA	NA
Approach	5	1103	61	1170	8.0		0.967			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	20	2	23	45	8.0	240	0.186	100	NA	NA
Approach	20	2	23	45	8.0		0.186			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	39	512	3	554	8.0	1233	0.450	100	NA	NA
Approach	39	512	3	554	8.0		0.450			

West: EB Walnut Ln

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	1	2	13	8.0	749	0.017	100	NA	NA
Approach	10	1	2	13	8.0		0.017			

	Total	%HV	Deg.Satn (v/c)
Intersection	1782	8.0	0.967

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Walnut Ln Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [Existing PM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	720	4.0	1257	0.573	100	4.3	LOS A	6.3	162.5	Full	1600	0.0	0.0
Approach	720	4.0		0.573		4.3	LOS A	6.3	162.5				
East: WB Oakville Cross Rd													
Lane 1 [d]	106	4.0	692	0.154	100	12.5	LOS B	0.9	23.8	Full	1600	0.0	0.0
Approach	106	4.0		0.154		12.5	LOS B	0.9	23.8				
North: SB SR 29													
Lane 1 [d]	1120	4.0	1221	0.917	100	6.3	LOS A	24.6	634.8	Full	1600	0.0	0.0
Approach	1120	4.0		0.917		6.3	LOS A	24.6	634.8				
West: EB Walnut Ln													
Lane 1 [d]	21	4.0	252	0.083	100	20.3	LOS C	0.6	15.9	Full	1600	0.0	0.0
Approach	21	4.0		0.083		20.3	LOS C	0.6	15.9				
Intersection	1967	4.0		0.917		6.1	LOS A	24.6	634.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	696	23	720	4.0	1257	0.573	100	NA	NA
Approach	1	696	23	720	4.0		0.573			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	68	1	37	106	4.0	692	0.154	100	NA	NA
Approach	68	1	37	106	4.0		0.154			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	37	1080	3	1120	4.0	1221	0.917	100	NA	NA
Approach	37	1080	3	1120	4.0		0.917			
West: EB Walnut Ln										
Lane 1	5	2	14	21	4.0	252	0.083	100	NA	NA
Approach	5	2	14	21	4.0		0.083			

	Total	%HV	Deg.Satn (v/c)
Intersection	1967	4.0	0.917

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Walnut Ln Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [Existing Weekend (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	1006	2.0	1307	0.770	100	4.5	LOS A	12.4	314.9	Full	1600	0.0	0.0
Approach	1006	2.0		0.770		4.5	LOS A	12.4	314.9				
East: WB Rutherford Rd													
Lane 1[d]	67	2.0	518	0.129	100	14.4	LOS B	0.9	21.7	Full	1600	0.0	0.0
Approach	67	2.0		0.129		14.4	LOS B	0.9	21.7				
North: SB SR 29													
Lane 1[d]	876	2.0	1304	0.672	100	4.4	LOS A	9.4	238.4	Full	1600	0.0	0.0
Approach	876	2.0		0.672		4.4	LOS A	9.4	238.4				
West: EB Rutherford Rd													
Lane 1[d]	4	2.0	586	0.007	100	12.9	LOS B	0.0	1.1	Full	1600	0.0	0.0
Approach	4	2.0		0.007		12.9	LOS B	0.0	1.1				
Intersection	1954	2.0		0.770		4.8	LOS A	12.4	314.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	974	31	1006	2.0	1307	0.770	100	NA	NA
Approach	1	974	31	1006	2.0		0.770			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	29	1	37	67	2.0	518	0.129	100	NA	NA
Approach	29	1	37	67	2.0		0.129			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	31	844	1	876	2.0	1304	0.672	100	NA	NA
Approach	31	844	1	876	2.0		0.672			

West: EB Rutherford Rd

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	2	1	1	4	2.0	586	0.007	100	NA	NA
Approach	2	1	1	4	2.0		0.007			

	Total	%HV	Deg.Satn (v/c)
Intersection	1954	2.0	0.770

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Rutherford Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [2025 AM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1[d]	1190	8.0	1285	0.926	100	6.2	LOS A	26.3	699.0	Full	1600	0.0	0.0
Approach	1190	8.0		0.926		6.2	LOS A	26.3	699.0				
East: WB Oakville Cross Rd													
Lane 1[d]	55	8.0	230	0.239	100	23.2	LOS C	1.8	47.0	Full	1600	0.0	0.0
Approach	55	8.0		0.239		23.2	LOS C	1.8	47.0				
North: SB SR 29													
Lane 1[d]	565	8.0	1294	0.437	100	4.6	LOS A	3.8	101.5	Full	1600	0.0	0.0
Approach	565	8.0		0.437		4.6	LOS A	3.8	101.5				
West: EB Walnut Ln													
Lane 1[d]	25	8.0	735	0.034	100	11.2	LOS B	0.2	4.8	Full	1600	0.0	0.0
Approach	25	8.0		0.034		11.2	LOS B	0.2	4.8				
Intersection	1835	8.0		0.926		6.3	LOS A	26.3	699.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	1115	65	1190	8.0	1285	0.926	100	NA	NA
Approach	10	1115	65	1190	8.0		0.926			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	5	25	55	8.0	230	0.239	100	NA	NA
Approach	25	5	25	55	8.0		0.239			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	520	5	565	8.0	1294	0.437	100	NA	NA
Approach	40	520	5	565	8.0		0.437			
West: EB Walnut Ln										
Lane 1	15	5	5	25	8.0	735	0.034	100	NA	NA
Approach	15	5	5	25	8.0		0.034			

	Total	%HV	Deg.Satn (v/c)
Intersection	1835	8.0	0.926

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Walnut Ln Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2025 PM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	725	4.0	1322	0.548	100	4.4	LOS A	5.6	144.1	Full	1600	0.0	0.0
Approach	725	4.0		0.548		4.4	LOS A	5.6	144.1				
East: WB Oakville Cross Rd													
Lane 1 [d]	120	4.0	693	0.173	100	12.4	LOS B	1.0	27.0	Full	1600	0.0	0.0
Approach	120	4.0		0.173		12.4	LOS B	1.0	27.0				
North: SB SR 29													
Lane 1 [d]	1170	4.0	1279	0.915	100	6.3	LOS A	22.8	589.1	Full	1600	0.0	0.0
Approach	1170	4.0		0.915		6.3	LOS A	22.8	589.1				
West: EB Walnut Ln													
Lane 1 [d]	30	4.0	225	0.133	100	23.2	LOS C	1.0	25.8	Full	1600	0.0	0.0
Approach	30	4.0		0.133		23.2	LOS C	1.0	25.8				
Intersection	2045	4.0		0.915		6.2	LOS A	22.8	589.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	685	35	725	4.0	1322	0.548	100	NA	NA
Approach	5	685	35	725	4.0		0.548			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	75	5	40	120	4.0	693	0.173	100	NA	NA
Approach	75	5	40	120	4.0		0.173			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	40	1125	5	1170	4.0	1279	0.915	100	NA	NA
Approach	40	1125	5	1170	4.0		0.915			

West: EB Walnut Ln										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	5	15	30	4.0	225	0.133	100	NA	NA
Approach	10	5	15	30	4.0		0.133			

	Total	%HV	Deg.Satn (v/c)
Intersection	2045	4.0	0.915

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Walnut Ln Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [2025 Weekend (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	1030	2.0	1404	0.734	100	4.4	LOS A	10.4	263.7	Full	1600	0.0	0.0
Approach	1030	2.0		0.734		4.4	LOS A	10.4	263.7				
East: WB Rutherford Rd													
Lane 1 [d]	80	2.0	511	0.157	100	14.9	LOS B	1.0	26.5	Full	1600	0.0	0.0
Approach	80	2.0		0.157		14.9	LOS B	1.0	26.5				
North: SB SR 29													
Lane 1 [d]	985	2.0	1383	0.712	100	4.6	LOS A	10.5	267.1	Full	1600	0.0	0.0
Approach	985	2.0		0.712		4.6	LOS A	10.5	267.1				
West: EB Rutherford Rd													
Lane 1 [d]	15	2.0	493	0.030	100	13.9	LOS B	0.2	5.0	Full	1600	0.0	0.0
Approach	15	2.0		0.030		13.9	LOS B	0.2	5.0				
Intersection	2110	2.0		0.734		5.0	LOS A	10.5	267.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	990	35	1030	2.0	1404	0.734	100	NA	NA
Approach	5	990	35	1030	2.0		0.734			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	35	5	40	80	2.0	511	0.157	100	NA	NA
Approach	35	5	40	80	2.0		0.157			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	30	950	5	985	2.0	1383	0.712	100	NA	NA
Approach	30	950	5	985	2.0		0.712			
West: EB Rutherford Rd										
Lane 1	5	5	5	15	2.0	493	0.030	100	NA	NA
Approach	5	5	5	15	2.0		0.030			

	Total	%HV	Deg.Satn (v/c)
Intersection	2110	2.0	0.734

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2035 AM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 d	1310	8.0	1438	0.911	100	5.7	LOS A	23.9	636.2	Full	1600	0.0	0.0
Approach	1310	8.0		0.911		5.7	LOS A	23.9	636.2				
East: WB Oakville Cross Rd													
Lane 1 d	60	8.0	212	0.284	100	26.0	LOS C	2.2	58.8	Full	1600	0.0	0.0
Approach	60	8.0		0.284		26.0	LOS C	2.2	58.8				
North: SB SR 29													
Lane 1 d	625	8.0	1446	0.432	100	4.6	LOS A	3.8	101.5	Full	1600	0.0	0.0
Approach	625	8.0		0.432		4.6	LOS A	3.8	101.5				
West: EB Walnut Ln													
Lane 1 d	25	8.0	752	0.033	100	11.4	LOS B	0.2	4.9	Full	1600	0.0	0.0
Approach	25	8.0		0.033		11.4	LOS B	0.2	4.9				
Intersection	2020	8.0		0.911		6.0	LOS A	23.9	636.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	1230	70	1310	8.0	1438	0.911	100	NA	NA
Approach	10	1230	70	1310	8.0		0.911			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	5	30	60	8.0	212	0.284	100	NA	NA
Approach	25	5	30	60	8.0		0.284			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	45	575	5	625	8.0	1446	0.432	100	NA	NA
Approach	45	575	5	625	8.0		0.432			
West: EB Walnut Ln										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	15	5	5	25	8.0	752	0.033	100	NA	NA
Approach	15	5	5	25	8.0		0.033			

	Total	%HV	Deg.Satn (v/c)
Intersection	2020	8.0	0.911

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Walnut Ln Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2035 PM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: NB SR 29													
Lane 1[d]	805	4.0	1478	0.545	100	4.3	LOS A	5.6	144.3	Full	1600	0.0	0.0
Approach	805	4.0		0.545		4.3	LOS A	5.6	144.3				
East: WB Oakville Cross Rd													
Lane 1[d]	140	4.0	699	0.200	100	13.0	LOS B	1.3	33.1	Full	1600	0.0	0.0
Approach	140	4.0		0.200		13.0	LOS B	1.3	33.1				
North: SB SR 29													
Lane 1[d]	1290	4.0	1401	0.921	100	6.2	LOS A	23.4	605.0	Full	1600	0.0	0.0
Approach	1290	4.0		0.921		6.2	LOS A	23.4	605.0				
West: EB Walnut Ln													
Lane 1[d]	35	4.0	179	0.196	100	30.1	LOS C	1.6	40.8	Full	1600	0.0	0.0
Approach	35	4.0		0.196		30.1	LOS C	1.6	40.8				
Intersection	2270	4.0		0.921		6.3	LOS A	23.4	605.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	760	40	805	4.0	1478	0.545	100	NA	NA
Approach	5	760	40	805	4.0		0.545			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	90	5	45	140	4.0	699	0.200	100	NA	NA
Approach	90	5	45	140	4.0		0.200			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	40	1245	5	1290	4.0	1401	0.921	100	NA	NA
Approach	40	1245	5	1290	4.0		0.921			

West: EB Walnut Ln

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	5	20	35	4.0	179	0.196	100	NA	NA
Approach	10	5	20	35	4.0		0.196			

	Total	%HV	Deg.Satn (v/c)
Intersection	2270	4.0	0.921

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Walnut Ln Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [2035 Weekend (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	1145	2.0	1589	0.721	100	4.3	LOS A	9.7	247.5	Full	1600	0.0	0.0
Approach	1145	2.0		0.721		4.3	LOS A	9.7	247.5				
East: WB Rutherford Rd													
Lane 1 [d]	90	2.0	492	0.183	100	16.9	LOS B	1.3	33.0	Full	1600	0.0	0.0
Approach	90	2.0		0.183		16.9	LOS B	1.3	33.0				
North: SB SR 29													
Lane 1 [d]	1085	2.0	1543	0.703	100	4.5	LOS A	10.2	259.2	Full	1600	0.0	0.0
Approach	1085	2.0		0.703		4.5	LOS A	10.2	259.2				
West: EB Rutherford Rd													
Lane 1 [d]	20	2.0	468	0.043	100	15.2	LOS B	0.3	7.6	Full	1600	0.0	0.0
Approach	20	2.0		0.043		15.2	LOS B	0.3	7.6				
Intersection	2340	2.0		0.721		5.0	LOS A	10.2	259.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	1100	40	1145	2.0	1589	0.721	100	NA	NA
Approach	5	1100	40	1145	2.0		0.721			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	5	45	90	2.0	492	0.183	100	NA	NA
Approach	40	5	45	90	2.0		0.183			

North: SB SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	30	1050	5	1085	2.0	1543	0.703	100	NA	NA
Approach	30	1050	5	1085	2.0		0.703			
West: EB Rutherford Rd										
Lane 1	5	5	10	20	2.0	468	0.043	100	NA	NA
Approach	5	5	10	20	2.0		0.043			

	Total	%HV	Deg.Satn (v/c)
Intersection	2340	2.0	0.721

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Existing AM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout
Design Life Analysis (Practical Capacity): Results for 12 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	1235	8.0	1466	0.842	100	5.0	LOS A	16.2	429.6	Full	1600	0.0	0.0
Approach	1235	8.0		0.842		5.0	LOS A	16.2	429.6				
East: WB Oakville Cross Rd													
Lane 1 [d]	47	8.0	311	0.151	100	21.9	LOS C	1.1	29.4	Full	1600	0.0	0.0
Approach	47	8.0		0.151		21.9	LOS C	1.1	29.4				
North: SB SR 29													
Lane 1 [d]	585	8.0	1483	0.395	100	4.5	LOS A	3.4	90.6	Full	1600	0.0	0.0
Approach	585	8.0		0.395		4.5	LOS A	3.4	90.6				
West: EB Walnut Ln													
Lane 1 [d]	14	8.0	790	0.017	100	11.8	LOS B	0.1	2.5	Full	1600	0.0	0.0
Approach	14	8.0		0.017		11.8	LOS B	0.1	2.5				
Intersection	1881	8.0		0.842		5.3	LOS A	16.2	429.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	6	1165	64	1235	8.0	1466	0.842	100	NA	NA
Approach	6	1165	64	1235	8.0		0.842			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	21	2	24	47	8.0	311	0.151	100	NA	NA
Approach	21	2	24	47	8.0		0.151			

North: SB SR 29

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	41	541	3	585	8.0	1483	0.395	100	NA	NA
Approach	41	541	3	585	8.0		0.395			
West: EB Walnut Ln										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	1	2	14	8.0	790	0.017	100	NA	NA
Approach	10	1	2	14	8.0		0.017			

	Total	%HV	Deg.Satn (v/c)
Intersection	1881	8.0	0.842

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Walnut Ln Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [Existing PM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout
Design Life Analysis (Practical Capacity): Results for 12 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	785	4.0	1499	0.524	100	4.2	LOS A	5.1	132.3	Full	1600	0.0	0.0
Approach	785	4.0		0.524		4.2	LOS A	5.1	132.3				
East: WB Oakville Cross Rd													
Lane 1 [d]	116	4.0	714	0.162	100	12.8	LOS B	1.0	26.1	Full	1600	0.0	0.0
Approach	116	4.0		0.162		12.8	LOS B	1.0	26.1				
North: SB SR 29													
Lane 1 [d]	1221	4.0	1449	0.843	100	5.3	LOS A	17.0	438.4	Full	1600	0.0	0.0
Approach	1221	4.0		0.843		5.3	LOS A	17.0	438.4				
West: EB Walnut Ln													
Lane 1 [d]	23	4.0	263	0.087	100	22.8	LOS C	0.7	17.2	Full	1600	0.0	0.0
Approach	23	4.0		0.087		22.8	LOS C	0.7	17.2				
Intersection	2145	4.0		0.843		5.5	LOS A	17.0	438.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	759	25	785	4.0	1499	0.524	100	NA	NA
Approach	1	759	25	785	4.0		0.524			

East: WB Oakville Cross Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	75	1	40	116	4.0	714	0.162	100	NA	NA
Approach	75	1	40	116	4.0		0.162			

North: SB SR 29

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	40	1177	3	1221	4.0	1449	0.843	100	NA	NA
Approach	40	1177	3	1221	4.0		0.843			

West: EB Walnut Ln

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	6	2	15	23	4.0	263	0.087	100	NA	NA
Approach	6	2	15	23	4.0		0.087			

	Total	%HV	Deg.Satn (v/c)
Intersection	2145	4.0	0.843

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: WB Oakville Cross Rd Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: SB SR 29 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: EB Walnut Ln Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [Existing Weekend (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout
Design Life Analysis (Practical Capacity): Results for 15 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB SR 29													
Lane 1 [d]	1192	2.0	1591	0.749	100	4.3	LOS A	11.1	281.2	Full	1600	0.0	0.0
Approach	1192	2.0		0.749		4.3	LOS A	11.1	281.2				
East: WB Rutherford Rd													
Lane 1 [d]	79	2.0	453	0.175	100	18.0	LOS B	1.3	32.2	Full	1600	0.0	0.0
Approach	79	2.0		0.175		18.0	LOS B	1.3	32.2				
North: SB SR 29													
Lane 1 [d]	1038	2.0	1582	0.656	100	4.3	LOS A	9.0	229.4	Full	1600	0.0	0.0
Approach	1038	2.0		0.656		4.3	LOS A	9.0	229.4				
West: EB Rutherford Rd													
Lane 1 [d]	5	2.0	523	0.009	100	15.2	LOS B	0.1	1.6	Full	1600	0.0	0.0
Approach	5	2.0		0.009		15.2	LOS B	0.1	1.6				
Intersection	2314	2.0		0.749		4.8	LOS A	11.1	281.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1154	37	1192	2.0	1591	0.749	100	NA	NA
Approach	1	1154	37	1192	2.0		0.749			

East: WB Rutherford Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	34	1	44	79	2.0	453	0.175	100	NA	NA
Approach	34	1	44	79	2.0		0.175			

North: SB SR 29

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	37	1000	1	1038	2.0		1582	0.656	100	NA	NA
Approach	37	1000	1	1038	2.0			0.656			
West: EB Rutherford Rd											
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	2	1	1	5	2.0		523	0.009	100	NA	NA
Approach	2	1	1	5	2.0			0.009			

	Total	%HV	Deg.Satn (v/c)
Intersection	2314	2.0	0.749

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: EB Rutherford Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

Appendix E – Signal Warrant Worksheets

Warrant 1 Results

Existing Weekday Volumes

Hour	Condition A - 100%					Condition B - 100%				
	Major Street Volume (both approaches)		Higher-Volume Minor Street Approach (one direction only)		Met?	Major Street Volume (both approaches)		Higher-Volume Minor Street Approach (one direction only)		Met?
	Measured (vph)	**Required** (vph)	**Measured** (vph)	**Required** (vph)		**Measured** (vph)	**Required** (vph)	**Measured** (vph)	**Required** (vph)	
1	1506	500	68	150	No	1506	750	68	75	No
2	1572	500	66	150	No	1572	750	66	75	No
3	1502	500	70	150	No	1502	750	70	75	No
4	1601	500	75	150	No	1601	750	75	75	Yes
5	1680	500	79	150	No	1680	750	79	75	Yes
6	1609	500	75	150	No	1609	750	75	75	Yes
7	1601	500	89	150	No	1601	750	89	75	Yes
8	1692	500	96	150	No	1692	750	96	75	Yes
9	1562	500	98	150	No	1562	750	98	75	Yes
10	1432	500	99	150	No	1432	750	99	75	Yes
11	997	500	51	150	No	997	750	51	75	No
12	799	500	41	150	No	799	750	41	75	No
				Met for at least 8 hours?	**No**				Met for at least 8 hours?	**No**
									Warrant Met?	**No**

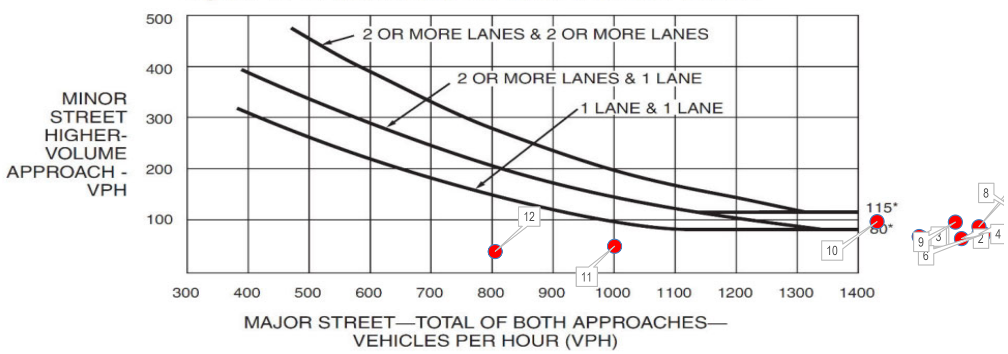
Hour	Condition A - 70%					Condition B - 70%				
	Major Street Volume (both approaches)		Higher-Volume Minor Street Approach (one direction only)		Met?	Major Street Volume (both approaches)		Higher-Volume Minor Street Approach (one direction only)		Met?
	Measured (vph)	**Required** (vph)	**Measured** (vph)	**Required** (vph)		**Measured** (vph)	**Required** (vph)	**Measured** (vph)	**Required** (vph)	
1	1506	350	68	105	No	1506	525	68	52.5	Yes
2	1572	350	66	105	No	1572	525	66	52.5	Yes
3	1502	350	70	105	No	1502	525	70	52.5	Yes
4	1601	350	75	105	No	1601	525	75	52.5	Yes
5	1680	350	79	105	No	1680	525	79	52.5	Yes
6	1609	350	75	105	No	1609	525	75	52.5	Yes
7	1601	350	89	105	No	1601	525	89	52.5	Yes
8	1692	350	96	105	No	1692	525	96	52.5	Yes
9	1562	350	98	105	No	1562	525	98	52.5	Yes
10	1432	350	99	105	No	1432	525	99	52.5	Yes
11	997	350	51	105	No	997	525	51	52.5	No
12	799	350	41	105	No	799	525	41	52.5	No
				Met for at least 8 hours?	**No**				Met for at least 8 hours?	**Yes**
									Warrant Met?	**Yes**

Hour	Condition A - 56%					Condition B - 56%				
	Major Street Volume (both approaches)		Higher-Volume Minor Street Approach (one direction only)		Met?	Major Street Volume (both approaches)		Higher-Volume Minor Street Approach (one direction only)		Met?
	Measured (vph)	**Required** (vph)	**Measured** (vph)	**Required** (vph)		**Measured** (vph)	**Required** (vph)	**Measured** (vph)	**Required** (vph)	
1	1506	280	68	84	No	1506	420	68	42	Yes
2	1572	280	66	58.8	Yes	1572	420	66	42	Yes
3	1502	280	70	58.8	Yes	1502	420	70	42	Yes
4	1601	280	75	58.8	Yes	1601	420	75	42	Yes
5	1680	280	79	58.8	Yes	1680	420	79	42	Yes
6	1609	280	75	58.8	Yes	1609	420	75	42	Yes
7	1601	280	89	58.8	Yes	1601	420	89	42	Yes
8	1692	280	96	58.8	Yes	1692	420	96	42	Yes
9	1562	280	98	58.8	Yes	1562	420	98	42	Yes
10	1432	280	99	58.8	Yes	1432	420	99	42	Yes
11	997	280	51	58.8	No	997	420	51	42	Yes
12	799	280	41	58.8	No	799	420	41	42	No
				Met for at least 8 hours?	**Yes**				Met for at least 8 hours?	**Yes**
									Warrant Met?	**Yes**

Hour	Measured Volume (vph)		Above Threshold Volume?	
	Major Street (Total of Both Approaches) X Axis	Minor Street Higher-Volume Approach Y Axis	100%	70%
1	1506	68	No	**Yes**
2	1572	66	No	**Yes**
3	1502	70	No	**Yes**
4	1601	75	No	**Yes**
5	1680	79	No	**Yes**
6	1609	75	No	**Yes**
7	1601	89	**Yes**	**Yes**
8	1692	96	**Yes**	**Yes**
9	1562	98	**Yes**	**Yes**
10	1432	99	**Yes**	**Yes**
11	997	51	No	No
12	799	41	No	No
		Warrant Met?	**Yes**	**Yes**

Major Street 1 lane
Minor Street 1 lane

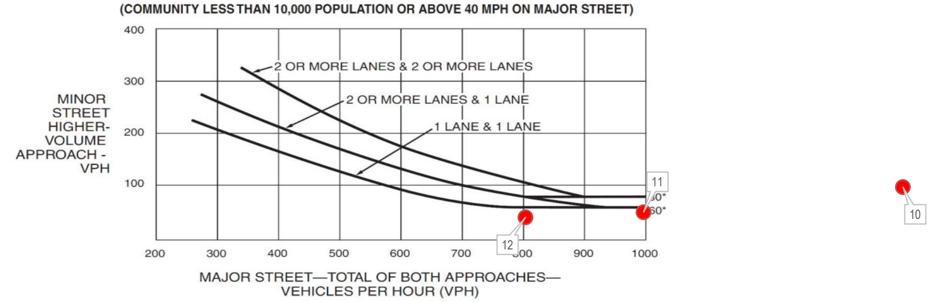
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

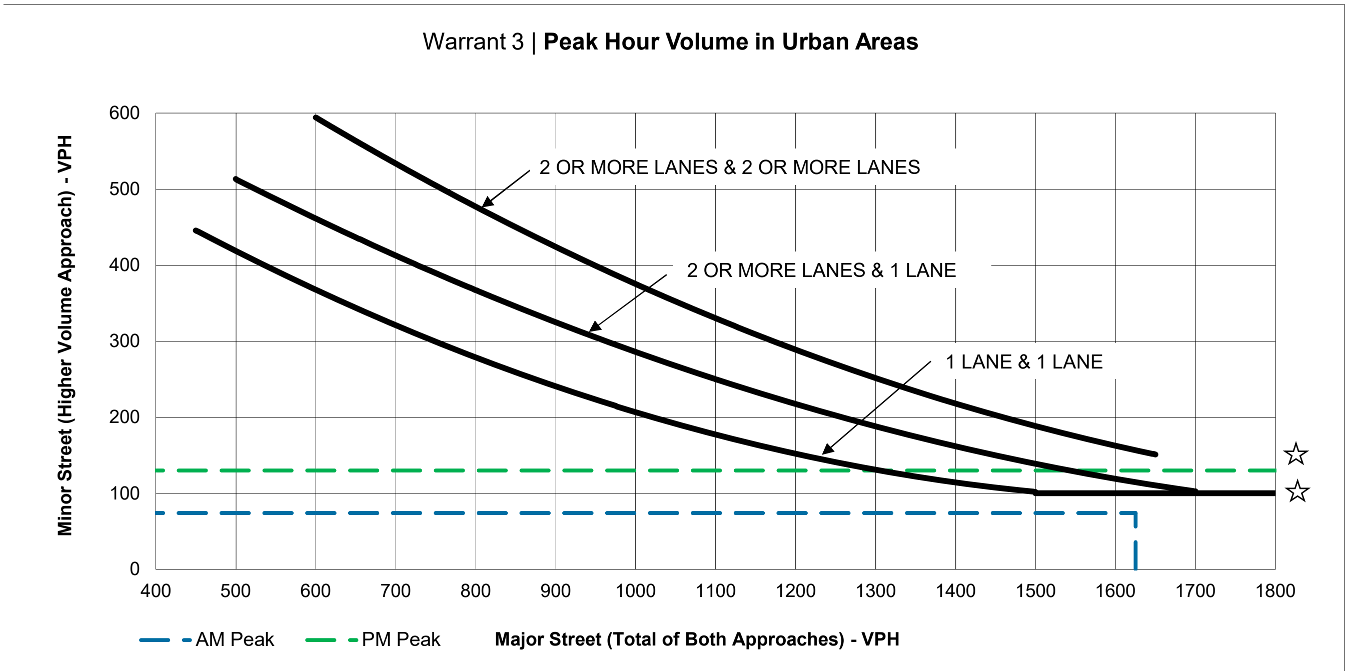
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ **NOTE:**

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

		Number of Lanes
Major Approach	SR 29	1
Minor Approach	Rutherford Road	1
	AM Peak	PM Peak
Major St. Volume (both approaches):	1,625	1,862
Minor St. Volume (higher volume approach):	74	130
Warrant Met?:	**No**	**Yes**

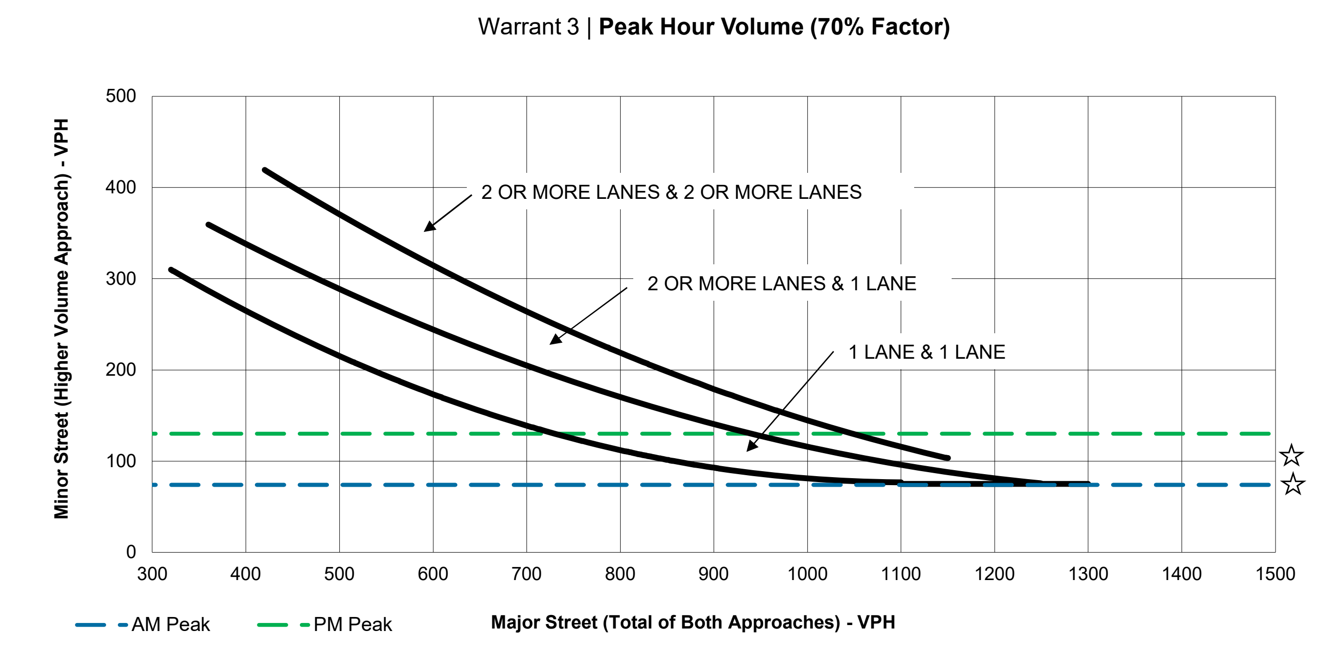
Volumes for higher minor street

Typical Peak Hour

AM Peak
0
0

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆

NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR 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.

Existing (AM/PM)

		Number of Lanes		
Major Approach	SR 29	1		
Minor Approach	Rutherford Road	1		
	AM Peak	PM Peak	**Volumes for higher minor street**	AM Peak
Major St. Volume (both approaches):	1,625	1,862		0
Minor St. Volume (higher volume approach):	74	130		0
Warrant Met?:	**No**	**Yes**		

Appendix F – 2025 and 2035 Traffic Forecasts Memorandum

Memorandum

December 19, 2022

To	Ingrid Supit, MTC; Pamela Kwan, MTC		
Copy to	James Zandian, GHD; Stephanie Ledbetter, GHD		
From	Kamesh Vedula, GHD; Paige Thornton, GHD; Zach Stinger, GHD	**Project No.**	11227647
Project Name	*Napa Valley Forward SR 29 Safety & Operational Intersection Improvements at PM 22.520 and PM 24.595*		
Subject	2025 and 2035 Forecasts		

1. Introduction

GHD was retained by the Metropolitan Transportation Commission (MTC) to assist in the planning and design of potential improvements at the project's two study intersections along State Route (SR) 29 at Rutherford Road *(PM 24.595)* and Oakville Cross Road (PM 22.520), in the Napa County communities of Rutherford and Oakville (hereinafter referred to as the "study intersections"). SR 29 is a key route providing north/south connectivity to residential and commercial land use destinations within the Napa Valley and beyond to adjacent Solano and Lake Counties. The section of the SR 29 corridor in which the study intersections are located regularly experiences heavy traffic congestion during peak periods, resulting in safety, delay, and queueing issues at minor approaches of Rutherford Road and Oakville Cross Road. Figure 1-1 presents the study area vicinity map.

This memorandum was prepared by GHD to summarize the methodologies utilized for validating a small sub-area in the Napa Valley of the Napa-Solano Travel Demand Model and deriving traffic forecasts for the study intersections within Napa County. The purpose of obtaining these traffic forecasts is to assist in the design of potential improvements of the study intersections. The PDT established that forecasts would need to be derived for the Year 2025 (opening year) and be adequate through 2035 (sensitivity/design year).

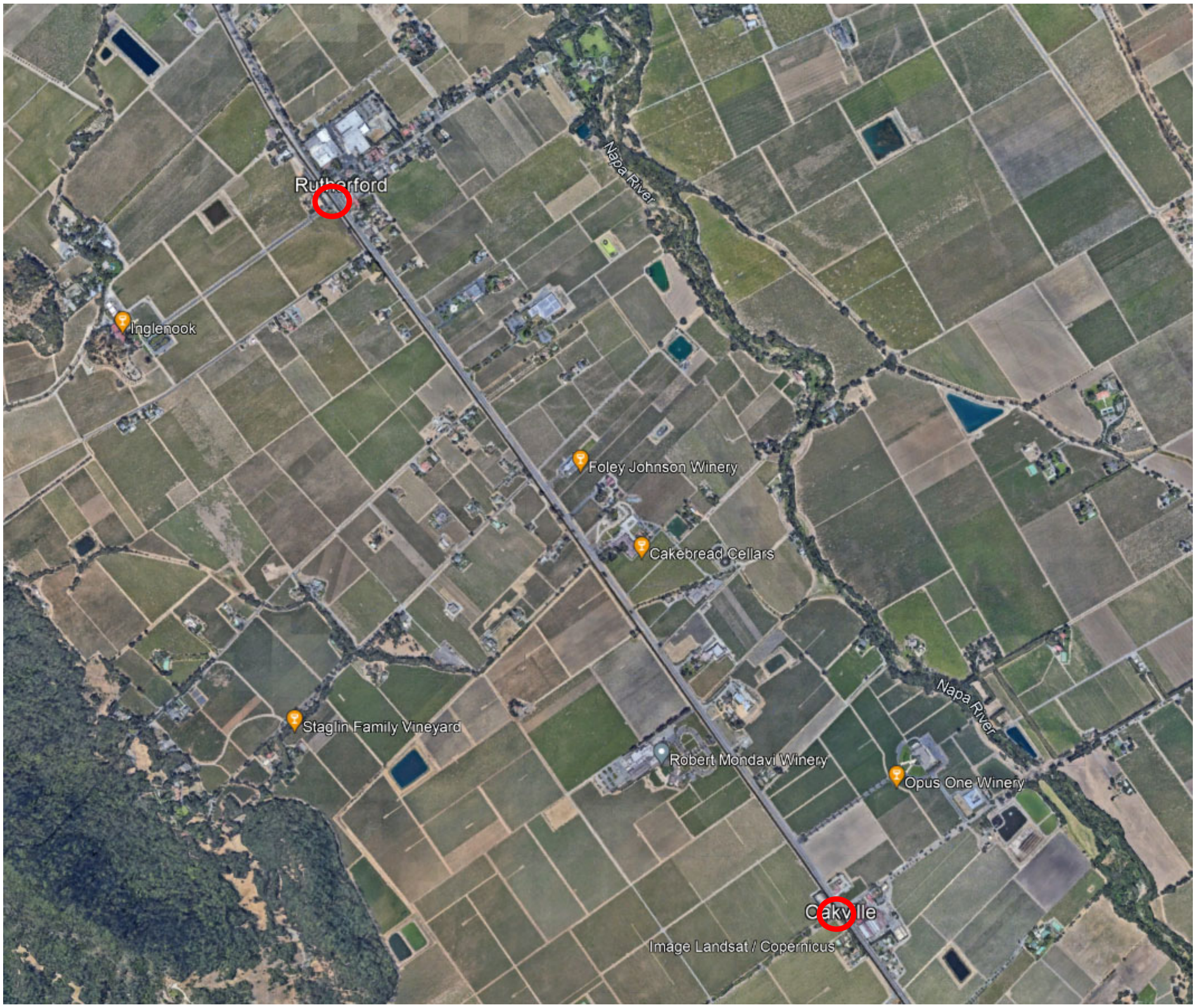
Purpose and Need

This project is needed to address operational and safety issues associated with high traffic volume and aggressive merging along SR 29 in the study area, specifically at the study intersections. The purpose of this project is to identify intersection improvements most appropriate to address the following project objectives at the study intersections:

- Provide a plan of near-term operational improvements that will improve intersection operations at the study intersections
- Develop intersection improvements to reduce excessive delays and queueing at minor approaches
- Improve safety for all modes, including vehicles, bicycles, and pedestrians

This Technical Memorandum is provided as an interim output under our agreement with MTC SF Bay Area. It is provided to foster discussion in relation to technical matters associated with the project and should not be relied upon in any way.

Figure 1-1: Study Area Vicinity Map



Study Intersections

This Technical Memorandum is provided as an interim output under our agreement with MTC SF Bay Area. It is provided to foster discussion in relation to technical matters associated with the project and should not be relied upon in any way.

2. Travel Demand Model

The Napa-Solano Travel Demand Model provides forecasts for the study area. Napa Valley Transportation Authority (NVTA) together with the Solano Transportation Authority (STA) maintain and utilize the Solano-Napa Activity Based Model (SNABM). The quote from Napa County Model Validation Report is provided here: "*SNABM is based on the regional travel demand model, Travel Model One, developed and maintained by the Metropolitan Transportation Commission (MTC). The SNABM is required to be consistent with Travel Model One and hence uses the same land use and model scripts as Travel Model one. The main difference between the models lies in the more refined travel analysis zone (TAZ) and roadway/transit network structure in the SNABM. Travel Model One includes 1,454 TAZs while the SNABM includes 2,334, including 987 TAZs in Napa and Solano counties*". Model plots are included in Appendix A.

2.1 Objective

The purpose of this memorandum is to obtain the approval of the traffic forecasts for the study intersections from Caltrans District 4 Division of Traffic Forecasting for the Opening Year (2025) and Sensitivity/ Design Year (2035). These forecasts will be utilized to evaluate traffic operations for all feasible and viable alternatives which will improve operations at the study intersection. This memorandum presents methodology and results for the following:

- Validation of the SNABM Year 2015 Model network using a link level analysis.
- Traffic Volume Forecasting for Opening Year (2025) and Sensitivity/ Design Year (2035).

2.2 Project Study Area

SR 29

SR 29 is a two-lane, north-south conventional highway with discontinuous two-way-left-turn lanes (TWLTL) between the study intersections. The highway serves residential, commercial, and agricultural land uses within the County of Napa. North of Rutherford Road, SR 29 and SR 129 are contiguous. Further south of the study intersection locations, SR 29, and SR 121, as well as SR 29 and SR 12 are contiguous. The posted speed limit along SR 29 within the study area ranges from 40 to 50 miles per hour (mph) between Rutherford Road and just north of Madison Street. Just south of Madison Street, SR 29 becomes a four-lane divided highway, and the speed limit increases to 55 mph.

Rutherford Road/SR 128

Rutherford Road, contiguous with SR 128, is a two-lane, east-west highway located in the community of Rutherford that serves residential and commercial land uses. It connects to SR 29 to the west, forming the east leg of the study intersection, and becomes Conn Creek Road/SR 128 to the east. The posted speed limit on Rutherford Road near the study intersection is 30 mph.

Oakville Cross Road

Oakville Cross Road is a two-lane, east-west collector roadway located in the community of Oakville that serves commercial and agricultural uses. It connects to SR 29 forming the east leg of the study intersection and connects to Silverado Trail to the east. There is no posted speed limit on Oakville Cross Road other than a 25-mph zone near the bridge over the Napa River, about 0.5 miles to the east of SR 29. There are 30 mph advisory signs along the eastern segment of the roadway.

3. Existing Data Summary

3.1 Traffic Data

Intersection turning movement counts were collected for the study intersections and daily traffic counts were collected for roadway segments on SR 29 between Rutherford Road and Oakville Cross Road. These counts were collected between May 5th, 2022, and May 8th, 2022. Counts at the study intersections were collected for the weekday AM peak period (between 6:00 AM to 9:00 AM), the weekday PM peak period (between 3:00 PM to 7:00 PM), and for the weekend mid-day peak period (between 11:00 AM to 3:00 PM). The total weekday daily traffic for the SR 29 segment between Oakville Cross Road and Rutherford Road was found to be 20,500, of which the NB traffic was 10,900 and the SB traffic was 9,620. Appendix B contains this data.

3.2 Caltrans provided Traffic Data

Caltrans publishes ADT data in a count book annually for all the facilities on the State Highway System. As noted in the count book, few locations are counted continuously, and the resulting counts are adjusted to derive an estimate of ADT.

More recent pre-pandemic data for 2019 was reviewed from the Caltrans count book in the project vicinity. The 2019 ADT data in the project vicinity (around PM 22.52 and 24.595) was found to be around 24,600 to 26,400.

Caltrans Highway Operations unit collected ADT counts in 2017 on the SR 29 segment north of the Oakville Cross Road in the northbound direction only. The actual data in 2017 was collected over a one-week period beginning April 12, 2017, thru April 19, 2017. The weekday average daily traffic over this period was found to be 10,900 NB only (Appendix B contains this data). A comparison of 2017 Caltrans count in the NB direction and the 2022 May count indicates that the volume was almost identical and no growth in traffic was observed. Based on the data obtained in 2022, the combined NB and SB ADT can be estimated to 20,500.

For 2017, the ADT data from the count book in the project vicinity (around PM 22.52 and 24.595) was found to be around 26,000 to 28,000, which is higher than the 20,500 ADT based on the actual count data. As the data from count book are estimates, for the purposes of this forecast memorandum, the 2017 data obtained by Caltrans Highway Operations through actual in-field counts was utilized for model validation.

4. SNABM Regional Model

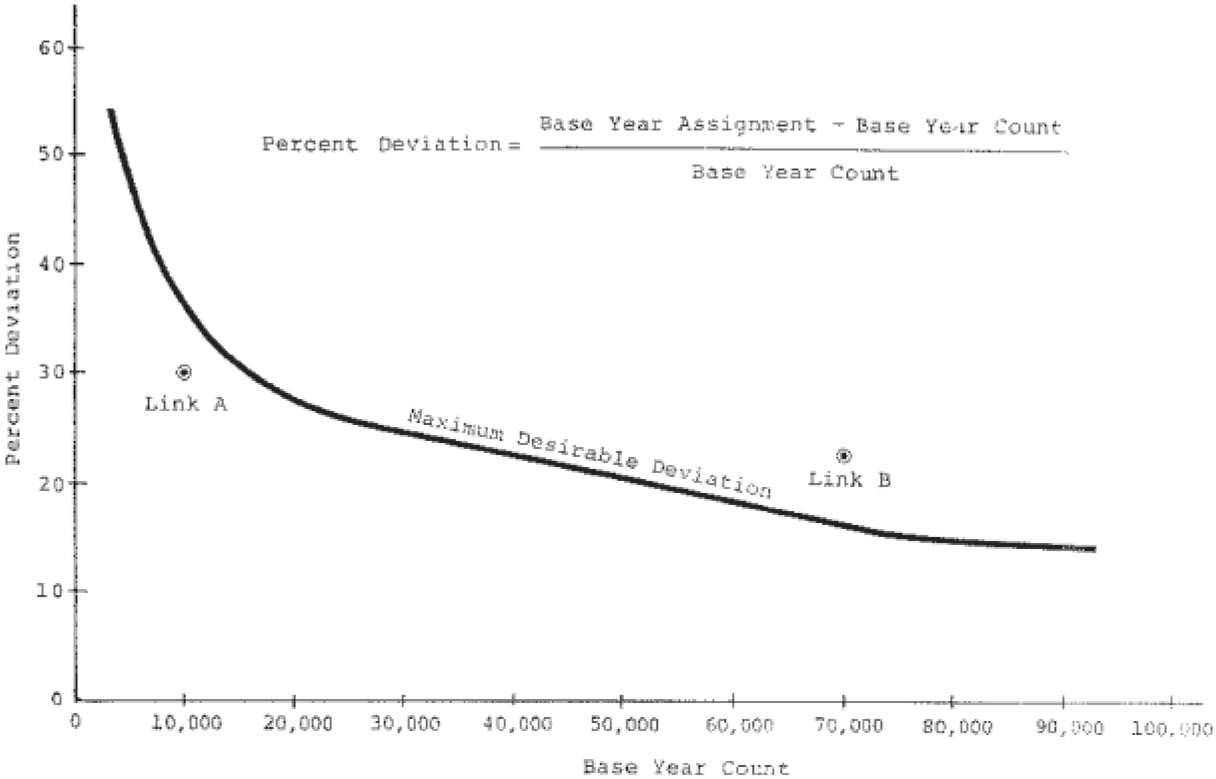
The SNABM Regional Travel Demand Model provides a network that includes the entire Bay Area region (comprised of nine counties) including Napa County and provides 2015 and 2040 traffic volumes at the study intersections. This regional model is based on land use and socio-economic data and uses the trip generation characteristics of various land uses to predict the travel interaction. The model outputs Year 2015 (as Model Baseline Year) and Year 2040 (as Model Horizon Year) volumes in the form of directional daily volumes.

4.1.1 Model Validation Methodology, Guidelines and Considerations

The validation of the SNABM Regional TDM was conducted using the link level static model validation techniques recommended within the *Analytical Travel Forecasting Approaches for Project-Level Planning and Design* produced by the National Cooperative Highway Research Program Report 765 (NCHRP 765) in 2014.

The following sections present the methodology and validation standards for the techniques listed above:

Figure 2 – Maximum Desirable Deviation as obtained from Figure 4-13 of the NCHRP 765



Some of the considerations for model validation as agreed with PDT are provided below:

- Roundabout is being considered for the intersection of SR 29/Oakville Cross
- Roundabout is not being considered for the intersection of SR 29/Rutherford
- Rutherford and Oakville Cross are very minor streets carrying a total daily volume of 4,000 or less
- As such, we checked model validation on the SR 29 segment in the study area

4.1.2 Link Level Validation

Since the model data was 2015 and daily count data for SR 29 in the NB direction north of Oakville Cross Road was 2017 (10,900 – from actual Caltrans counts), the model data was scaled up using interpolation between 2015 (8,794 – model volume) and 2040 (10,969 – model volume) to derive year 2017 model estimate. The 2017 model estimate for the SR 29 segment north of Oakville Cross Road was calculated to be approximately 9,000.

The percent difference in the actual count (10,900) to the model estimate (9,000) was found to be approximately 21%. Given the regional nature of the model and the guidelines provided within the NCHRP 765 as shown in Figure 2 above, it is concluded that the SNABM Model forecasts reasonably replicate existing conditions within the model limitations. Based on the validation analysis, it can be concluded that the SNABM Model can be used to forecast future volumes at this study intersection.

The 2022 data and 2017 traffic count data were found to be almost identical. Therefore, for the purposes of this memorandum, the 2022 TMC data was treated as the 2017 data. Figure 4-1 and 4-3 show existing Turning Movement Counts (TMC) at the Oakville Cross Road intersection the Rutherford intersection. Figure 4-12 and 4-4 show existing Turning Movement Counts (TMC) expressed as percentage of the approach volume at the Oakville Cross Road intersection the Rutherford intersection.

Figure 4-1: 2017 Peak Hour Turning Movement Counts @ Oakville Cross Road

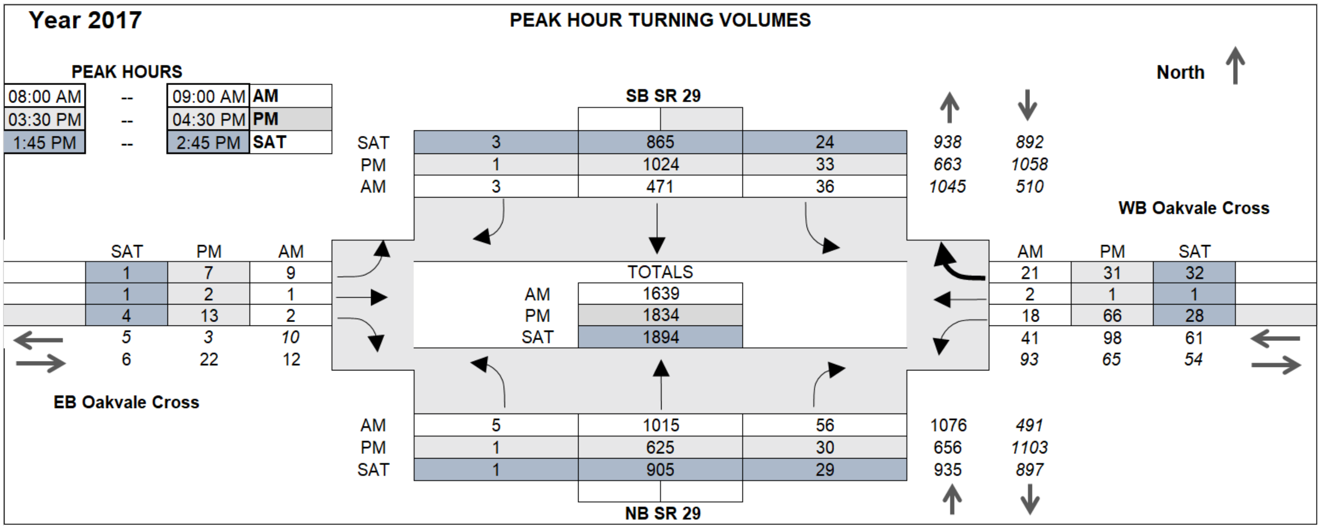


Figure 4-2: 2017 Peak Hour Turning Movement Percentages @ Oakville Cross

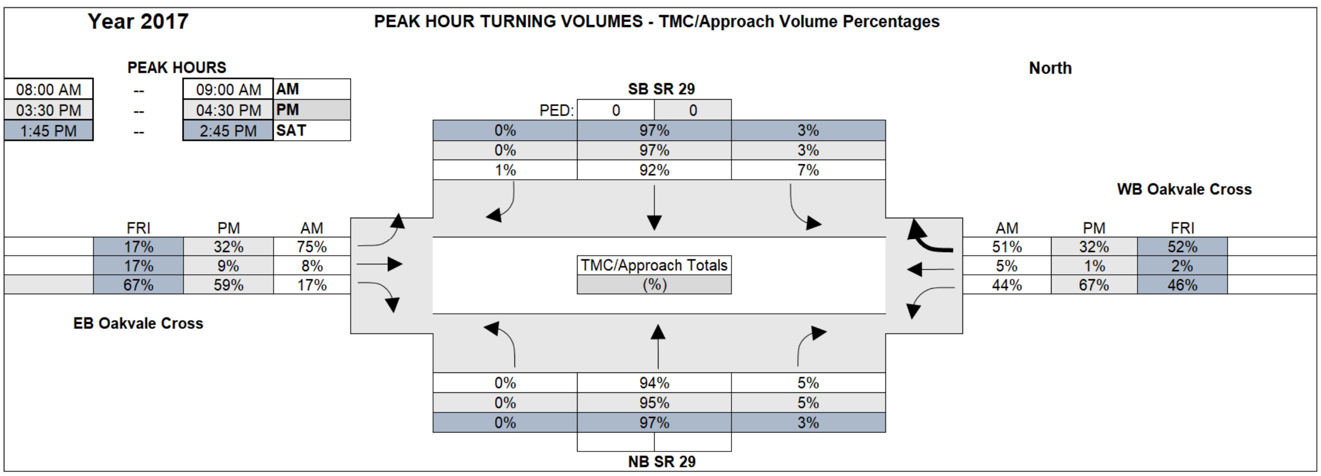


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Figure 4-3: 2017 Peak Hour Turning Movement Counts @ Rutherford

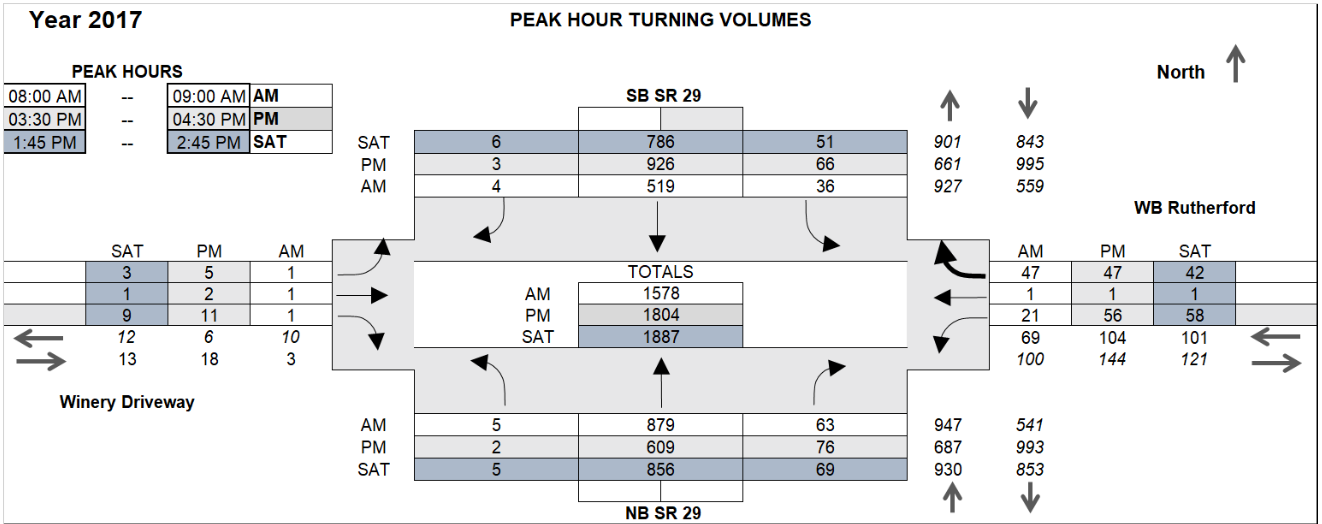
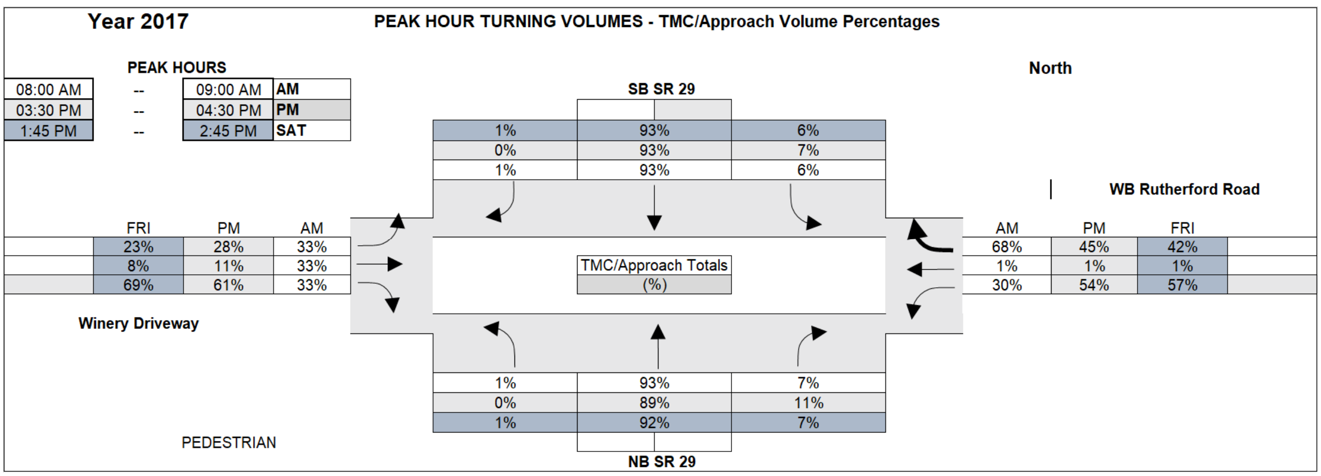


Figure 4-4: 2017 Peak Hour Turning Movement Percentages @ Rutherford



5. Forecasting Methodology for Year 2035 Conditions

The SNABM Model can provide traffic volume projections up to (and including) Year 2040 (which is the Model Horizon Year). The following sections present the core methodology used in forecasting turning movement volumes for the AM, PM, and Weekend peak hours of Year 2025 and 2035 Conditions.

5.1 Volume Forecasting

Two methods are typically used for forecasting: 1. Delta Method and Growth Rate Method. Based on a sensitivity testing with the two methods, the Growth Rate method provided conservative forecasts at this study location. As such, the Growth Rate was used for forecasting in this memorandum.

5.2 Growth Rate

An annual growth rate was derived for the SR 29, Oakville Cross Road, and Rutherford Road segment in the study area. The annual growth rate was be derived through a comparison of the Year 2015 model volumes to the Year 2040 model volumes. The annual growth rate was then utilized to obtain an 8-year cumulative growth rate to derive 2025 forecasts and 18-year growth rate to derive 2035 forecasts. Figure 5-1 contains the growth rates derived from the model.

Figure 5-1: Growth Rates in the Study Area

Segment	2105 Model ADT	2040 Model ADT	Annual Growth Rate	25 Year Cumulative Growth Rate	8 Year Cumulative Growth Rate	18 Year Cumulative Growth Rate
SR 29 South of Oakvale	18382	23502	1.11%	27.85%	8.91%	20.05%
SR 29 North of Oakvale	16789	21496	1.12%	28.04%	8.97%	20.19%
SR 29 South of Rutherford	16035	21026	1.25%	31.13%	9.96%	22.41%
SR 29 North of Rutherford	15377	20084	1.22%	30.61%	9.80%	22.04%
Average Growth Rate	**16646**	**21527**	**1.17%**	**29.32%**	**9.38%**	**21.11%**
Oakvale Cross east of SR 29	1372	1943	1.66%	41.62%	13.32%	29.97%
Rutherford east of SR 29	774	1084	1.60%	40.05%	12.82%	28.84%

For SR 29, the average annual growth rate in the study was found to be 1.17%; the 8-year cumulative growth rate was found to be 9.38% and the 18-year cumulative growth rate was found to be 21.11%.

For Oakville Cross Road east of SR 29, the average annual growth rate in the study was found to be 1.66%; the 8-year cumulative growth rate was found to be 13.32% and the 18-year cumulative growth rate was found to be 29.97%. The road segment to the west of SR 29 carries insignificant traffic. As such, the same growth rate will be used for the road segment to the west of SR 29.

For Rutherford Road east of SR 29, the average annual growth rate in the study was found to be 1.60%; the 8-year cumulative growth rate was found to be 12.82% and the 18-year cumulative growth rate was found to be 28.84%. The road segment to the west of SR 29 carries insignificant traffic. As such, the same growth rate will be used for the road segment to the west of SR 29.

6. Year 2035 Turning Movement Volumes

Future Year 2035 intersection turning movements were derived by applying the growth factor to the existing TMC percentages and the resulting growth this derived were added to the existing TMC.

Figures 6.1 and 6.2 present the Year 2035 turning movement volumes and the Turning Movement Counts (TMC) expressed as percentage of the approach volume at the Oakville Cross Road intersection while Figures 6.3 and 6.4 present the Year 2035 turning movement volumes and the Turning Movement Counts (TMC) expressed as percentage of the approach volume at the Rutherford Road intersection.

Figure 6.1 – Year 2035 Turning Movement Volumes – Oakville Cross Road Intersection

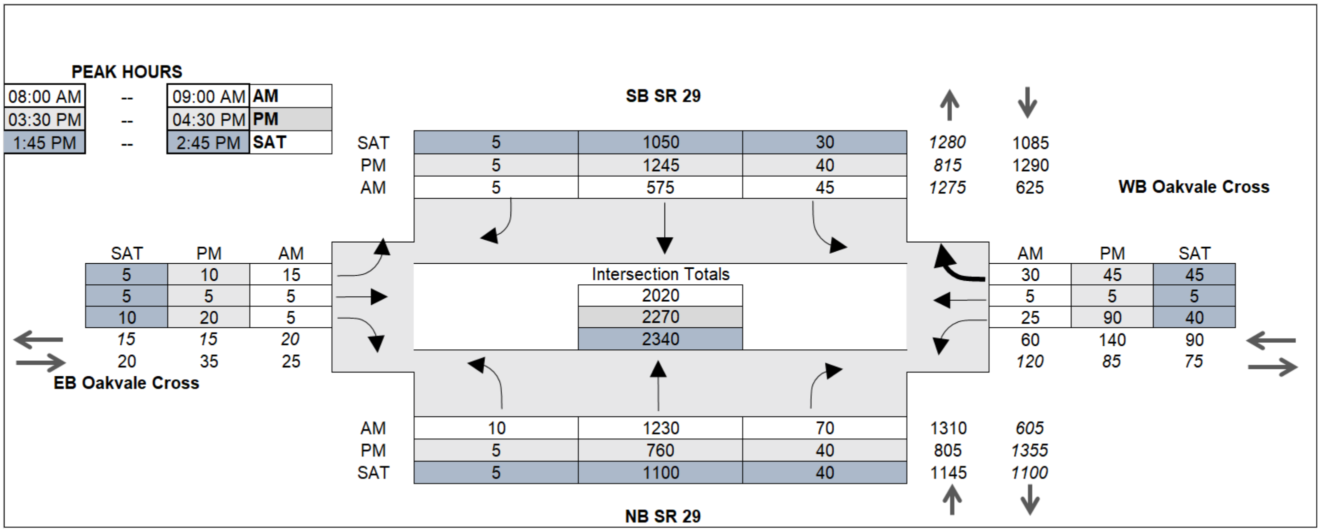


Figure 6.2 – Year 2035 Turning Movement Volumes in % of approach volumes– Oakville Cross Road Intersection

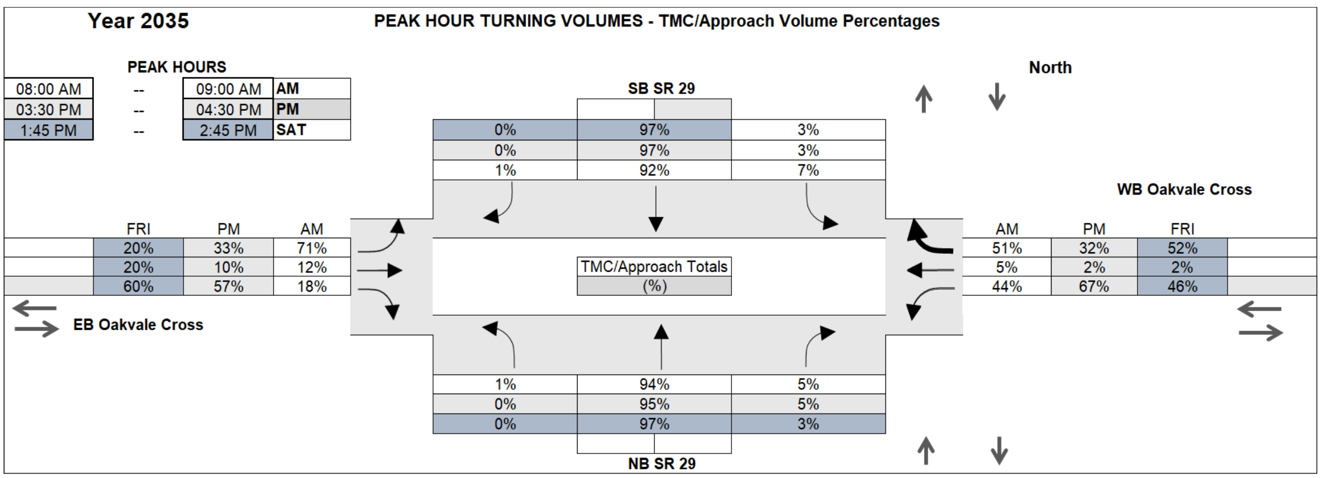


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Figure 6.3 – Year 2035 Turning Movement Volumes – Rutherford Cross Road Intersection

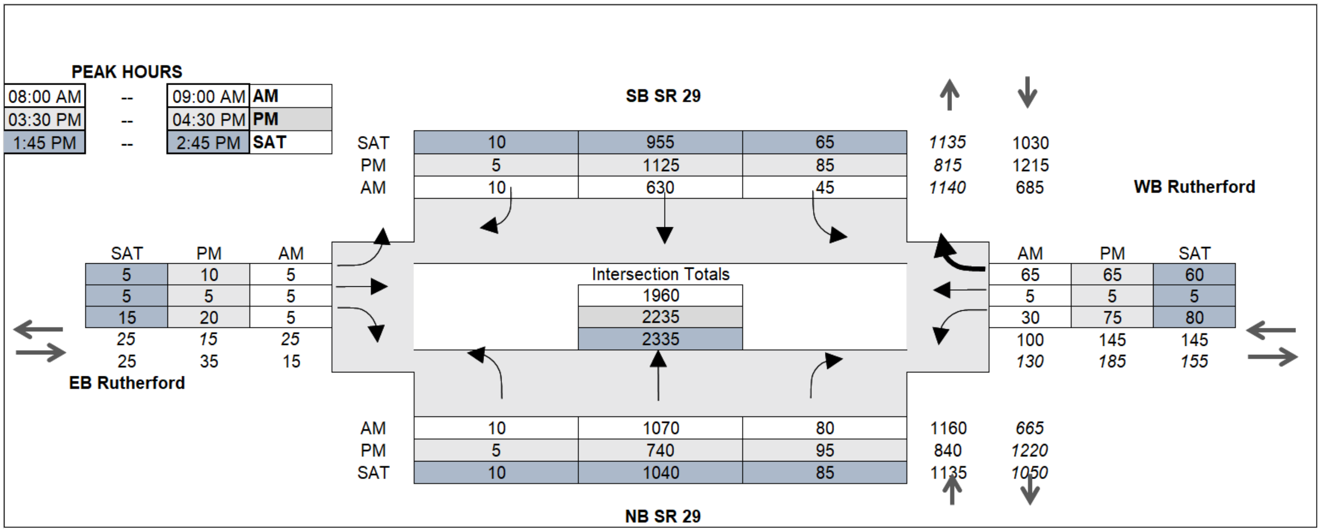
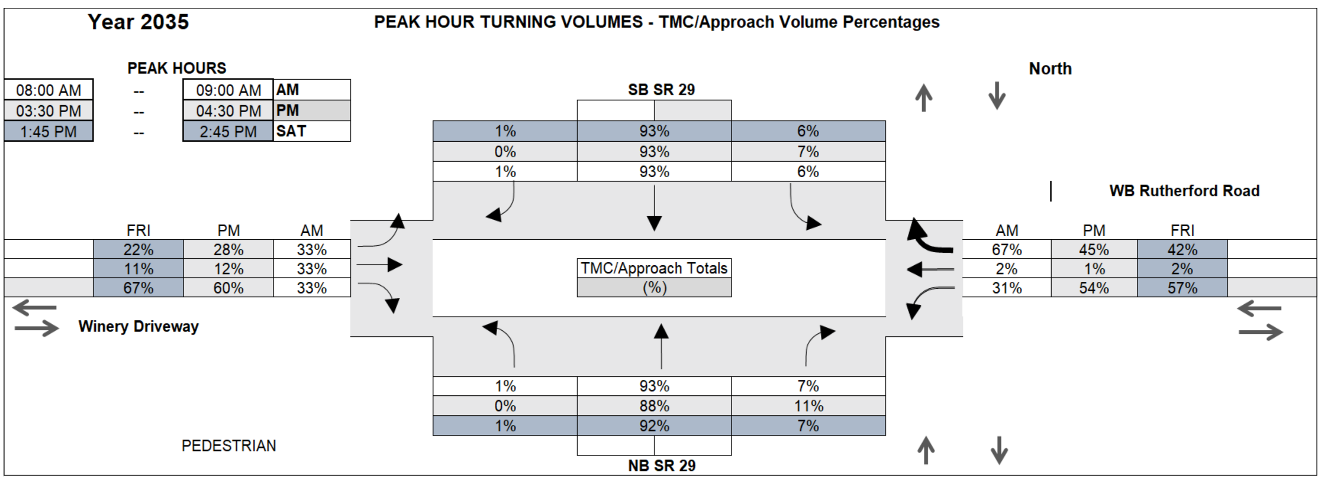


Figure 6.4 – Year 2035 Turning Movement Volumes in % of approach volumes– Rutherford Road Intersection



6.1 Year 2025 Volume Forecasts

Per input received from the Project Development Team (PDT), it was determined that an Opening Year was to be analyzed for any proposed intersection improvements. The Opening Year for intersection improvements was determined to be Year 2025.

Future Year 2035 intersection turning movements were derived by applying the growth factor to the existing TMC percentages and the resulting growth this derived were added to the existing TMC.

Figures 6.5 and 6.6 present the Year 2025 turning movement volumes and the Turning Movement Counts (TMC) expressed as percentage of the approach volume at the Oakville Cross Road intersection while Figures 6.7 and 6.8 present the Year 2025 turning movement volumes and the Turning Movement Counts (TMC) expressed as percentage of the approach volume at the Rutherford Road intersection.

Figure 6.5 – Year 2025 Turning Movement Volumes – Oakville Cross Road Intersection

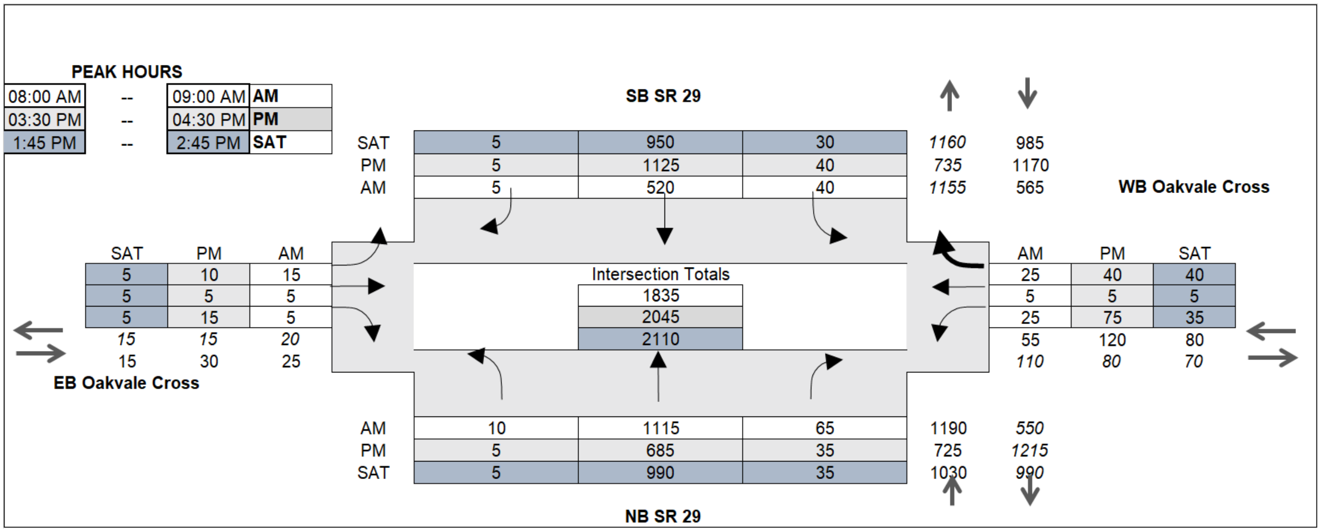
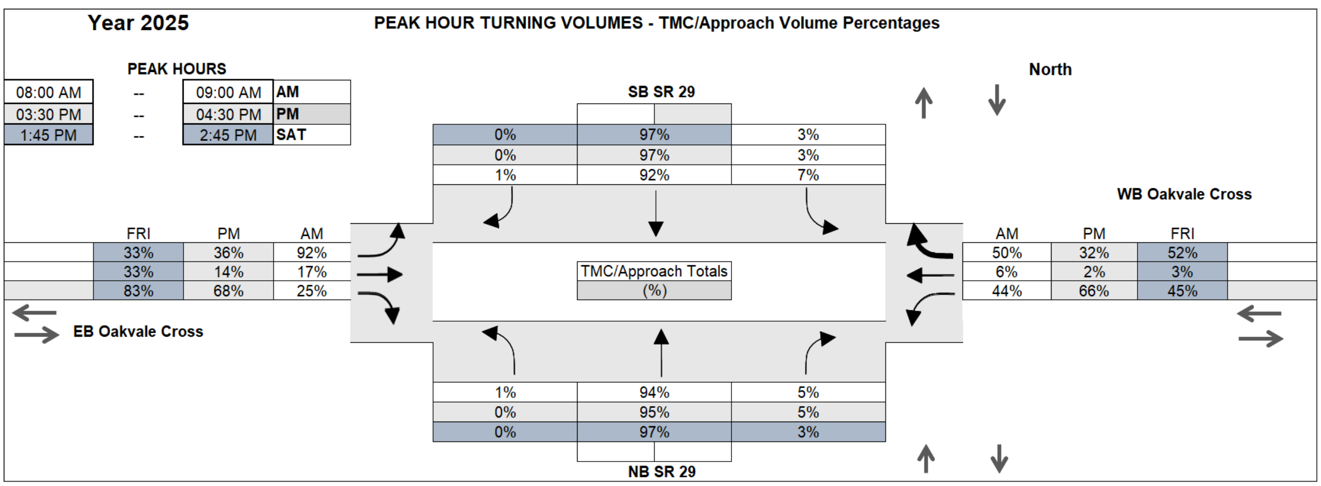


Figure 6.6 – Year 2025 Turning Movement Volumes in % of approach volumes– Oakville Cross Intersection



This Technical Memorandum is provided as an interim output under our agreement with MTC SF Bay Area. It is provided to foster discussion in relation to technical matters associated with the project and should not be relied upon in any way.

Figure 6.7 – Year 2025 Turning Movement Volumes – Rutherford Intersection

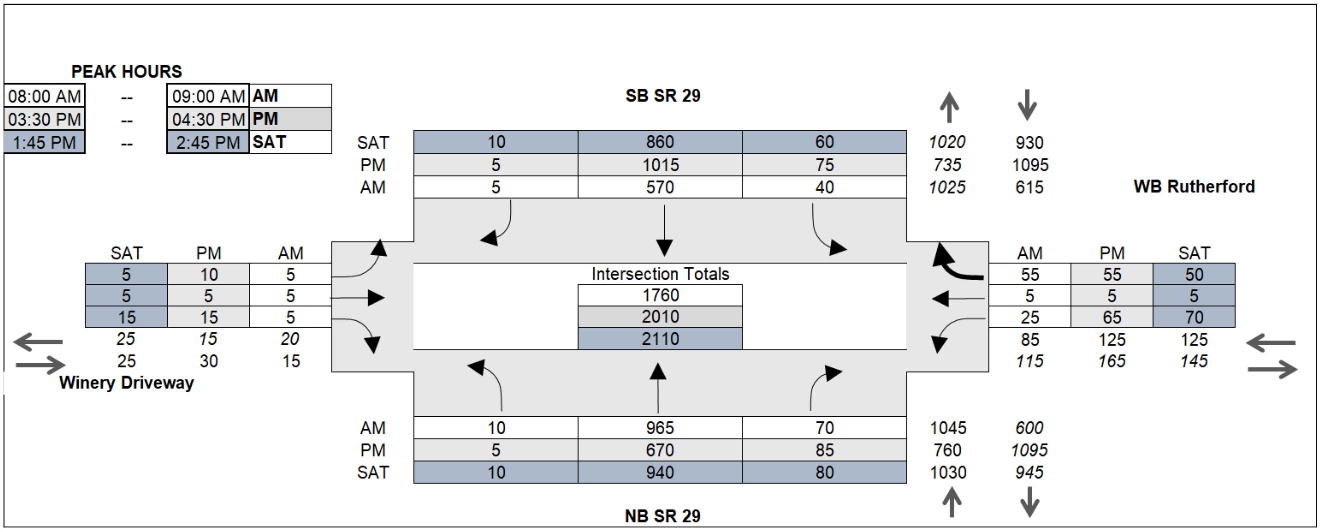
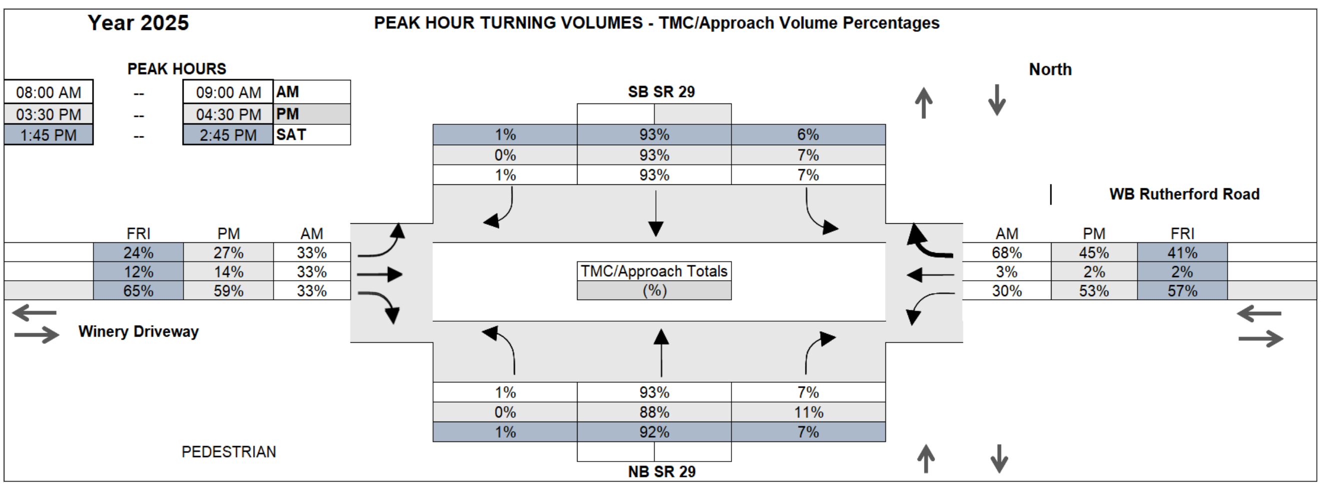


Figure 6.8 – Year 2025 Turning Movement Volumes in % of approach volumes– Rutherford Road Intersection



This Technical Memorandum is provided as an interim output under our agreement with MTC SF Bay Area. It is provided to foster discussion in relation to technical matters associated with the project and should not be relied upon in any way.

From:	Patel, Mahendra N@DOT
To:	Kamesh Vedula
Cc:	Cox, Phillip@DOT; Ingrid Supit; James Zandian; Henry Hammel; Cabangangan, Anthony@DOT
Subject:	Re: Discuss Forecasts->Approved by Forecasting Division
Date:	Tuesday, December 20, 2022 3:27:23 PM

All looks good and Forecast Division is approving the Forecast memo. Thanks for your prompt response.

Thanks,

Mahendra Patel, P.E.

Office of Project Initiation & Travel Forecasting

California Department of Transportation - District 4

111 Grand Ave

Oakland, CA 94612

e-mail: mahendra.patel@dot.ca.gov

Mobile: 510-407-7458

On Dec 19, 2022, at 11:47 AM, Kamesh Vedula <Kamesh.Vedula@ghd.com> wrote:

Hello Mahendra.

Thank you for taking the time last week to discuss the comments and responses/approach. Below are the comments and draft responses. To Attached also is the revised Traffic Forecast. Revisions are highlighted in yellow for ease of review.

Comment: Pl put post miles at both the intersections in the subject line as well as in the body as a useful reference

Response: Comment noted. Will update the forecast memorandum to include PM at the intersections.

2019 ADT data on CA 29 at Rutherford/CA 128 is 24,600 and at the Oakville Grade Road is 26,400. The ADT used in the report is 20,500 which is about 20% below the 2019 counts, please verify and bring the counts up accordingly. 2018 counts are even higher than the 2019 counts The traffic counts need to represent pre-pandemic levels, because traffic will eventually normalize to those levels as employees return to work and businesses are slowly revamping. Below is a copy-paste of Yr 2019 data, FYI. CT does not rely on just one set of counts, CT looks at what is available and decides what to use based on the engineering judgement - suitable to the facility type and area type.

Response: Comment noted. Section 3.2 was updated to address the comment and the follow on discussion with Caltrans Forecasting Unit.

Use the model growth factor (bet 2015 & 2040)and apply that growth factor to the link level traffic count data to obtain future years link volumes which can then be used to derive TMCs for future years.

Response: Comment noted. As noted in comment 2 above, anomalies exist between the 2017 count data and the actual counts. To provide for a reasonably conservative forecasts to account for anomalies, the forecasts were derived using the growth rate and the delta method. The growth rate provided slightly conservative forecasts. As such, it was agreed that the growth rate method will be utilized to derive the forecasts. An annual growth rate will be derived for the SR 29, Oakville Cross Road and Rutherford Road segment in the study area. The annual growth rate will be derived through a comparison of the Year 2015 model volumes to the Year 2040 model volumes. This annual growth rate will be applied linearly to derive 2025 and 2035 growth rates, which will then be applied to the existing traffic volumes to obtain forecast volumes.

Similar to figure 6.1 provide another figure that shows the percentages for each turning movement at all four legs to get an idea.
Response: Comment noted. Will update the forecast memorandum to include an exhibit that shows the percentages for each turning movement at the study intersections. intersections.

Isn't the Napa Wine Co project a part of the larger ABAG landuse forecasts for the future year since the SNBAM model is consistent with MTC's. If not, then won't this extra landuse throw the consistency off? Need an explanation.
Response: Comment noted. We added this landuse project to be conservative. However, we do agree with the comment and assessment of the landuses. On further discussion with Caltrans forecasting unit, it was agreed to remove the discussion associated with the Napa Wine Co project.

From: Patel, Mahendra N@DOT <Mahendra.Patel@dot.ca.gov>
Sent: Wednesday, December 14, 2022 10:00 AM
To: Kamesh Vedula <Kamesh.Vedula@ghd.com>
Cc: Cox, Phillip@DOT <phillip.cox@dot.ca.gov>
Subject: RE: Discuss Forecasts->I am available now if you are

OK let me get on line within a minute.

Thanks,
Mahendra Patel, P.E., Range D

Office of Project Initiation & Travel Forecasting
California Department of Transportation - District 4
111 Grand Ave
Oakland, CA 94612
e-mail: mahendra.patel@dot.ca.gov
Mobile: 510-407-7458

From: Kamesh Vedula <Kamesh.Vedula@ghd.com>
Sent: Wednesday, December 14, 2022 9:59 AM
To: Patel, Mahendra N@DOT <Mahendra.Patel@dot.ca.gov>
Subject: RE: Discuss Forecasts->I am available now if you are

EXTERNAL EMAIL. Links/attachments may not be safe.

Great. I'm available. Will be there in a moment.

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "Patel, Mahendra N@DOT" <Mahendra.Patel@dot.ca.gov>
Date: 12/14/22 9:56 AM (GMT-08:00)
To: Kamesh Vedula <Kamesh.Vedula@ghd.com>
Cc: "Cox, Phillip@DOT" <phillip.cox@dot.ca.gov>
Subject: RE: Discuss Forecasts->I am available now if you are

Hi Kamesh,
Good morning! I am available now, if you are available, we can talk on MS Teams.
Let me know.

Thanks,
Mahendra Patel, P.E., Range D

Office of Project Initiation & Travel Forecasting
California Department of Transportation - District 4
111 Grand Ave
Oakland, CA 94612
e-mail: mahendra.patel@dot.ca.gov
Mobile: 510-407-7458

From: Kamesh Vedula <Kamesh.Vedula@ghd.com>
Sent: Wednesday, December 14, 2022 9:14 AM
To: Patel, Mahendra N@DOT <Mahendra.Patel@dot.ca.gov>
Cc: Cox, Phillip@DOT <phillip.cox@dot.ca.gov>
Subject: Re: Discuss Forecasts

EXTERNAL EMAIL. Links/attachments may not be safe.

Got it Mahendra. Looking forward to talking to you this AM.

Sent from my Verizon, Samsung Galaxy smartphone
Get Outlook for Android

From: Patel, Mahendra N@DOT <Mahendra.Patel@dot.ca.gov>
Sent: Wednesday, December 14, 2022 8:42:33 AM
To: Kamesh Vedula <Kamesh.Vedula@ghd.com>
Cc: Cox, Phillip@DOT <phillip.cox@dot.ca.gov>
Subject: New Time Proposed: Discuss Forecasts

When: Wednesday, December 14, 2022 11:00 AM-11:45 PM.
Where:

> You don't often get email from mahendra.patel@dot.ca.gov. Learn why this is important

You had it up to 11:45 pm and I changed it to AM. Also, we don't need more than half hour.

Thanks.

Mahendra

PS: Phil, I have included you and if you are available please attend

<11227647_Forecasts Memo - December 19.pdf>

Appendix G – TASAS Data

EA 04-2W430

Traffic Accident Surveillance and Analysis System (TASAS)

Crash Data Analysis

The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409 and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

<u>TASAS Crash Data Analysis</u>

The Table B report identified in Table 1 was generated on December 12, 2021 and it depicts crash rates per million vehicle miles for the most recent 3 year period from 01/01/2018 to 12/31/2020 from the Traffic Accident Surveillance and Analysis System (TASAS).

TABLE 1

TASAS Table B Crash January 01, 2018 – December3, 2020)

Segment	TOTAL No. of Crashes	ACTUAL Rates (per million vehicle miles)			AVERAGE Rates (per million vehicle miles)		
		Fatal Crashes	Fatal + Injury Crashes	Total [(1)]	Fatal Crashes	Fatal + Injury Crashes	Total [(1)]
NAP 29 PM 22.520 Oakville Cross Road	26	0.000	0.61	1.38	0.020	0.34	0.79

(1) All reported crashes (includes Property Damage Only (PDO) Crashes)

Table 1 (TASAS Table B Crash Rates (January 01, 2018 – December 31, 2020) summarizes and compares the actual crash rates within the segment of combined directions of NAP 29 at 1500 Ft in either direction of the intersection at Oakville Cross Road, PM 22.520 to the average rates for similar facilities throughout the State. The Total crash rates include all reported crashes: Fatal, Injury, and Property Damage.

TASAS Table B Summary Report

Analysis of the TASAS Table B records show a total of 26 crashes within the segment of combined directions of NAP 29 at 1500 Ft in either direction of the intersection at Oakville Cross Road, PM 22.520 and study periods summarized above, with a total rate of fatal and injury crash that is above the average crash rate for similar facilities statewide, and a total crash rate that is above the average for similar facilities statewide.

TASAS TSAR Summary Report

- 8 (30.8%) Broadside,
- 7 (26.9%) Hit Object,
- 6 (23.1%) Rear End,
- 4 (15.4%) Sideswipe and ,
- 1 (3.8%) Head On.

The primary crash factors were:

- Failure to Yield,
- Improper Turn,
- Speeding,
- Influence of Alcohol and,
- Other Violations.

The Table B report identified in Table 2 was generated on December 13, 2021 and it depicts crash rates per million vehicle miles for the most recent 3 year period from 01-01-2018 to 12-31-2020 from the Traffic Accident Surveillance and Analysis System (TASAS).

TABLE 2

TASAS Table B Crash Rates (January 01, 2018 – December 31, 2020)

Segment	TOTAL No. of Crashes	ACTUAL Rates (per million vehicle miles)			AVERAGE Rates (per million vehicle miles)		
		Fatal Crashes	Fatal + Injury Crashes	Total [1]	Fatal Crashes	Fatal + Injury	Total[1]
NAP 29 PM 24.595 Rutherford Road	22	0.000	0.40	1.46	0.020	0.34	0.79

[1]All reported crashes (includes Property Damage Only (PDO) Crashes)

Table 2 (TASAS Table B Crash Rates (January 1, 2018 – December 31, 2020) summarizes and compares the actual crash rates within the segment of combined directions of NAP 29 at 1500 FT in either direction of the intersection at Rutherford Road to the average rates for similar facilities throughout the State. The Total crash rates include all reported crashes: Fatal, Injury, and Property Damage.

<u>TASAS Table B Summary Report</u>

Analysis of the TASAS Table B records shows a total of 22 crashes within the segment of combined directions of NAP 29 at 1500 FT in either direction of the intersection at Rutherford Road. and study periods summarized above, with a total rate of fatal and injury related crash rate that is above the average crash rate for similar facilities statewide, and a total crash rate that is above the average for similar facilities statewide.

TASAS TSAR Summary Report

Detailed analysis of the types of reported collisions shows that:

- 9 (40.9%) crashes were Rear End,
- 5 (22.7%) crashes were Sideswipe,
- 4 (18.2%) crashes were Hit Object,
- 2 (9.1%) crashes were Head On and,
- 2 (9.1%) crashes were Broadside,

The primary crash factors were:

- Speeding,
- Improper Turn,
- Failure to Yield and,
- Other Violations.

Analysis Conducted By:	Date
Fereshta Mojaddedi	12/8/2021
Fereshta Mojaddedi	
Approved for Release:	Date

cc: SMamoon/BZarechian/Traffic Engineering N/E

Appendix H – Alternative Exhibits

SCALE 1"=40'

FEET 0 20 40 80 120

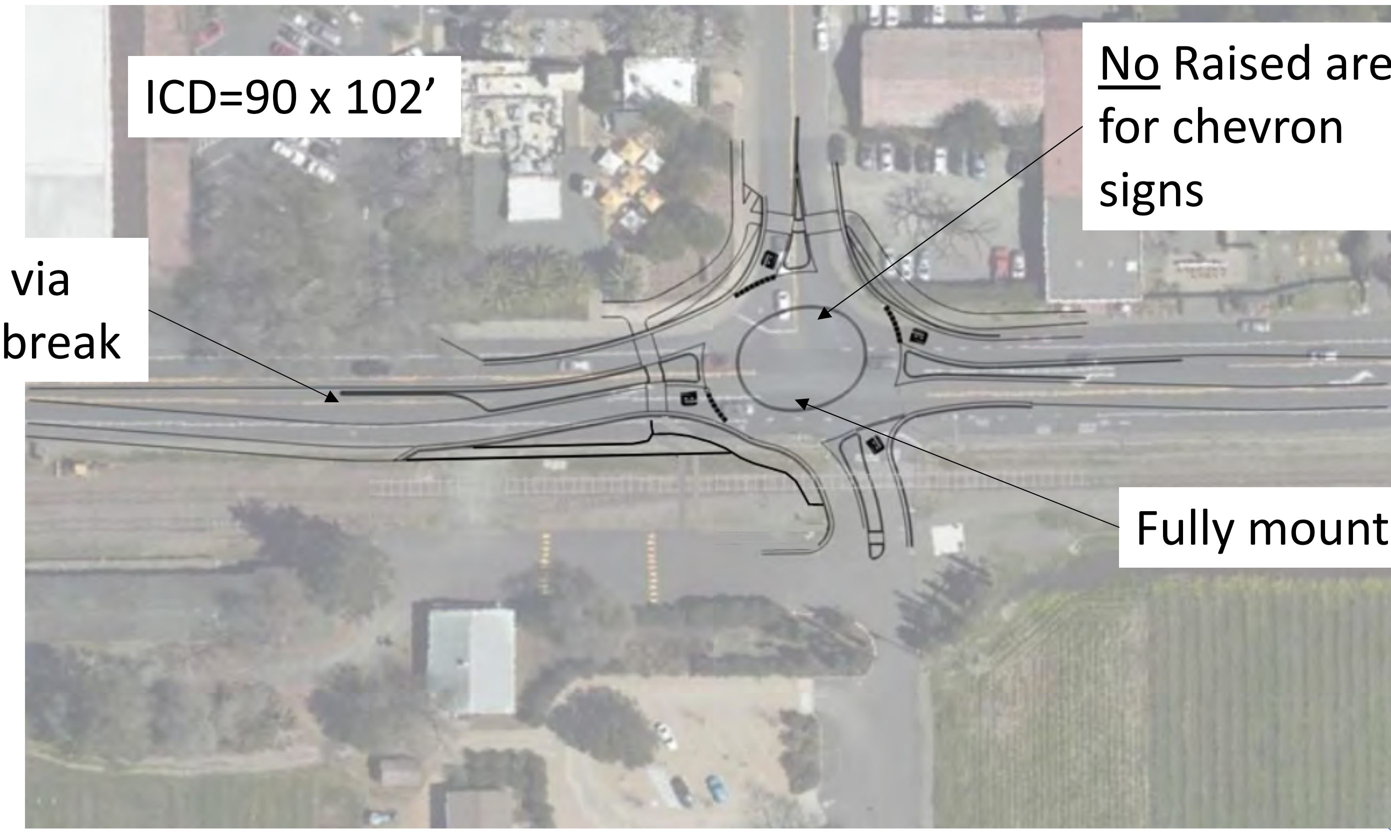
METROPOLITAN TRANSPORTATION COMMISSION

GHD

STATE ROUTE 29 (SR-29) IMPROVEMENTS AT RUTHERFORD AND OAKVILLE INTERSECTIONS PROJECT

RUTHERFORD Rd, SIGNAL OPTION
SEPT 2022

Compact Roundabout Alternative



LEGEND

- STATE R/W
- PARCEL BOUNDARY
- EASEMENT
- EXISTING RAILROAD
- PROPOSED DESIGN
- PROPOSED SIGNAL

SCALE 1"=40'

METROPOLITAN TRANSPORTATION COMMISSION

GHD

STATE ROUTE 29 (SR-29) IMPROVEMENTS AT RUTHERFORD AND OAKVILLE INTERSECTIONS PROJECT

OAKVILLE CROSS Rd, SIGNAL OPTION

SEPT 2022

SCALE 1"=40'

METROPOLITAN
TRANSPORTATION
COMMISSION

GHD

STATE ROUTE 29 (SR-29) IMPROVEMENTS AT RUTHERFORD AND OAKVILLE INTERSECTIONS PROJECT

OAKVILLE CROSS Rd

SEPT 2022

Appendix I – Cost Estimates

	Rutherford Signal with Mainline Channelization										
				Intersection		Grade Crossing		Mainline			
Item Code	Item	Unit	Unit Price	Est. Quan	Sub Total	Est. Quan	Sub Total	Est. Quan	Sub Total	Total Quan	Total Cost
190101	Roadway Excavation	CY	$ 150.00	331	$ 49,579.17	26.99	$ 4,048.61	159.63	$ 23,944.44	517	$ 77,572.22
170103	Clearing & Grubbing	LS	$ 10,000.00	1	$ 10,000.00	-	$ -	-	$ -	1	$ 10,000.00
390132	Hot Mix Asphalt (Type A)	TON	$ 250.00	330	$ 82,575.00	12.92	$ 3,229.69	64.35	$ 16,087.50	408	$ 101,892.19
260203	Class 2 Aggregate Base	CY	$ 150.00	241	$ 36,158.33	20.61	$ 3,091.67	117.48	$ 17,622.22	379	$ 56,872.22
731521	Minor Concrete (Curb, Sidewalk, and Islands)	CY	$ 900.00	47	$ 42,409.79	-	$ -	10.37	$ 9,333.33	57	$ 51,743.12
398200	Cold Plane Asphalt Concrete Pavement	SQYD	$ 23.00	2,006	$ 46,127.78	-	$ -	-	$ -	2,006	$ 46,127.78
870400	Signal and Lighting System	LS	$ 300,000.00	1	$ 300,000.00	-	$ -	-	$ -	1	$ 300,000.00
871400	Radar Speed Feedback Sign Systems (NB/SB SR-29)	LS	TBD	-		-		1.00		1	
870700	Flashing Beacon System (NB/SB SR-29 and Rutherford Rd)	LS	TBD	-		-		1.00		1	
	Reconstruction-Private Property (landscaping repair and wall…)	LS	$ 40,000.00	1	$ 40,000.00	-	$ -	-	$ -	1	$ 40,000.00
	Drainage (18"x xx')	LS	$ 35,000.00	1	$ 35,000.00	-	$ -	-	$ -	1	$ 35,000.00
	Environmental (included in contingency)	LS	$ -	1	$ -	-	$ -	-	$ -	1	$ -
	Signing and Striping (w/flashing beacons)	LS	$ 15,000.00	1	$ 15,000.00	1.00	$ 15,000.00	1.00	$ 15,000.00	3	$ 45,000.00
	Temporary Construction	LS	$ 25,000.00	1	$ 25,000.00	1.00	$ 25,000.00			2	$ 50,000.00
	Traffic Control System (signage, striping, detour, flaggers, 2 months)	LS	$ 30,000.00	1	$ 30,000.00	-	$ -	1.00	$ 70,000.00	2	$ 100,000.00
	Water Quality	LS	$ 25,000.00	1	$ 25,000.00		$ -	1.00	$ 25,000.00	2	$ 50,000.00
	Grade Crossing	LS	$ 75,000.00		$ -	1.00	$ 75,000.00		$ -	1	$ 75,000.00
	Utilities	LS	$ 45,000.00	1	$ 45,000.00						$ 45,000.00
	Misc Work Item (Not included in the above items)	LS	$ -	1	$ -		$ -		$ -	1	$ -
				Subtotal	$ 781,850.07		$ 125,369.97		$ 176,987.50		

Sub Total	$ 1,084,207.53
10% Contingency	$ 108,420.75
Total	$ 1,192,628.29

	Rutherford Compact Roundabout with Mainline Channelization										
				Intersection		Grade Crossing		Mainline			
Item Code	Item	Unit	Unit Price	Est. Quan	Sub Total	Est. Quan	Sub Total	Est. Quan	Sub Total	Total Quan	Total Cost
190101	Roadway Excavation	CY	$ 100.00	390	$ 38,990.74	-	$ -	5,631.53	$ 563,152.59	6,021	$ 602,143.33
170103	Clearing & Grubbing	LS	$ 15,000.00	1	$ 15,000.00	-	$ -	-	$ -	1	$ 15,000.00
390132	Hot Mix Asphalt (Type A)	TON	$ 150.00	259	$ 38,815.88	-	$ -	3,863.57	$ 579,534.75	4,122	$ 618,350.63
260203	Class 2 Aggregate Base	CY	$ 100.00	265	$ 26,483.70	-	$ -	4,225.27	$ 422,527.41	4,490	$ 449,011.11
731521	Minor Concrete (Curb, Sidewalk, and Islands)	CY	$ 830.00	147	$ 121,737.66		$ -	352.94	$ 292,943.77	500	$ 414,681.43
398200	Cold Plane Asphalt Concrete Pavement	SQYD	$ 4.00	2,399	$ 9,597.33		$ -	20,344.00	$ 81,376.00	22,743	$ 90,973.33
870200	Lighting System (assuming 4)	LS	$ 40,000.00	1	$ 40,000.00	-	$ -	-	$ -	1	$ 40,000.00
871400	Radar Speed Feedback Sign Systems (NB/SB SR-29)	LS	TBD	-		-		1.00		1	
870700	Flashing Beacon System (NB/SB SR-29 and Rutherford Rd)	LS	TBD	-		-		1.00		1	
	Reconstruction-Private Property (sign, lanscaping, walls…)	LS	$ 100,000.00	1	$ 100,000.00	-	$ -	-	$ -	1	$ 100,000.00
	Drainage (18"x xx')	LS	$ 50,000.00	1	$ 50,000.00	-	$ -	1.00	$ 50,000.00	2	$ 100,000.00
	Environmental	LS	$ 100,000.00	1	$ 100,000.00	-	$ -	-	$ -	1	$ 100,000.00
	Signing and Striping (w/flashing beacons)	LS	$ 10,000.00	1	$ 10,000.00	1.00	$ 10,000.00	1.00	$ 10,000.00	3	$ 30,000.00
	Temporary Construction (sliver widening 250'x5')	LS	$ 50,000.00	1	$ 50,000.00	-	$ -	1.00	$ 200,000.00	2	$ 250,000.00
	Traffic Control System (signage, striping, detour, flaggers, 2 months)	LS	$ 30,000.00	1	$ 30,000.00	-	$ -	1.00	$ 70,000.00	2	$ 100,000.00
	Water Quality	LS	$ 100,000.00	1	$ 100,000.00		$ -	1.00	$ 200,000.00	2	$ 300,000.00
	Grade Crossing	LS	$ 250,000.00		$ -	1.00	$ 250,000.00		$ -	1	$ 250,000.00
	Utilities	LS	$ 346,015.98	1	$ 346,015.98						$ 346,015.98
	Misc Work Item (Not included in the above items)	LS	$ 519,023.97	1	$ 519,023.97		$ -		$ -	1	$ 519,023.97
				Subtotal	$ 1,595,665.27		$ 260,000.00		$ 2,469,534.52		
									Sub Total		$ 4,325,199.79
									10% Contingency		$ 432,519.98
									Total		$ 4,757,719.77

Item Code	Item	Unit	Unit Price	Intersection		Grade Crossing		Mainline		Total Quan	Total Cost
	Oakville Compact Roundabout with Mainline Channelization			Est. Quan	Sub Total	Est. Quan	Sub Total	Est. Quan	Sub Total		
190101	Roadway Excavation	CY	$ 100.00	911.27	$ 91,127.22	-	$ -	1,875.95	$ 187,594.63	2,787	$ 278,721.85
170103	Clearing & Grubbing	LS	$ 15,000.00	1	$ 15,000.00	-	$ -	-	$ -	1	$ 15,000.00
390132	Hot Mix Asphalt (Type A)	TON	$ 150.00	428	$ 64,192.50	-	$ -	1,617.04	$ 242,556.19	2,045	$ 306,748.69
260203	Class 2 Aggregate Base	CY	$ 100.00	643	$ 64,258.89	-	$ -	1,327.47	$ 132,747.04	1,970	$ 197,005.93
731521	Minor Concrete (Curb, Sidewalk, and Curb Ramp)	CY	$ 830.00	643	$ 533,348.78		$ -	415.03	$ 344,478.89	1,058	$ 877,827.67
398200	Cold Plane Asphalt Concrete Pavement	SQYD	$ 4.00	2,033	$ 8,130.67		$ -	14,901.67	$ 59,606.67	16,934	$ 67,737.33
870200	Lighting System (assuming 4)	LS	$ 40,000.00	1	$ 40,000.00	-	$ -	-	$ -	1	$ 40,000.00
871400	Radar Speed Feedback Sign Systems (NB/SB SR-29)	LS	TBD	-		-		1.00		1	
870700	Flashing Beacon System (NB/SB SR-29 and Oakville Cross Rd)	LS	TBD	-		-		1.00		1	
	Reconstruction-Private Property (sign, lanscaping, walls…)	LS	$ 200,000.00	1	$ 200,000.00	-	$ -	-	$ -	1	$ 200,000.00
	Drainage (18"x xx')	LS	$ 50,000.00	1	$ 50,000.00	-	$ -	1.00	$ 50,000.00	2	$ 100,000.00
	Environmental	LS	$ 100,000.00	1	$ 100,000.00	-	$ -	-	$ -	1	$ 100,000.00
	Signing and Striping (w/flashing beacons)	LS	$ 10,000.00	1	$ 10,000.00	1.00	$ 10,000.00	1.00	$ 10,000.00	3	$ 30,000.00
	Temporary Construction (sliver widening 250'x5')	LS	$ 50,000.00	1	$ 50,000.00	-	$ -	1.00	$ 200,000.00	2	$ 250,000.00
	Traffic Control System (signage, striping, detour, flaggers, 2 months)	LS	$ 30,000.00	1	$ 30,000.00	-	$ -	1.00	$ 70,000.00	2	$ 100,000.00
	Water Quality	LS	$ 100,000.00	1	$ 100,000.00		$ -	1.00	$ 200,000.00	2	$ 300,000.00
	Grade Crossing	LS	$ 250,000.00		$ -	1.00	$ 250,000.00		$ -	1	$ 250,000.00
	Utilities	LS	$ 311,304.15	1	$ 311,304.15						$ 311,304.15
	Misc Work Item (Not included in the above items)	LS	$ 466,956.22	1	$ 466,956.22		$ -		$ -	1	$ 466,956.22
				Subtotal	$ 2,134,318.42		$ 260,000.00		$ 1,496,983.41		

Sub Total	$ 3,891,301.84
10% Contingency	$ 389,130.18
Total	$ 4,280,432.02

Appendix J – Emissions Reports

INTERSECTION SUMMARY

Site: 101 [Existing PM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	35.1 mph	35.1 mph
Travel Distance (Total)	1249.1 veh-mi/h	1498.9 pers-mi/h
Travel Time (Total)	35.6 veh-h/h	42.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.88	
Travel Time Index	8.64	
Congestion Coefficient	1.14	
Demand Flows (Total)	1978 veh/h	2373 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.872	
Practical Spare Capacity	-2.5 %	
Effective Intersection Capacity	2268 veh/h	
Control Delay (Total)	3.31 veh-h/h	3.98 pers-h/h
Control Delay (Average)	6.0 sec	6.0 sec
Control Delay (Worst Lane)	16.3 sec	
Control Delay (Worst Movement)	21.7 sec	21.7 sec
Geometric Delay (Average)	4.3 sec	
Stop-Line Delay (Average)	1.8 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	18.7 veh	
95% Back of Queue - Distance (Worst Lane)	482.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.12	
Total Effective Stops	1017 veh/h	1220 pers/h
Effective Stop Rate	0.51	0.51
Proportion Queued	0.76	0.76
Performance Index	107.6	107.6
Cost (Total)	776.01 $/h	776.01 $/h
Fuel Consumption (Total)	53.5 gal/h	
Carbon Dioxide (Total)	480.3 kg/h	
Hydrocarbons (Total)	0.041 kg/h	
Carbon Monoxide (Total)	0.580 kg/h	
NOx (Total)	0.926 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 6.6 %
Number of Iterations: 9 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.4% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	949,277 veh/y	1,139,132 pers/y
Delay	1,590 veh-h/y	1,909 pers-h/y
Effective Stops	488,047 veh/y	585,656 pers/y
Travel Distance	599,565 veh-mi/y	719,478 pers-mi/y
Travel Time	17,080 veh-h/y	20,496 pers-h/y
Cost	372,484 $/y	372,484 $/y
Fuel Consumption	25,663 gal/y	
Carbon Dioxide	230,541 kg/y	
Hydrocarbons	20 kg/y	
Carbon Monoxide	278 kg/y	

NOx	444 kg/y

INTERSECTION SUMMARY

Site: 101 [2035 PM (Site Folder: Rutherford)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values

Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.7 mph	34.7 mph
Travel Distance (Total)	1501.8 veh-mi/h	1802.2 pers-mi/h
Travel Time (Total)	43.3 veh-h/h	51.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.87	
Travel Time Index	8.53	
Congestion Coefficient	1.15	
Demand Flows (Total)	2378 veh/h	2853 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.911	
Practical Spare Capacity	-6.7 %	
Effective Intersection Capacity	2610 veh/h	
Control Delay (Total)	4.28 veh-h/h	5.14 pers-h/h
Control Delay (Average)	6.5 sec	6.5 sec
Control Delay (Worst Lane)	29.7 sec	
Control Delay (Worst Movement)	34.0 sec	34.0 sec
Geometric Delay (Average)	4.3 sec	
Stop-Line Delay (Average)	2.2 sec	
Idling Time (Average)	0.5 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	23.4 veh	
95% Back of Queue - Distance (Worst Lane)	604.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.15	
Total Effective Stops	1287 veh/h	1545 pers/h
Effective Stop Rate	0.54	0.54
Proportion Queued	0.83	0.83
Performance Index	132.4	132.4
Cost (Total)	942.90 $/h	942.90 $/h
Fuel Consumption (Total)	64.9 gal/h	
Carbon Dioxide (Total)	583.2 kg/h	
Hydrocarbons (Total)	0.050 kg/h	
Carbon Monoxide (Total)	0.703 kg/h	
NOx (Total)	1.126 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 8.5 %
Number of Iterations: 9 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.2% 1.6% 0.8%

Intersection Performance - Annual Values

Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,141,277 veh/y	1,369,532 pers/y
Delay	2,055 veh-h/y	2,466 pers-h/y
Effective Stops	617,835 veh/y	741,403 pers/y
Travel Distance	720,876 veh-mi/y	865,052 pers-mi/y
Travel Time	20,761 veh-h/y	24,914 pers-h/y
Cost	452,590 $/y	452,590 $/y
Fuel Consumption	31,161 gal/y	
Carbon Dioxide	279,917 kg/y	
Hydrocarbons	24 kg/y	
Carbon Monoxide	338 kg/y	

NOx	541 kg/y

INTERSECTION SUMMARY

Site: 101 [Existing PM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values

Performance Measure	Vehicles		Persons	
Travel Speed (Average)	35.2	mph	35.2	mph
Travel Distance (Total)	1243.2	veh-mi/h	1491.9	pers-mi/h
Travel Time (Total)	35.4	veh-h/h	42.4	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.88			
Travel Time Index	8.65			
Congestion Coefficient	1.14			
Demand Flows (Total)	1967	veh/h	2361	pers/h
Percent Heavy Vehicles (Demand)	4.0	%		
Degree of Saturation	0.917			
Practical Spare Capacity	-7.3	%		
Effective Intersection Capacity	2145	veh/h		
Control Delay (Total)	3.31	veh-h/h	3.97	pers-h/h
Control Delay (Average)	6.1	sec	6.1	sec
Control Delay (Worst Lane)	20.3	sec		
Control Delay (Worst Movement)	24.8	sec	24.8	sec
Geometric Delay (Average)	4.2	sec		
Stop-Line Delay (Average)	1.9	sec		
Idling Time (Average)	0.2	sec		
Intersection Level of Service (LOS)	LOS A			
95% Back of Queue - Vehicles (Worst Lane)	24.6	veh		
95% Back of Queue - Distance (Worst Lane)	634.8	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.16			
Total Effective Stops	965	veh/h	1158	pers/h
Effective Stop Rate	0.49		0.49	
Proportion Queued	0.75		0.75	
Performance Index	118.1		118.1	
Cost (Total)	770.43	$/h	770.43	$/h
Fuel Consumption (Total)	53.0	gal/h		
Carbon Dioxide (Total)	476.0	kg/h		
Hydrocarbons (Total)	0.041	kg/h		
Carbon Monoxide (Total)	0.575	kg/h		
NOx (Total)	0.917	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 7.6 %
Number of Iterations: 9 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.5% 1.3% 0.6%

Intersection Performance - Annual Values

Performance Measure	Vehicles		Persons	
Demand Flows (Total)	944,337	veh/y	1,133,204	pers/y
Delay	1,587	veh-h/y	1,905	pers-h/y
Effective Stops	463,228	veh/y	555,874	pers/y
Travel Distance	596,750	veh-mi/y	716,100	pers-mi/y
Travel Time	16,974	veh-h/y	20,369	pers-h/y
Cost	369,805	$/y	369,805	$/y
Fuel Consumption	25,434	gal/y		
Carbon Dioxide	228,487	kg/y		
Hydrocarbons	20	kg/y		
Carbon Monoxide	276	kg/y		

NOx	440 kg/y

INTERSECTION SUMMARY

Site: 101 [2035 PM (Site Folder: Oakville Cross)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values

Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.9 mph	34.9 mph
Travel Distance (Total)	1509.9 veh-mi/h	1811.9 pers-mi/h
Travel Time (Total)	43.3 veh-h/h	51.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.87	
Travel Time Index	8.58	
Congestion Coefficient	1.15	
Demand Flows (Total)	2389 veh/h	2867 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.976	
Practical Spare Capacity	-12.9 %	
Effective Intersection Capacity	2449 veh/h	
Control Delay (Total)	5.22 veh-h/h	6.27 pers-h/h
Control Delay (Average)	7.9 sec	7.9 sec
Control Delay (Worst Lane)	33.3 sec	
Control Delay (Worst Movement)	37.5 sec	37.5 sec
Geometric Delay (Average)	4.2 sec	
Stop-Line Delay (Average)	3.7 sec	
Idling Time (Average)	0.6 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	36.1 veh	
95% Back of Queue - Distance (Worst Lane)	932.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.23	
Total Effective Stops	1318 veh/h	1582 pers/h
Effective Stop Rate	0.55	0.55
Proportion Queued	0.77	0.77
Performance Index	160.4	160.4
Cost (Total)	941.54 $/h	941.54 $/h
Fuel Consumption (Total)	64.6 gal/h	
Carbon Dioxide (Total)	580.7 kg/h	
Hydrocarbons (Total)	0.050 kg/h	
Carbon Monoxide (Total)	0.701 kg/h	
NOx (Total)	1.118 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 8.6 %
Number of Iterations: 9 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.8% 1.4% 0.7%

Intersection Performance - Annual Values

Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,146,948 veh/y	1,376,337 pers/y
Delay	2,506 veh-h/y	3,008 pers-h/y
Effective Stops	632,722 veh/y	759,267 pers/y
Travel Distance	724,765 veh-mi/y	869,718 pers-mi/y
Travel Time	20,764 veh-h/y	24,917 pers-h/y
Cost	451,939 $/y	451,939 $/y
Fuel Consumption	31,029 gal/y	
Carbon Dioxide	278,747 kg/y	
Hydrocarbons	24 kg/y	
Carbon Monoxide	337 kg/y	

NOx	537 kg/y

INTERSECTION SUMMARY

Site: 101v [Existing PM - TWSC (Site Folder: Rutherford - Emissions)]

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	8.0 mph	8.0 mph
Travel Distance (Total)	1217.7 veh-mi/h	1461.3 pers-mi/h
Travel Time (Total)	152.5 veh-h/h	183.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.20	
Travel Time Index	1.11	
Congestion Coefficient	5.01	
Demand Flows (Total)	1978 veh/h	2373 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	12.143	
Practical Spare Capacity	-93.4 %	
Effective Intersection Capacity	163 veh/h	
Control Delay (Total)	110.20 veh-h/h	132.24 pers-h/h
Control Delay (Average)	200.6 sec	200.6 sec
Control Delay (Worst Lane)	5263.3 sec	
Control Delay (Worst Movement)	5263.7 sec	5263.7 sec
Geometric Delay (Average)	1.1 sec	
Stop-Line Delay (Average)	199.5 sec	
Idling Time (Average)	215.4 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	51.9 veh	
95% Back of Queue - Distance (Worst Lane)	1338.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.34	
Total Effective Stops	277 veh/h	333 pers/h
Effective Stop Rate	0.14	0.14
Proportion Queued	0.09	0.09
Performance Index	230.1	230.1
Cost (Total)	2522.19 $/h	2522.19 $/h
Fuel Consumption (Total)	76.1 gal/h	
Carbon Dioxide (Total)	682.8 kg/h	
Hydrocarbons (Total)	0.077 kg/h	
Carbon Monoxide (Total)	0.686 kg/h	
NOx (Total)	0.745 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 2.0 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.6% 1.7% 0.8%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	949,277 veh/y	1,139,132 pers/y
Delay	52,897 veh-h/y	63,476 pers-h/y
Effective Stops	133,196 veh/y	159,835 pers/y
Travel Distance	584,508 veh-mi/y	701,410 pers-mi/y
Travel Time	73,193 veh-h/y	87,831 pers-h/y
Cost	1,210,650 $/y	1,210,650 $/y
Fuel Consumption	36,535 gal/y	
Carbon Dioxide	327,741 kg/y	
Hydrocarbons	37 kg/y	
Carbon Monoxide	329 kg/y	

NOx	357 kg/y

INTERSECTION SUMMARY

Site: 101v [2035 PM - TWSC (Site Folder: Rutherford - Emissions)]

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	6.9 mph	6.9 mph
Travel Distance (Total)	1464.0 veh-mi/h	1756.8 pers-mi/h
Travel Time (Total)	212.0 veh-h/h	254.4 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.17	
Travel Time Index	0.81	
Congestion Coefficient	5.79	
Demand Flows (Total)	2378 veh/h	2853 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	14.184	
Practical Spare Capacity	-94.4 %	
Effective Intersection Capacity	168 veh/h	
Control Delay (Total)	161.67 veh-h/h	194.01 pers-h/h
Control Delay (Average)	244.8 sec	244.8 sec
Control Delay (Worst Lane)	6118.2 sec	
Control Delay (Worst Movement)	6121.2 sec	6121.2 sec
Geometric Delay (Average)	1.2 sec	
Stop-Line Delay (Average)	243.6 sec	
Idling Time (Average)	263.1 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	57.0 veh	
95% Back of Queue - Distance (Worst Lane)	1470.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.37	
Total Effective Stops	374 veh/h	449 pers/h
Effective Stop Rate	0.16	0.16
Proportion Queued	0.11	0.11
Performance Index	336.7	336.7
Cost (Total)	3487.23 $/h	3487.23 $/h
Fuel Consumption (Total)	102.2 gal/h	
Carbon Dioxide (Total)	916.5 kg/h	
Hydrocarbons (Total)	0.110 kg/h	
Carbon Monoxide (Total)	0.988 kg/h	
NOx (Total)	0.967 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.3 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.5% 1.7% 0.8%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	1,141,277 veh/y	1,369,532 pers/y
Delay	77,603 veh-h/y	93,123 pers-h/y
Effective Stops	179,517 veh/y	215,420 pers/y
Travel Distance	702,729 veh-mi/y	843,274 pers-mi/y
Travel Time	101,745 veh-h/y	122,095 pers-h/y
Cost	1,673,871 $/y	1,673,871 $/y
Fuel Consumption	49,062 gal/y	
Carbon Dioxide	439,933 kg/y	
Hydrocarbons	53 kg/y	
Carbon Monoxide	474 kg/y	

NOx	464 kg/y

INTERSECTION SUMMARY

Site: 101v [Existing PM - Signal (Site Folder: Rutherford - Emissions)]

New Site
Site Category: (None)
Signals - EQUISAT (Pretimed) Isolated   Cycle Time = 145 seconds (Site User-Given Cycle Time)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	30.1 mph	30.1 mph
Travel Distance (Total)	1217.9 veh-mi/h	1461.5 pers-mi/h
Travel Time (Total)	40.5 veh-h/h	48.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.75	
Travel Time Index	7.24	
Congestion Coefficient	1.33	
Demand Flows (Total)	1978 veh/h	2373 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.755	
Practical Spare Capacity	19.3 %	
Effective Intersection Capacity	2621 veh/h	
Control Delay (Total)	9.88 veh-h/h	11.86 pers-h/h
Control Delay (Average)	18.0 sec	18.0 sec
Control Delay (Worst Lane)	84.9 sec	
Control Delay (Worst Movement)	85.0 sec	85.0 sec
Geometric Delay (Average)	0.9 sec	
Stop-Line Delay (Average)	17.1 sec	
Idling Time (Average)	14.3 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	43.9 veh	
95% Back of Queue - Distance (Worst Lane)	1132.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.21	
Total Effective Stops	1064 veh/h	1276 pers/h
Effective Stop Rate	0.54	0.54
Proportion Queued	0.57	0.57
Performance Index	212.8	212.8
Cost (Total)	821.51 $/h	821.51 $/h
Fuel Consumption (Total)	49.0 gal/h	
Carbon Dioxide (Total)	440.7 kg/h	
Hydrocarbons (Total)	0.038 kg/h	
Carbon Monoxide (Total)	0.551 kg/h	
NOx (Total)	0.758 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 24.4%   0.0%   0.0%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	949,277 veh/y	1,139,132 pers/y
Delay	4,743 veh-h/y	5,692 pers-h/y
Effective Stops	510,585 veh/y	612,702 pers/y
Travel Distance	584,593 veh-mi/y	701,512 pers-mi/y
Travel Time	19,451 veh-h/y	23,341 pers-h/y
Cost	394,324 $/y	394,324 $/y
Fuel Consumption	23,538 gal/y	
Carbon Dioxide	211,543 kg/y	
Hydrocarbons	18 kg/y	
Carbon Monoxide	264 kg/y	
NOx	364 kg/y	

INTERSECTION SUMMARY

Site: 101v [2035 PM - Signal (Site Folder: Rutherford - Emissions)]

New Site
Site Category: (None)
Signals - EQUISAT (Pretimed) Isolated   Cycle Time = 145 seconds (Site User-Given Cycle Time)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	22.0 mph	22.0 mph
Travel Distance (Total)	1464.2 veh-mi/h	1757.1 pers-mi/h
Travel Time (Total)	66.6 veh-h/h	80.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.55	
Travel Time Index	4.99	
Congestion Coefficient	1.82	
Demand Flows (Total)	2378 veh/h	2853 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	1.041	
Practical Spare Capacity	-13.5 %	
Effective Intersection Capacity	2284 veh/h	
Control Delay (Total)	29.72 veh-h/h	35.66 pers-h/h
Control Delay (Average)	45.0 sec	45.0 sec
Control Delay (Worst Lane)	125.0 sec	
Control Delay (Worst Movement)	125.0 sec	125.0 sec
Geometric Delay (Average)	1.0 sec	
Stop-Line Delay (Average)	44.0 sec	
Idling Time (Average)	38.9 sec	
Intersection Level of Service (LOS)	LOS D	
95% Back of Queue - Vehicles (Worst Lane)	94.8 veh	
95% Back of Queue - Distance (Worst Lane)	2446.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.94	
Total Effective Stops	2042 veh/h	2451 pers/h
Effective Stop Rate	0.86	0.86
Proportion Queued	0.81	0.81
Performance Index	403.3	403.3
Cost (Total)	1301.51 $/h	1301.51 $/h
Fuel Consumption (Total)	71.2 gal/h	
Carbon Dioxide (Total)	639.6 kg/h	
Hydrocarbons (Total)	0.060 kg/h	
Carbon Monoxide (Total)	0.749 kg/h	
NOx (Total)	1.126 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 1.9 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 2.4%   2.3%   1.1%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	1,141,277 veh/y	1,369,532 pers/y
Delay	14,265 veh-h/y	17,118 pers-h/y
Effective Stops	980,221 veh/y	1,176,265 pers/y
Travel Distance	702,832 veh-mi/y	843,398 pers-mi/y
Travel Time	31,985 veh-h/y	38,382 pers-h/y
Cost	624,723 $/y	624,723 $/y
Fuel Consumption	34,190 gal/y	
Carbon Dioxide	306,989 kg/y	
Hydrocarbons	29 kg/y	
Carbon Monoxide	359 kg/y	
NOx	540 kg/y	

INTERSECTION SUMMARY

Site: 101v [Existing PM - TWSC (Site Folder: Oakville Cross - Emissions)]

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	8.6 mph	8.6 mph
Travel Distance (Total)	1211.5 veh-mi/h	1453.9 pers-mi/h
Travel Time (Total)	140.7 veh-h/h	168.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.22	
Travel Time Index	1.28	
Congestion Coefficient	4.65	
Demand Flows (Total)	1967 veh/h	2361 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	11.579	
Practical Spare Capacity	-93.1 %	
Effective Intersection Capacity	170 veh/h	
Control Delay (Total)	100.56 veh-h/h	120.67 pers-h/h
Control Delay (Average)	184.0 sec	184.0 sec
Control Delay (Worst Lane)	4972.4 sec	
Control Delay (Worst Movement)	4974.9 sec	4974.9 sec
Geometric Delay (Average)	0.8 sec	
Stop-Line Delay (Average)	183.3 sec	
Idling Time (Average)	200.5 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	47.0 veh	
95% Back of Queue - Distance (Worst Lane)	1212.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.30	
Total Effective Stops	190 veh/h	228 pers/h
Effective Stop Rate	0.10	0.10
Proportion Queued	0.07	0.07
Performance Index	225.7	225.7
Cost (Total)	2336.81 $/h	2336.81 $/h
Fuel Consumption (Total)	72.0 gal/h	
Carbon Dioxide (Total)	646.0 kg/h	
Hydrocarbons (Total)	0.074 kg/h	
Carbon Monoxide (Total)	0.722 kg/h	
NOx (Total)	0.695 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 1.3 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.2% 1.1% 0.5%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	944,337 veh/y	1,133,204 pers/y
Delay	48,268 veh-h/y	57,921 pers-h/y
Effective Stops	91,196 veh/y	109,435 pers/y
Travel Distance	581,542 veh-mi/y	697,850 pers-mi/y
Travel Time	67,545 veh-h/y	81,054 pers-h/y
Cost	1,121,669 $/y	1,121,669 $/y
Fuel Consumption	34,560 gal/y	
Carbon Dioxide	310,063 kg/y	
Hydrocarbons	36 kg/y	
Carbon Monoxide	346 kg/y	

NOx	334 kg/y

INTERSECTION SUMMARY

Site: 101v [2035 PM - TWSC (Site Folder: Oakville Cross - Emissions)]

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	5.4 mph	5.4 mph
Travel Distance (Total)	1471.5 veh-mi/h	1765.8 pers-mi/h
Travel Time (Total)	274.7 veh-h/h	329.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.13	
Travel Time Index	0.38	
Congestion Coefficient	7.47	
Demand Flows (Total)	2389 veh/h	2867 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	16.667	
Practical Spare Capacity	-95.2 %	
Effective Intersection Capacity	143 veh/h	
Control Delay (Total)	222.09 veh-h/h	266.50 pers-h/h
Control Delay (Average)	334.6 sec	334.6 sec
Control Delay (Worst Lane)	7192.5 sec	
Control Delay (Worst Movement)	7195.5 sec	7195.5 sec
Geometric Delay (Average)	0.9 sec	
Stop-Line Delay (Average)	333.7 sec	
Idling Time (Average)	356.4 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	64.7 veh	
95% Back of Queue - Distance (Worst Lane)	1668.1 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.42	
Total Effective Stops	283 veh/h	339 pers/h
Effective Stop Rate	0.12	0.12
Proportion Queued	0.09	0.09
Performance Index	416.1	416.1
Cost (Total)	4463.82 $/h	4463.82 $/h
Fuel Consumption (Total)	121.9 gal/h	
Carbon Dioxide (Total)	1092.8 kg/h	
Hydrocarbons (Total)	0.137 kg/h	
Carbon Monoxide (Total)	1.140 kg/h	
NOx (Total)	1.068 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 1.5 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.7% 1.3% 0.6%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	1,146,947 veh/y	1,376,337 pers/y
Delay	106,601 veh-h/y	127,921 pers-h/y
Effective Stops	135,768 veh/y	162,922 pers/y
Travel Distance	706,333 veh-mi/y	847,600 pers-mi/y
Travel Time	131,851 veh-h/y	158,221 pers-h/y
Cost	2,142,634 $/y	2,142,634 $/y
Fuel Consumption	58,529 gal/y	
Carbon Dioxide	524,556 kg/y	
Hydrocarbons	66 kg/y	
Carbon Monoxide	547 kg/y	

NOx	513 kg/y

INTERSECTION SUMMARY

Site: 101v [Existing PM - Signal (Site Folder: Oakville Cross - Emissions)]

New Site
Site Category: (None)
Signals - EQUISAT (Pretimed) Isolated   Cycle Time = 145 seconds (Site User-Given Cycle Time)

Intersection Performance - Hourly Values

Performance Measure	Vehicles	Persons
Travel Speed (Average)	31.0 mph	31.0 mph
Travel Distance (Total)	1211.5 veh-mi/h	1453.9 pers-mi/h
Travel Time (Total)	39.1 veh-h/h	46.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.77	
Travel Time Index	7.50	
Congestion Coefficient	1.29	
Demand Flows (Total)	1967 veh/h	2361 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.820	
Practical Spare Capacity	9.8 %	
Effective Intersection Capacity	2400 veh/h	
Control Delay (Total)	8.68 veh-h/h	10.42 pers-h/h
Control Delay (Average)	15.9 sec	15.9 sec
Control Delay (Worst Lane)	87.3 sec	
Control Delay (Worst Movement)	87.3 sec	87.3 sec
Geometric Delay (Average)	0.6 sec	
Stop-Line Delay (Average)	15.3 sec	
Idling Time (Average)	12.5 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	51.3 veh	
95% Back of Queue - Distance (Worst Lane)	1323.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.51	
Total Effective Stops	1063 veh/h	1275 pers/h
Effective Stop Rate	0.54	0.54
Proportion Queued	0.59	0.59
Performance Index	223.8	223.8
Cost (Total)	797.18 $/h	797.18 $/h
Fuel Consumption (Total)	48.2 gal/h	
Carbon Dioxide (Total)	433.3 kg/h	
Hydrocarbons (Total)	0.038 kg/h	
Carbon Monoxide (Total)	0.543 kg/h	
NOx (Total)	0.746 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 31.9%   12.0%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles	Persons
Demand Flows (Total)	944,337 veh/y	1,133,204 pers/y
Delay	4,169 veh-h/y	5,003 pers-h/y
Effective Stops	510,196 veh/y	612,235 pers/y
Travel Distance	581,542 veh-mi/y	697,850 pers-mi/y
Travel Time	18,762 veh-h/y	22,515 pers-h/y
Cost	382,646 $/y	382,646 $/y
Fuel Consumption	23,138 gal/y	
Carbon Dioxide	207,967 kg/y	
Hydrocarbons	18 kg/y	
Carbon Monoxide	261 kg/y	
NOx	358 kg/y	

INTERSECTION SUMMARY

Site: 101v [2035 PM - Signal (Site Folder: Oakville Cross - Emissions)]

New Site
Site Category: (None)
Signals - EQUISAT (Pretimed) Isolated Cycle Time = 145 seconds (Site User-Given Cycle Time)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	24.9 mph	24.9 mph
Travel Distance (Total)	1471.5 veh-mi/h	1765.8 pers-mi/h
Travel Time (Total)	59.2 veh-h/h	71.1 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.62	
Travel Time Index	5.79	
Congestion Coefficient	1.61	
Demand Flows (Total)	2389 veh/h	2867 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	1.017	
Practical Spare Capacity	-11.5 %	
Effective Intersection Capacity	2349 veh/h	
Control Delay (Total)	22.22 veh-h/h	26.67 pers-h/h
Control Delay (Average)	33.5 sec	33.5 sec
Control Delay (Worst Lane)	114.6 sec	
Control Delay (Worst Movement)	114.9 sec	114.9 sec
Geometric Delay (Average)	0.7 sec	
Stop-Line Delay (Average)	32.8 sec	
Idling Time (Average)	28.3 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	99.2 veh	
95% Back of Queue - Distance (Worst Lane)	2559.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.98	
Total Effective Stops	1900 veh/h	2280 pers/h
Effective Stop Rate	0.80	0.80
Proportion Queued	0.78	0.78
Performance Index	391.5	391.5
Cost (Total)	1179.84 $/h	1179.84 $/h
Fuel Consumption (Total)	67.7 gal/h	
Carbon Dioxide (Total)	608.4 kg/h	
Hydrocarbons (Total)	0.055 kg/h	
Carbon Monoxide (Total)	0.725 kg/h	
NOx (Total)	1.078 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 38.1% 20.2% 0.0%

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	1,146,947 veh/y	1,376,337 pers/y
Delay	10,667 veh-h/y	12,801 pers-h/y
Effective Stops	912,039 veh/y	1,094,447 pers/y
Travel Distance	706,333 veh-mi/y	847,600 pers-mi/y
Travel Time	28,421 veh-h/y	34,106 pers-h/y
Cost	566,325 $/y	566,325 $/y
Fuel Consumption	32,515 gal/y	
Carbon Dioxide	292,024 kg/y	
Hydrocarbons	27 kg/y	
Carbon Monoxide	348 kg/y	
NOx	517 kg/y	

Appendix K – ICE Calculations

Summary of Life Cycle Cost Analyses: Roundabout and Signal Alternatives - Rutherford

Annual Costs	Roundabout Alternative		Traffic Signal Alternative		No Build Alternative	
Safety	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**
	Annual Costs of Predicted Crashes	**$ 112,986**	Annual Costs of Predicted Crashes	**$ 1,532,309**	Annual Costs of Predicted Crashes	**$ 172,687**
Delay	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**
Average Annual Person (in Vehicle) Delay	1720	**$ 26,000**	9793	**$ 139,000**	8724	**$ 120,000**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ 1,000		
Annual Cost of Power for Signal		$ -	Power for Signal	$ 750		
Annual Cost of Illumination	Intersection Illumination	$ 750	Intersection Illumination	$ 750		
Annual Cost of Maintenance	Landscaping Costs	$ 1,500	Signal Maintenance Costs (power outage, detection, etc.)	$ 1,500	Intersection Illumination	$ 1,500
	Total Annual Operation and Maintenance Costs	**$ 2,250**	Total Annual Operation and Maintenance Costs	**$ 4,000**	Total Annual Operation and Maintenance Costs	**$ 1,500**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering						$ -
Right-of-way and Utilities						$ -
Construction		**$ 4,757,719**		**$ 1,192,628**		**$ -**

***Delay cost is based upon an average of the AM and PM peak hours.**

Total Discounted Life Cycle Costs (2020 - 2035)	Roundabout Alternative		Traffic Signal Alternative		No Build Alternative	
Safety	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**
	Total Costs of Predicted Crashes	**$1,256,222**	Total Costs of Predicted Crashes	**$17,036,800**	Total Costs of Predicted Crashes	**$42,785,600**
Delay	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**
Total Person (in Vehicle) Delay		**$ 410,000**		**$ 2,220,000**		**$ 1,920,000**
Fuel and GHG Cost	**Fuel and Green House Gas Cost**		**Fuel and Green House Gas Cost**		**Fuel and Green House Gas Cost**	
Total Fuel and GHG Costs		**$ 1,502,342**		**$ 1,502,344**		**$ 2,175,442**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
		$ -	Signal Retiming Every 3 Years	$ 11,118	Signal Retiming Every 3 Years	$ -
		$ -	Power for Signal	$ 8,339	Power for Signal	$ -
	Intersection Illumination	$ 8,339	Intersection Illumination	$ 8,339	Intersection Illumination	$ -
	Landscaping Costs	$ 16,678	Signal Maintenance Costs (power outage, detection, etc.)	$ 16,678	Signal Maintenance Costs (power outage, detection, etc.)	$ 16,678
	Total Annual Operation and Maintenance Costs	**$ 25,016**	Total Annual Operation and Maintenance Costs	**$ 44,474**	Total Annual Operation and Maintenance Costs	**$ 16,678**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -		$ -
Right-of-way and Utilities		$ -		$ -		$ -
Construction		$ 4,758,000		$ 1,193,000		$ -
	Total Initial Capital Costs	**$ 4,758,000**	Total Initial Capital Costs	**$ 1,193,000**	Total Initial Capital Costs	**$ -**
Total Life Cycle Costs (Opening Year $)	**Net Present Value**	**$ 7,952,000**	**Net Present Value**	**$ 21,997,000**	**Net Present Value**	**$ 46,898,000**

***Delay cost is based upon an average of the AM and PM peak hours.**

Comparative Summary: Roundabout to Signal To Existing TWSC

Life Cycle Costs (20 year design)	Roundabout Alternative	Traffic Signal Alternative	No Build Alternative
Collision and Mobility Costs			
Collision Costs of predicted crashes [2]	$1,257,000	$17,037,000	$42,786,000
Delay Costs	$410,000	$2,220,000	$1,920,000
Fuel and GHG Costs	$1,503,000	$1,503,000	$2,176,000
Project Costs Including Design, Construction and Maintenance			
Operations and Maintenance Costs	$26,000	$45,000	$17,000
Project Costs (including soft costs) [3]	$4,758,000	$1,193,000	$0
Total Life Cycle Costs	**$7,954,000**	**$21,998,000**	**$46,899,000**

Notes:

1. Existing geometry is analyzed for the PM peak hour traffic volumes of the Ultimate Design Year.

2. The collision costs presented within this table were derived using the Caltrans tool for Intersection Control Evaluation Collision Cost Analysis

3. To improve safety at the existing intersection, an exlusive northbound left turn pocket needs to be included. The cost of such an improvement is not included within this report as it is beyond the scope of the ICE analysis. However, it should be noted, that the inclusion of this cost would only result in the increase in the Total Life Cycle Cost.

Summary of Life Cycle Cost Analyses: Roundabout and Signal Alternatives - Oakville Cross

Annual Costs	Roundabout Alternative		Traffic Signal Alternative		No Build Alternative	
Safety	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**
	Annual Costs of Predicted Crashes	**$ 134,463**	Annual Costs of Predicted Crashes	**$ 1,823,574**	Annual Costs of Predicted Crashes	**$ 149,302**
Delay	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**
Average Annual Person (in Vehicle) Delay	2238	**$ 33,000**	10462	**$ 147,000**	7532	**$ 104,000**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ 1,000		
Annual Cost of Power for Signal		$ -	Power for Signal	$ 750		
Annual Cost of Illumination	Intersection Illumination	$ 750	Intersection Illumination	$ 750		
Annual Cost of Maintenance	Landscaping Costs	$ 1,500	Signal Maintenance Costs (power outage, detection, etc.)	$ 1,500	Intersection Illumination	$ 1,500
	Total Annual Operation and Maintenance Costs	**$ 2,250**	Total Annual Operation and Maintenance Costs	**$ 4,000**	Total Annual Operation and Maintenance Costs	**$ 1,500**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering						$ -
Right-of-way and Utilities						$ -
Construction		**$ 4,280,432**		**$ 1,192,628**		**$ -**

***Delay cost is based upon an average of the AM and PM peak hours.**

Total Discounted Life Cycle Costs (2020 - 2035)	Roundabout Alternative		Traffic Signal Alternative		No Build Alternative	
Safety	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**
	Total Costs of Predicted Crashes	**$1,495,008**	Total Costs of Predicted Crashes	**$20,275,200**	Total Costs of Predicted Crashes	**$50,918,400**
Delay	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**
Total Person (in Vehicle) Delay		**$ 520,000**		**$ 2,350,000**		**$ 1,660,000**
Fuel and GHG Cost	**Fuel and Green House Gas Cost**		**Fuel and Green House Gas Cost**		**Fuel and Green House Gas Cost**	
Total Fuel and GHG Costs		**$ 1,491,340**		**$ 1,450,336**		**$ 2,337,489**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
		$ -	Signal Retiming Every 3 Years	$ 11,118	Signal Retiming Every 3 Years	$ -
		$ -	Power for Signal	$ 8,339	Power for Signal	$ -
	Intersection Illumination	$ 8,339	Intersection Illumination	$ 8,339	Intersection Illumination	$ -
	Landscaping Costs	$ 16,678	Signal Maintenance Costs (power outage, detection, etc.)	$ 16,678	Signal Maintenance Costs (power outage, detection, etc.)	$ 16,678
	Total Annual Operation and Maintenance Costs	**$ 25,016**	Total Annual Operation and Maintenance Costs	**$ 44,474**	Total Annual Operation and Maintenance Costs	**$ 16,678**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -		$ -
Right-of-way and Utilities		$ -		$ -		$ -
Construction		$ 4,281,000		$ 1,193,000		$ -
	Total Initial Capital Costs	**$ 4,281,000**	Total Initial Capital Costs	**$ 1,193,000**	Total Initial Capital Costs	**$ -**
Total Life Cycle Costs (Opening Year $)	**Net Present Value**	**$ 7,813,000**	**Net Present Value**	**$ 25,314,000**	**Net Present Value**	**$ 54,933,000**

***Delay cost is based upon an average of the AM and PM peak hours.**

Comparative Summary: Roundabout to Signal To Existing TWSC

Life Cycle Costs (20 year design)	Roundabout Alternative	Traffic Signal Alternative	No Build Alternative
Collision and Mobility Costs			
Collision Costs of predicted crashes [2]	$1,496,000	$20,276,000	$50,919,000
Delay Costs	$520,000	$2,350,000	$1,660,000
Fuel and GHG Costs	$1,492,000	$1,451,000	$2,338,000
Project Costs Including Design, Construction and Maintenance			
Operations and Maintenance Costs	$26,000	$45,000	$17,000
Project Costs (including soft costs) [3]	$4,281,000	$1,193,000	$0
Total Life Cycle Costs	**$7,815,000**	**$25,315,000**	**$54,934,000**

Notes:
1. Existing geometry is analyzed for the PM peak hour traffic volumes of the Ultimate Design Year.
2. The collision costs presented within this table were derived using the Caltrans tool for Intersection Control Evaluation Collision Cost Analysis
3. To improve safety at the existing intersection, an exlusive northbound left turn pocket needs to be included. The cost of such an improvement is not included within this report as it is beyond the scope of the ICE analysis. However, it should be noted, that the inclusion of this cost would only result in the increase in the Total Life Cycle Cost.

Appendix L: Kimley Horn Study

Napa County SR-29 and Silverado Trail Intersection Improvements

Deliverable 2.2: Final Existing Conditions Memorandum

September 9, 2019

Prepared for:

Prepared by:

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Appendix A: Turning Movement Counts
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1 INTRODUCTION

State Route 29 (SR-29) and Silverado Trail are major north-south corridors located in the County of Napa. These corridors provide access to commercial and residential land uses within the County of Napa. SR-29 connects to Solano County and Lake County while Silverado Trail connects to the cities of Napa and Calistoga and serves as an alternate route to SR-29 between the two cities. SR-29 between Whitehall Lane and Oakville Cross Road and Silverado Trail between SR-128/Conn Creek Road and Oakville Cross Road are currently experiencing congestion in the southbound direction during the PM peak period. In addition, many of the side-street stop-controlled intersection approaches along the corridor have been observed to have difficulty turning onto SR-29 and Silverado Trail.

This study assesses the existing conditions of the two corridors to determine the causes of the congestion and to develop potential near-term improvements to improve operations.

The Existing Conditions report summarizes the following:

- Description of the existing roadway, bicycle, pedestrian, and transit facilities within the study area as well as the existing roadway geometry and traffic volumes
- Analysis of the gap study and field observations used to calibrate the Synchro models
- Comparison between INRIX travel times and SimTraffic arterial travel times
- Existing conditions intersection level of service and queuing analysis

1.1 Study Area

The project study limits are SR-29 from SR-128/Rutherford Road to Oakville Cross Road and Silverado Trail from Conn Creek Road to Skellenger Lane. To assess the existing conditions of the southbound PM peak period traffic conditions, the following side-street stop-controlled intersections located within the study area were selected for evaluation:

1. SR-29 at SR-128/Rutherford Road
2. SR-29 at Robert Mondavi Winery Driveway
3. SR-29 at Oakville Grocery Driveway
4. SR-29 at Oakville Cross Road
5. Silverado Trail at SR-128/Conn Creek Road
6. Silverado Trail at SR-128/Sage Canyon Road
7. Silverado Trail at Skellenger Lane

Figure 1 shows the study limits and intersections.

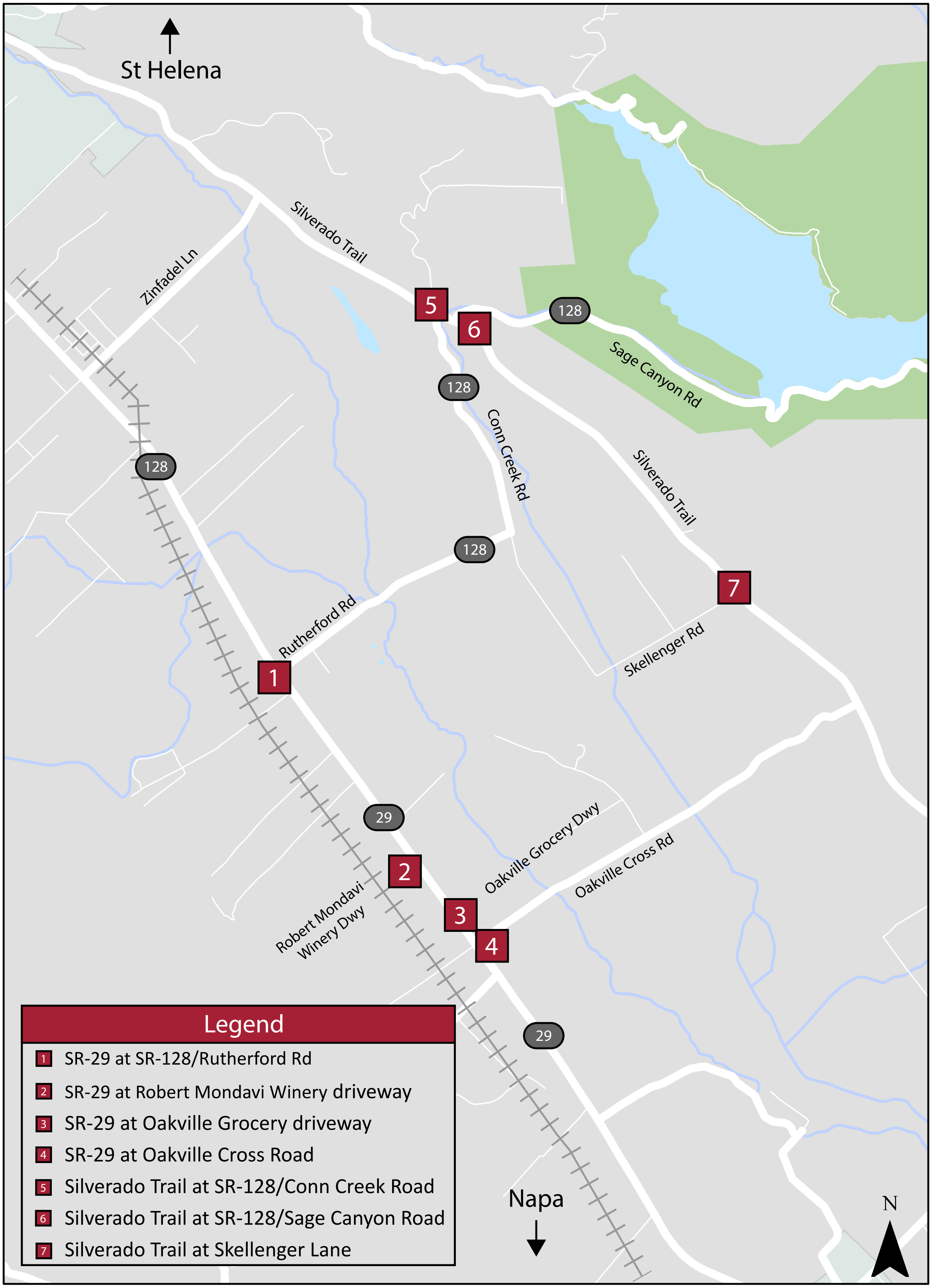

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FIGURE 1

STUDY AREA VICINITY MAP

1.2 Data Collection

Traffic count data was collected for all of the listed intersections within the study area. Weekday intersection turning movement volumes were collected at all study area intersections on a Tuesday, Wednesday, and Thursday from May 21, 2019 to May 23, 2019. Volumes were collected during the PM peak period between 3:30 PM and 6:30 PM. Bicycle and pedestrian counts were also collected as part of the traffic count data collection task. Volume data sheets for all traffic counts are provided in the **Appendix**.

Kimley-Horn performed site visits to observe corridor conditions in the evening peak hours, documented existing intersection lane geometries, performed gap studies, and identified potential causes of the congestion.

1.3 Analysis Methodology

Kimley-Horn analyzed the Level of Service (LOS) and delay at each of the study intersections along SR-29 and Silverado Trail under existing conditions. The existing traffic analysis was performed for the weekday PM peak hour conditions.

All study intersections were analyzed using procedures and methodologies contained in the SimTraffic software. SimTraffic operations were used instead of the typical Highway Capacity Manual (HCM) methodologies within Synchro software because the HCM methodologies can only evaluate operations within a single intersection while SimTraffic considers the impacts of upstream and/or downstream conditions of the intersection.

Operating conditions experienced by drivers are described in terms of Level of Service (LOS), which is a qualitative measure of factors such as delay, speed, travel time, freedom to maneuver, and driving comfort and convenience. Levels of service are represented by a letter scale from LOS A to LOS F, with LOS A representing the best performance and LOS F representing the poorest performance.

The LOS for a side-street stop-control (SSSC) intersection is a function of average control delay for each minor street approach movement. Conversely, the LOS for an all-way stop-control (AWSC) and signalized intersection are a function of average control delay for the intersection as a whole. For SSSC intersections, LOS service is reported for the worst approach movement. **Table 1** relates the operational characteristics associated with each LOS category for signalized and unsignalized intersections.

Table 1: Intersection Level of Service Definitions

LEVEL OF SERVICE	DESCRIPTION	SIGNALIZED (Avg. control delay per vehicle sec/veh)	UNSIGNALIZED (Avg. control delay per vehicle sec/veh)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	≤ 10	≤ 10
B	Stable traffic. Traffic flows smoothly with few delays.	> 10 – 20	> 10 – 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	> 20 – 35	> 15 – 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	> 35 – 55	> 25 – 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	> 55 – 80	> 35 – 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 80	> 50

Source: Highway Capacity Manual, 6th Edition.

The LOS criteria, as outlined in the Napa County General Plan, states that the traffic LOS should not exceed LOS D at signalized intersections and on arterial roadways with the exception of the following roadway segments:

- SR-29 in unincorporated areas between Yountville and Calistoga – LOS F is acceptable
- Silverado Trail between SR-128 and Yountville Cross Road – LOS E is acceptable

2 EXISTING FIELD CONDITIONS

This section describes the existing conditions of the roadway network, transit service, pedestrian facilities, and bicycles facilities within the vicinity of the study area. This section also presents the existing turning movement volumes, intersection level of service, and gap study analysis.

2.1 Existing Roadway Analysis

The following provides a description of the specific roadways included in this study.

Conn Creek Road/SR-128 is a two-lane, north-south highway near the study area which serves commercial and agricultural land uses. It connects to Skellenger Lane to the south and to Silverado Trail to the north. Conn Creek Road becomes SR-128 at Rutherford Road/SR-128. There is no posted speed limit on Conn Creek Road.

Oakville Cross Road is a two-lane, east-west collector roadway near the study area which serves commercial and agricultural land uses. It connects to SR-29 to the west and to Silverado Trail to the east. There is no posted speed limit on Oakville Cross Road.

Oakville Grocery Driveway is private road providing access to the Oakville Grocery.

Robert Mondavi Winery Driveway is a private road providing access to the Robert Mondavi Winery parking lot.

Rutherford Road/ SR-128 is a two-lane, east-west highway near the study area which serves commercial and residential land uses. It connects to SR-29 to the west and becomes Conn Creek Road/SR-128 to the east. The posted speed limit on Rutherford Road near the study area is 30 miles per hour.

Sage Canyon Road/SR-128 is two-lane, east-west highway near the study area. It connects to Silverado Trail to the west and becomes Capell Valley Road to the east at Berryessa Knoxville Road. The posted speed limit on Sage Canyon Road near the study area is 40 miles per hour.

Silverado Trail is a two-lane, north-south arterial roadway near the study area which serves commercial and agricultural land uses. It connects to Soscol Avenue to the south and to SR-29 in Calistoga in the north, providing access to multiple municipalities along its route including the City of Napa, Town of Yountville, Oakville, Rutherford and City of St. Helena near the study area. The posted speed limit near the study area is 55 miles per hour.

Skellenger Lane is a two-lane, east-west collector roadway near the study area which serves agricultural land uses. It connects to Conn Creek Road to the west and to Silverado Trail to the east. There is no posted speed limit on Skellenger Lane.

SR-29 is a two-lane, north-south conventional highway with discontinuous two-way left-turn lanes (TWLTL) within the study area. SR-29 serves commercial and agricultural land uses and includes many driveways within the limits of the study area. It connects to SR-20 in Lake County and to I-80 in Solano County. SR-29 contains a section north of Rutherford Road that is contiguous with SR-128 and a section to the south of SR-121 that is contiguous with SR-121 and SR-12. The posted speed limit near the study area on SR-29 ranges from 40 miles per hour to 50 miles per hour.

2.1.1 Existing Bicycle and Pedestrian Facilities

Class II bicycle lanes and Class III bicycles routes exist within the project vicinity and are described as follows:

- Class II Bicycle Lanes
  - SR-29 between Rutherford Road and Madison Street

  - Conn Creek Road between Rutherford Road/SR-128 and Skellenger Lane
  - Silverado Trial between north of Zinfandel Lane and south of Oakville Cross Road
- Class III Bicycle Routes
  - Skellenger Lane between Conn Creek Road and Silverado Trail
  - Oakville Cross Road between SR-29 and Silverado Trail

While some painted bike lane markings exist on the Class II bicycle lane on Silverado Trail, the bulk of the lane runs along a wide shoulder on Silverado Trail. This existing bikeway network in the study area is depicted in **Figure 2.**

2.1.2 Existing Transit Service

Transit service in the study area is limited to two bus routes operated by the Napa Valley Transportation Authority under the Vine Transit brand. Lines 10 and 10X run from Napa to Calistoga, with Line 10 providing local service between Napa Valley College and Calistoga, and Line 10X providing express service between Soscol Gateway Transit Center and Calistoga. Transit service is shown in **Figure 3.**

2.1.3 Existing Lane Configuration and Traffic Control

Existing intersection lane configurations and traffic control at study intersections are illustrated in **Figure 4**. All study intersections are side-street stop-controlled. The figure also shows the length of the right and left turn storage bays where present.

2.1.4 Existing Traffic Volumes

The weekday PM peak period traffic counts were collected between 3:30 PM to 6:30 PM on Tuesday, May 21, 2019 through Thursday, May 23, 2019 at the study intersections. There was minimal variance in the volumes between each day, with Wednesday volumes primarily being the median volumes of the three days. In addition, the peak hour was observed to generally be between 3:30 PM and 4:30 PM. The Wednesday volumes between 3:30 PM and 4:30 PM are shown in **Figure 5**.

2.1.5 Existing Rail Activity

The Napa Wine Train is a tourist activity that runs along the railroad tracks adjacent to SR-29 and operates between Downtown Napa and St Helena. It begins at the Napa Wine Train station located in Downtown Napa and crosses Soscol Avenue and SR-29 in Napa, running along the west side of SR-29. It then crosses SR-29 at Whitehall Lane in St Helena, north of the study area, and runs along the east side of SR-29. The train operates up to approximately nine (9) times a day during peak days.

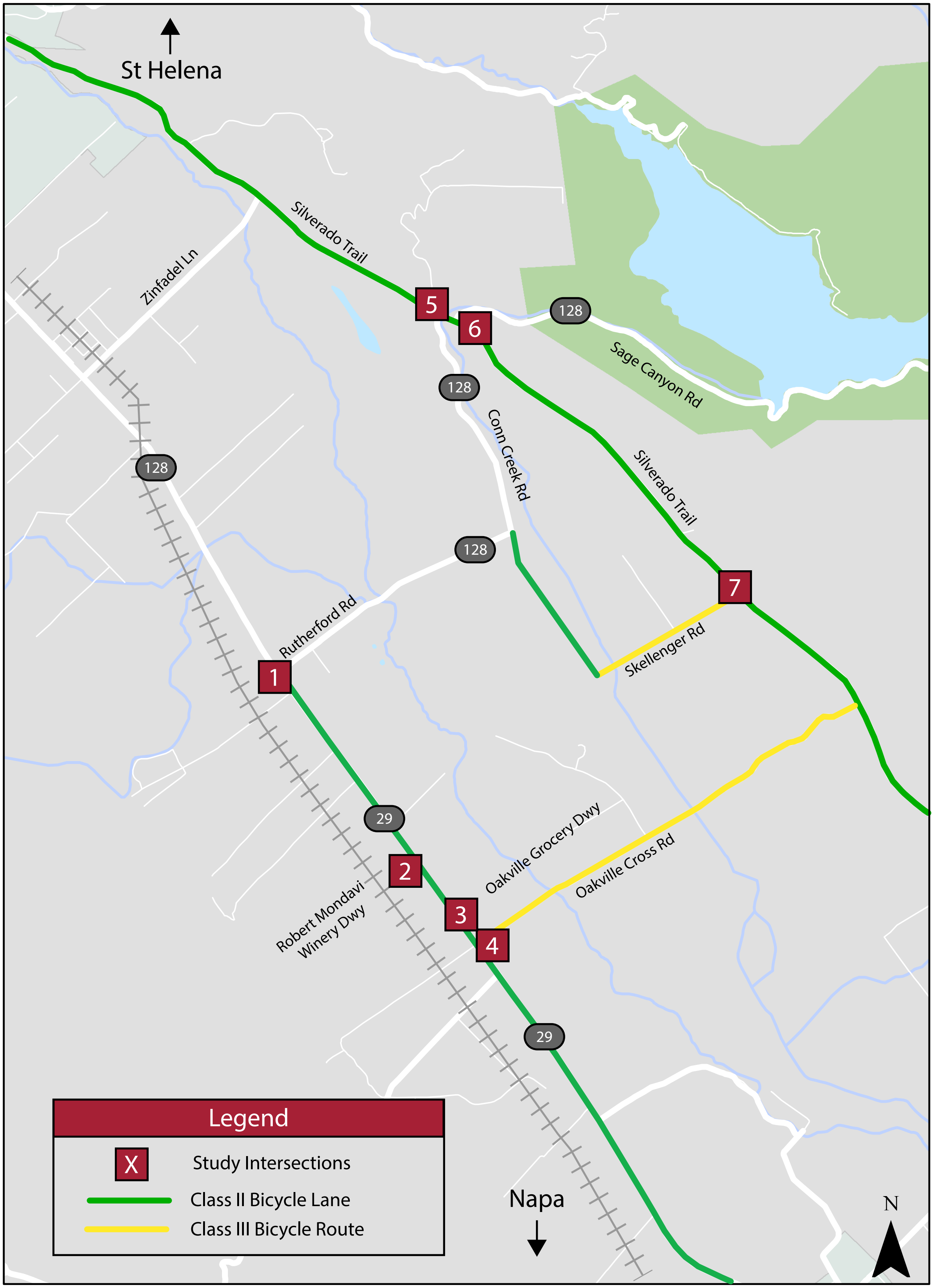
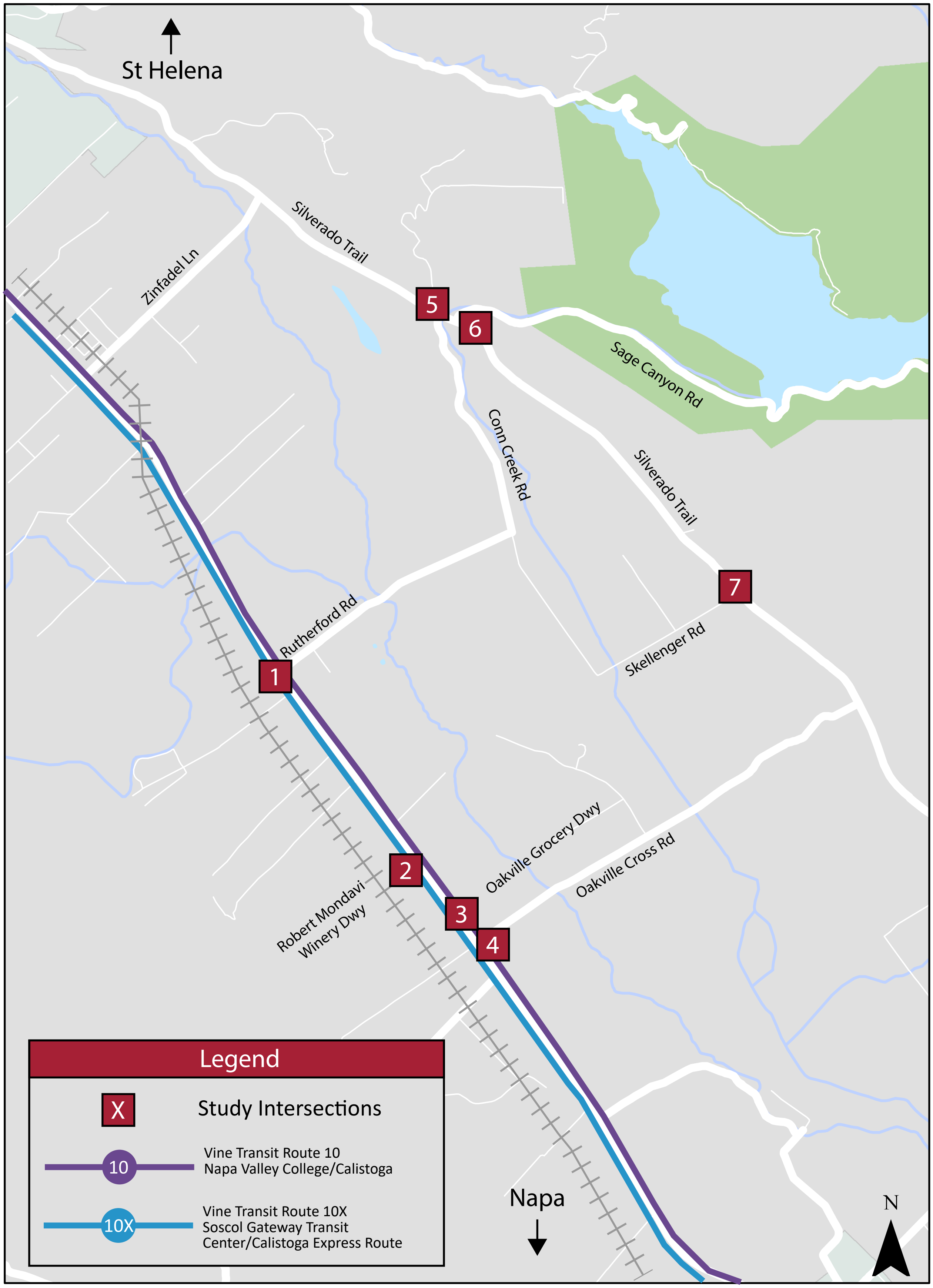
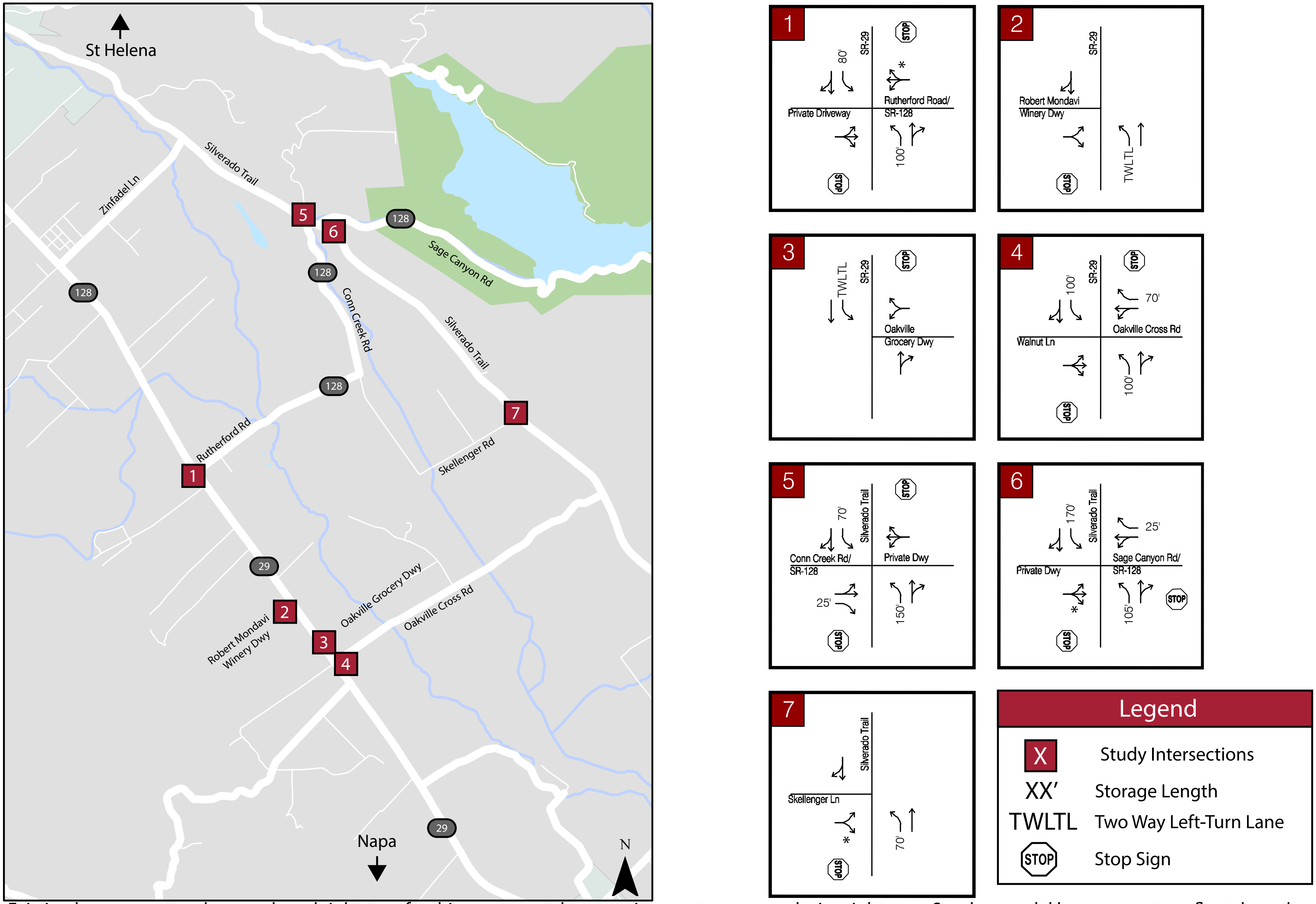


FIGURE 2
EXISTING BICYCLE FACILITIES


St Helena
Silverado Trail
Zinfadel Ln
5
6
Sage Canyon Rd
Conn Creek Rd
Silverado Trail
7
Rutherford Rd
1
Skellenger Rd
Oakville Grocery Dwy
Oakville Cross Rd
2
3
4
Robert Mondavi Winery Dwy
Napa
N
Legend
X
Study Intersections
10
Vine Transit Route 10
Napa Valley College/Calistoga
10X
Vine Transit Route 10X
Soscol Gateway Transit
Center/Calistoga Express Route



*Note: Existing lane geometry shows a shared right-turn for this movement, however it operates as an exclusive right-turn. Synchro model lane geometry reflects how the intersection operates.

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FIGURE 4

EXISTING LANE GEOMETRY AND TRAFFIC CONTROL

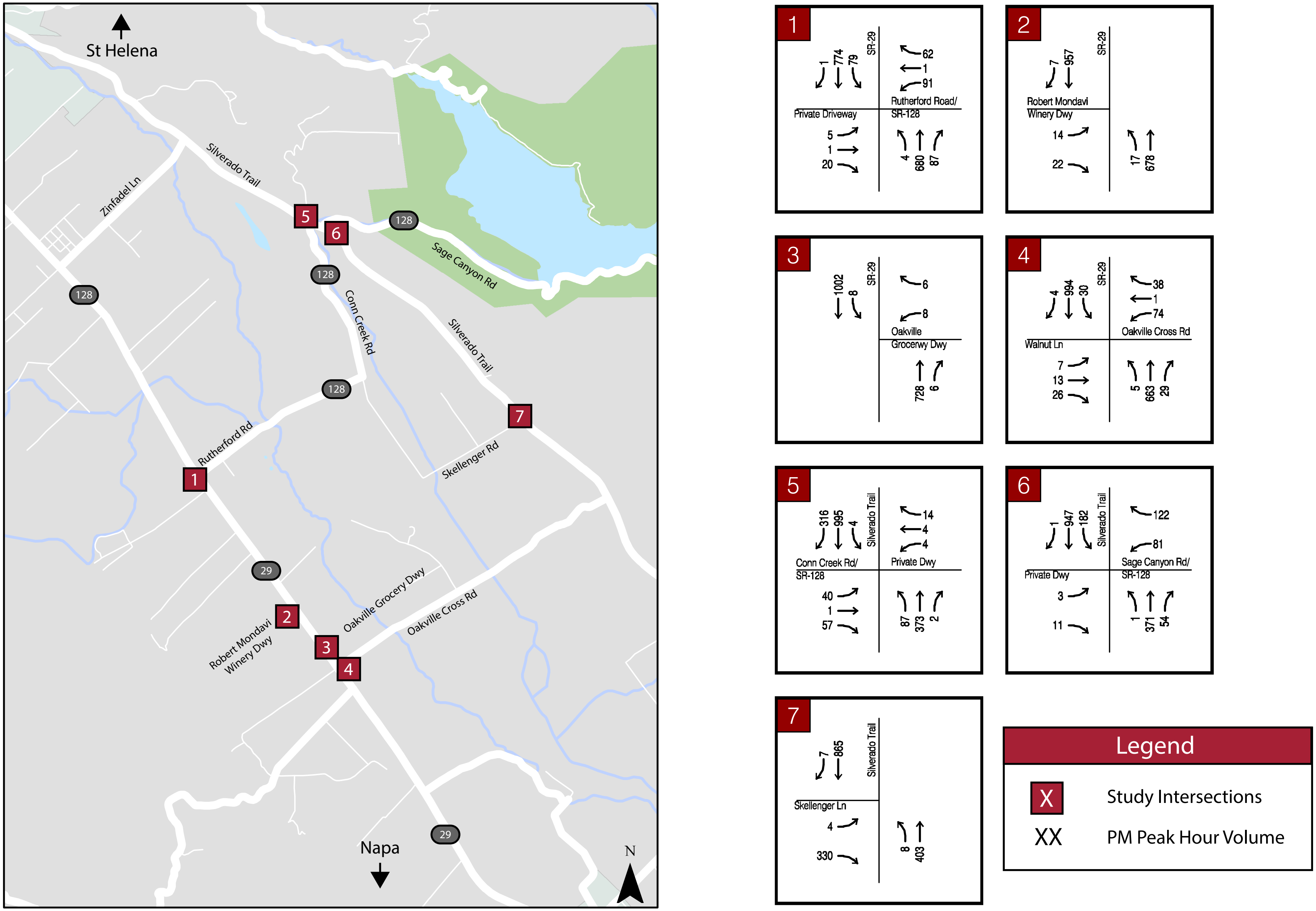


FIGURE 5

EXISTING PM PEAK HOUR TURNING MOVEMENT VOLUMES

2.1.6 Field Observations

Kimley-Horn visited the study area on Wednesday, May 22nd, 2019 to better understand the field conditions as well as investigate possible causes of the congestion in the area. The observations that were noted in the field were primarily related to available gaps for side street traffic, queues and other general travel patterns.

Based on field observations, the most severe congestion along southbound SR-29 appeared to be caused by the driveways along the corridor both at and upstream of the Robert Mondavi Winery Driveway. Vehicles slow down within that segment when cross street and driveway vehicles are entering and exiting SR-29. Fewer vehicles enter and exit SR-29 downstream of the Robert Mondavi Winery Driveway, therefore speeds begin to increase after that location.

As a result of the congestion along southbound SR-29, there are few available gaps for vehicles entering the highway. However, when vehicles on SR-29 come to a standstill (or speeds less than 10 mph), some vehicles on southbound SR-29 yield the right-of-way to entering vehicles and it may be less difficult for vehicles to enter when SR-29 is congested. When southbound vehicles yield right-of-way to cross-street traffic, delay and congestion further increase on SR-29.

There is also a two-way left-turn lane (TWLTL) or a dedicated left-turn lane at each of the three intersections on SR-29 where gap data was collected. Along SR-29 near both Rutherford Road and Oakville Cross Road, the TWLTL transitions into a northbound left turn pocket on either side of the intersection. During periods of congestion, some vehicles making a westbound left turn from Rutherford Road and Oakville Cross Road experience difficulty entering southbound SR-29 when they were not let in, and these vehicles queue in the northbound left turn storage lane until a gap is available for them to enter the southbound highway. There were a few vehicles in the northbound left turn at each intersection.

On SR-29 at SR-128/Rutherford Road, congestion on southbound SR-29 began around 3:40 PM. Most vehicles making a westbound right-turn from Rutherford Road onto northbound SR-29 did not have any significant delays and those making a westbound left-turn onto Southbound SR-29 were able to complete that turn when vehicles on southbound SR-29 allowed them to enter.

On SR-29 at Robert Mondavi Winery Driveway, congestion on southbound SR-29 began around 3:30 PM. The queue in the area did recede from the intersection at times but travel speeds on southbound SR-29 remained low (i.e. between 0-25 mph). The lower speeds on southbound SR-29 did benefit the side-street vehicles when drivers on southbound SR-29 would allow vehicles making an eastbound right-turn from the winery to merge in front them and would provide an available gap for vehicles making an eastbound left-turn to cross southbound SR-29 and enter northbound SR-29. Approximately 90 percent of side-street vehicles would wait about one or two cars at most before being allowed in. During gap study observations, approximately 25 percent of the side-street vehicles increased their speed to make an eastbound right-turn or eastbound left-turn and approximately 20 percent of side-street vehicles caused southbound SR-29 vehicles to brake, adding to southbound SR-29 congestion and delay.

On SR-29 at Oakville Cross Road, the speeds in the southbound direction were at or near free flow conditions. This made westbound left-turn movements challenging but, as mentioned above, left-turning vehicles from Oakville Cross Road treated the northbound left-turn lane at the intersection as if it were a TWLTL and aggressively joined the southbound traffic flow with cars southbound on SR-29 having to slow down approximately 75 percent of the time. Vehicles completing a two-stage westbound left-turn treated the 100-foot northbound left-turn lane as a TWLTL since there are few northbound left turning vehicles. After Oakville Cross Road vehicles made the first stage of the left turn into the northbound left-turn lane, southbound SR-29 vehicles would usually slow down and allow the vehicles in the northbound left-turn lane to merge in. Right-turning cars from Oakville Cross Road would merge onto northbound SR-29 without any slow-down.

On southbound Silverado Trail, congestion appeared to be caused by the high eastbound right-turn volumes at the Skellenger Lane intersection with Silverado Trail. Congestion on southbound Silverado Trail extends to just south of Conn Creek Road and does not recover to free flow conditions until downstream of Skellenger Lane. Observations showed a one-to-one merge between the southbound through vehicles and the eastbound right turn vehicles at this intersection, even though the stop-control is only for the eastbound approach. The high eastbound right-turn volume at Skellenger Lane is due to vehicles bypassing the southbound congestion on Silverado Trail by using Conn Creek Road to connect to Skellenger Lane. Multiple GPS maps and apps showed this as the quickest route when traveling southbound on Silverado Trail. Southbound vehicles on SR-29 also make a left turn at Rutherford Road and use Conn Creek Road to connect to Skellenger Lane to bypass the southbound congestion on SR-29. However, Skellenger Lane traffic is comprised of far fewer vehicles detouring from SR-29 than vehicles detouring from Silverado Trail.

On Silverado Trail at SR-128/Conn Creek Road, southbound congestion did not extend as far north as the intersection, so vehicles on Silverado Trail were moving at free flow speeds. The high speeds (i.e. 55 mph) on Silverado Trail made it difficult for vehicles to make eastbound left and right-turns from Conn Creek Road. Since there is no TWLTL along Silverado Trail at Conn Creek Road, vehicles making an eastbound left turn need to wait until there is an available gap in both directions before entering the intersection in a one-stage movement. In addition, there were typically several vehicles making a northbound left turn onto Conn Creek Road from Silverado Trail, which further increased delays for the side-street vehicles turning from Conn Creek Road because they had to yield to another conflicting movement. At other times, there were enough available gaps for vehicles on Conn Creek Road to make a left turn onto Silverado Trail. During gap study observations, approximately four percent of the vehicles on Conn Creek Road aggressively increased their speed to make an eastbound right-turn or eastbound left-turn and approximately two percent of the side-street vehicles caused vehicles on Silverado Trail to brake.

2.2 Gap Study

Kimley-Horn conducted a gap study along SR-29 and Silverado Trail to determine the accepted and rejected gaps by side-street/driveway vehicles along each corridor. The gap study was conducted at the following four side-street stop-controlled intersections along SR-29 and Silverado Trail:

- Intersection #1 – SR-29 and Rutherford Road
- Intersection #2 – SR-29 and Robert Mondavi Winery Driveway
- Intersection #4 – SR-29 and Oakville Cross Road
- Intersection #5 – Silverado Trail and Conn Creek Road

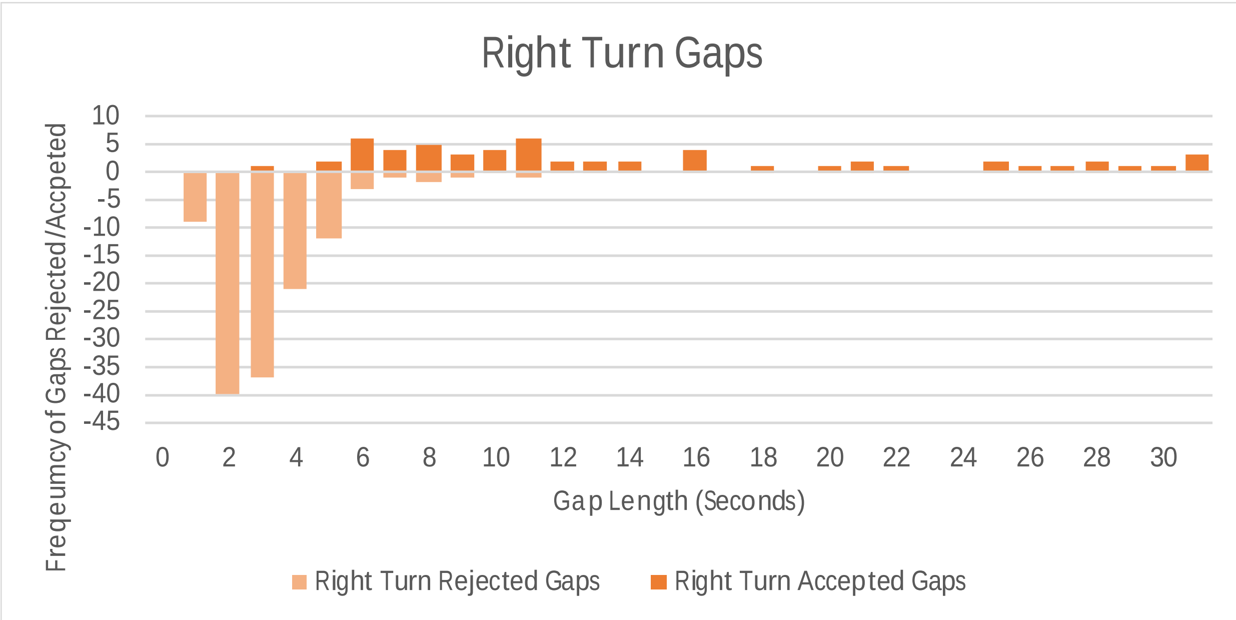
The data for the gap study involved noting the gaps that exist in the traffic stream as well as determining the average delay of the side-street vehicle. The analysis was performed on Wednesday, May 22, 2019 during the PM peak period from 3:30 PM to 6:00 PM.

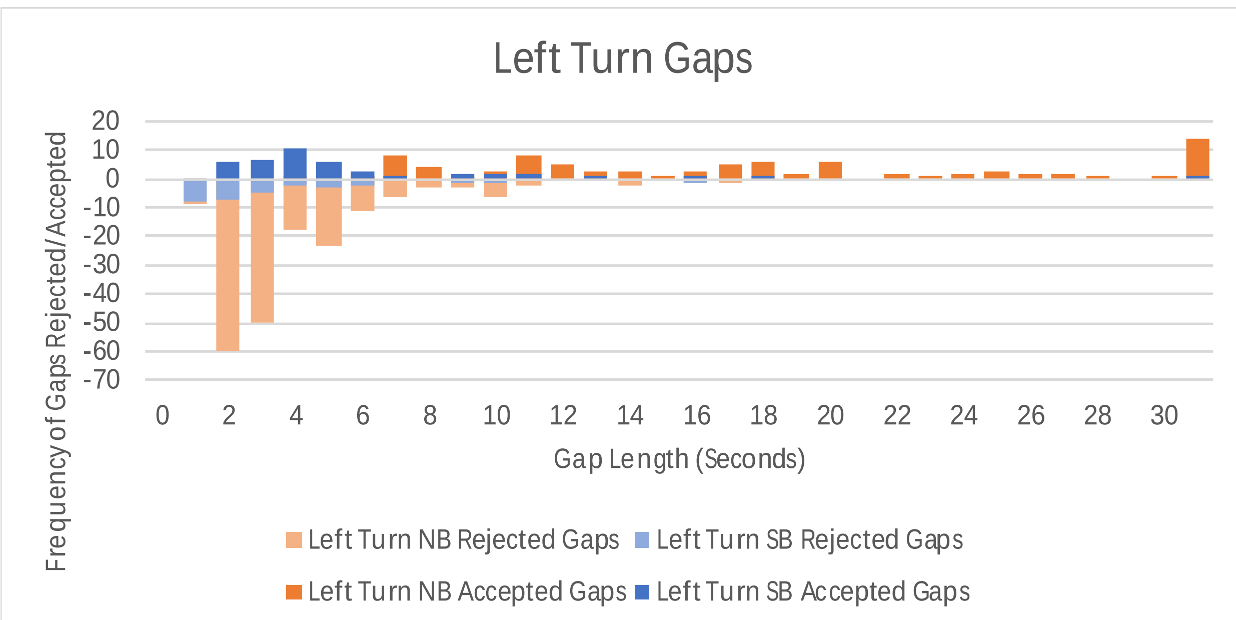
2.2.1 Gap Study Analysis

The analysis was conducted in various stages. The first step was to note the timestamps for vehicles on SR-29 and Silverado Trail in both directions to determine all available gaps. Simultaneously, the timestamp for vehicles approaching on the side street was also collected, as well as the time it took to complete either a right turn or left turn. Right-turn maneuvers from the side-street require the approaching vehicle to find a gap only in one direction of travel on SR-29 or Silverado Trail; however, left-turn maneuvers require the approaching vehicle to find a gap in two directions of travel on SR-29 or Silverado Trail. Several of the study intersections have either left-turn pockets or TWLTLs on SR-29, allowing vehicles to make a two-stage turning maneuver (turning into the left-turn lane or TWLTL once they get a gap in one direction on SR-29, followed by merging into the other direction of traffic on SR-29 once a gap is available). Where a vehicle was making a right-turn, or a one-stage turn, one timestamp was collected to determine when the vehicle entered the flow of traffic on SR-29 or Silverado Trail. Whereas if a vehicle was making a left-turn, or a two-stage turn, two timestamps were collected to determine when the vehicle crossed one direction of SR-29 or Silverado Trail and then entered the flow of traffic in the other direction.

The next step after data collection was to process the timestamps. This was done to determine which gaps were accepted or rejected by each vehicle. The average delay experienced by the side-street vehicle (as the lead vehicle only) at each of the four intersections was also collected. This analysis was completed for all four intersections where gap analysis data was collected. The gaps accepted and rejected by side-street street vehicle movements are graphically shown in **Figure 6** through **Figure 9**.

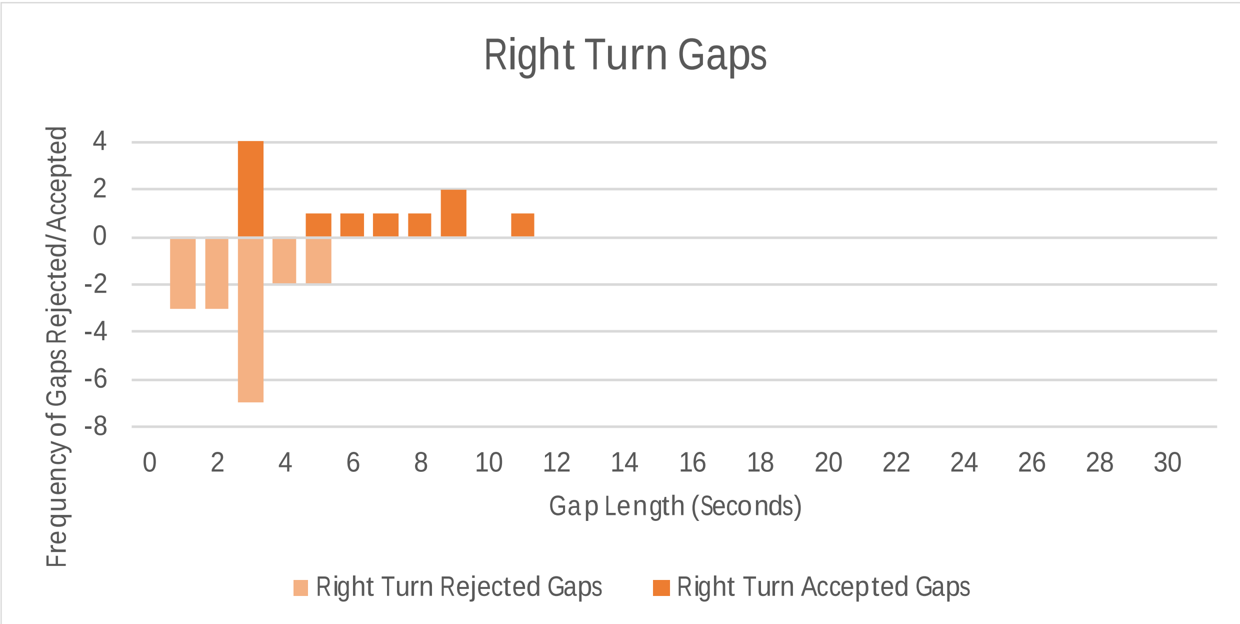
Figure 6: SR-29/Rutherford Road – Accepted and Rejected Gaps

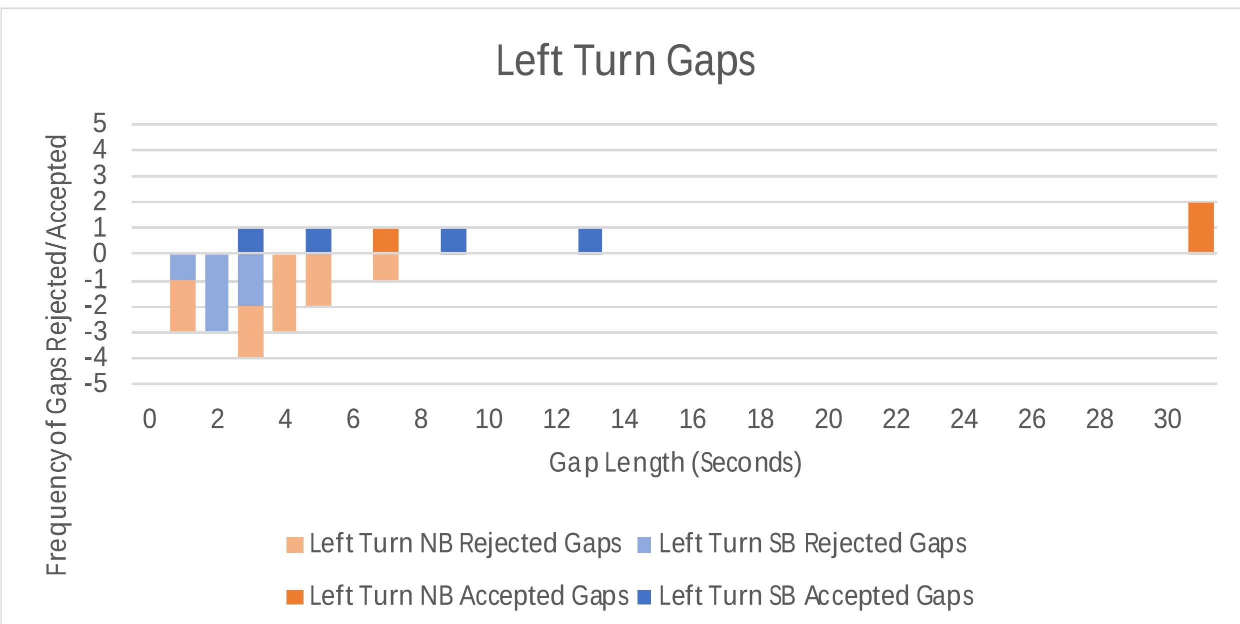




Note: Gaps Rejected shown as a negative number, gaps accepted shown as a positive number

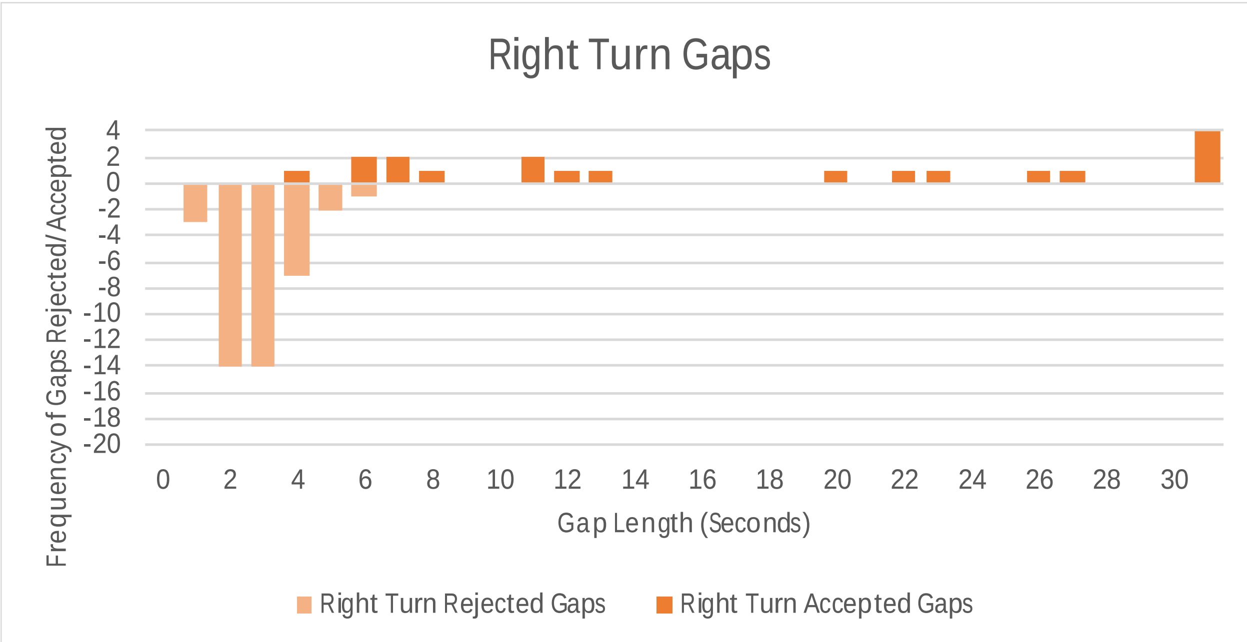
Figure 7: SR-29/Robert Mondavi Winery Driveway – Accepted and Rejected Gaps

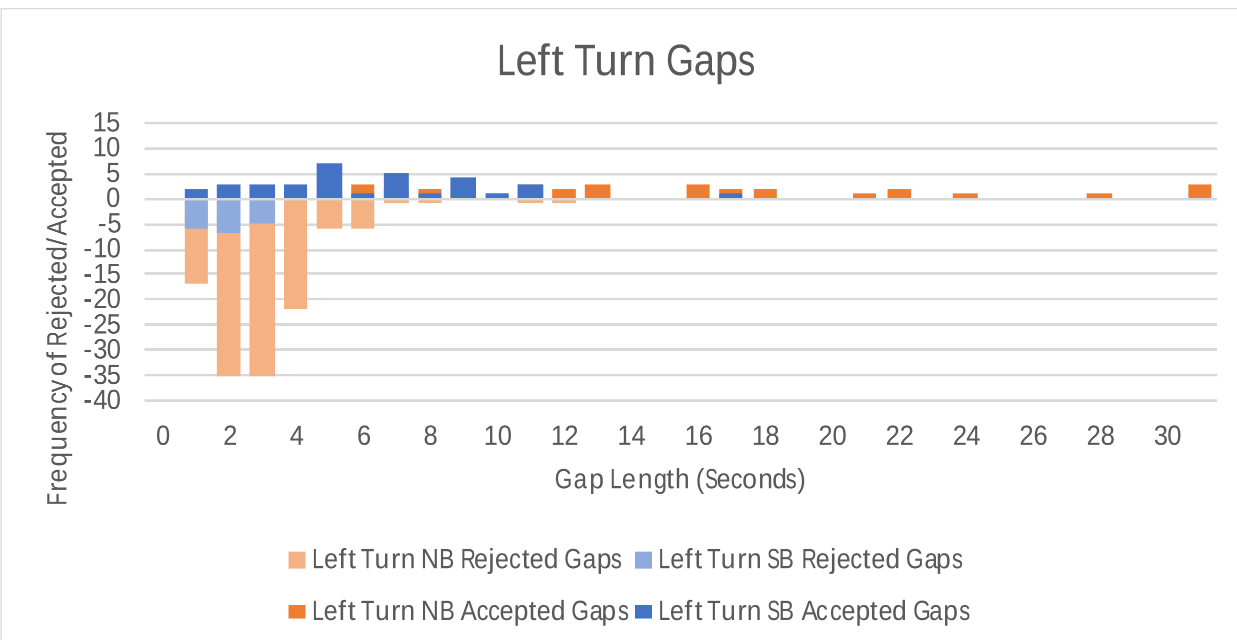




Note: Gaps Rejected shown as a negative number, gaps accepted shown as a positive number

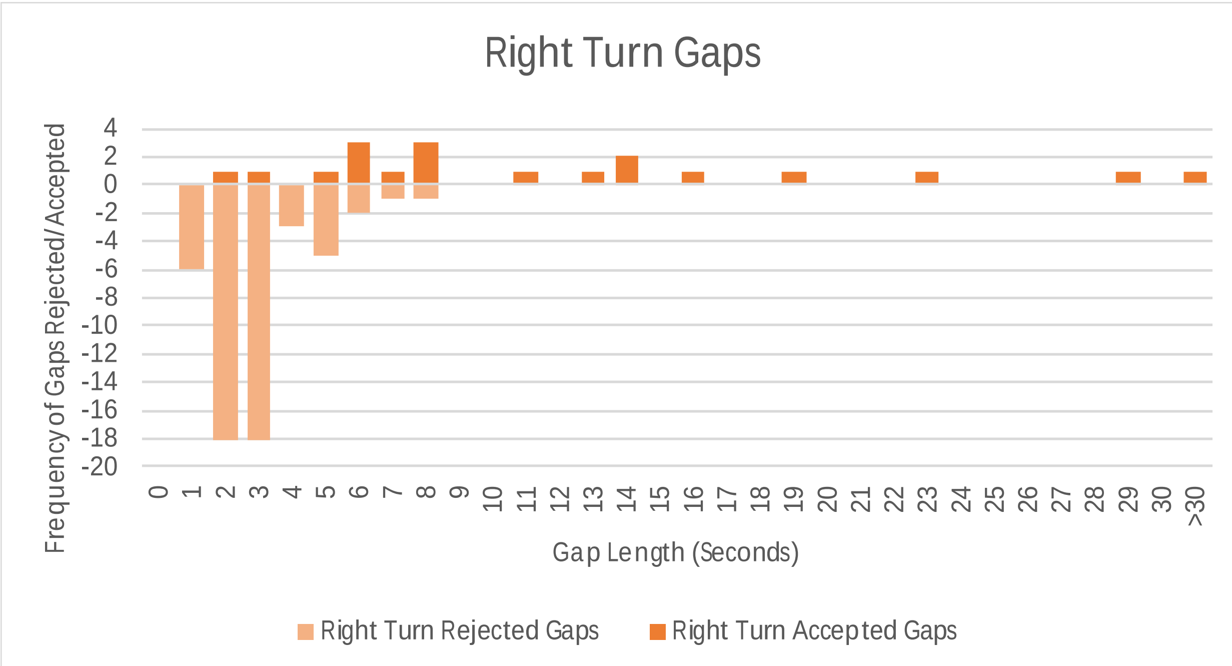
Figure 8: SR-29/Oakville Cross Road – Accepted and Rejected Gaps

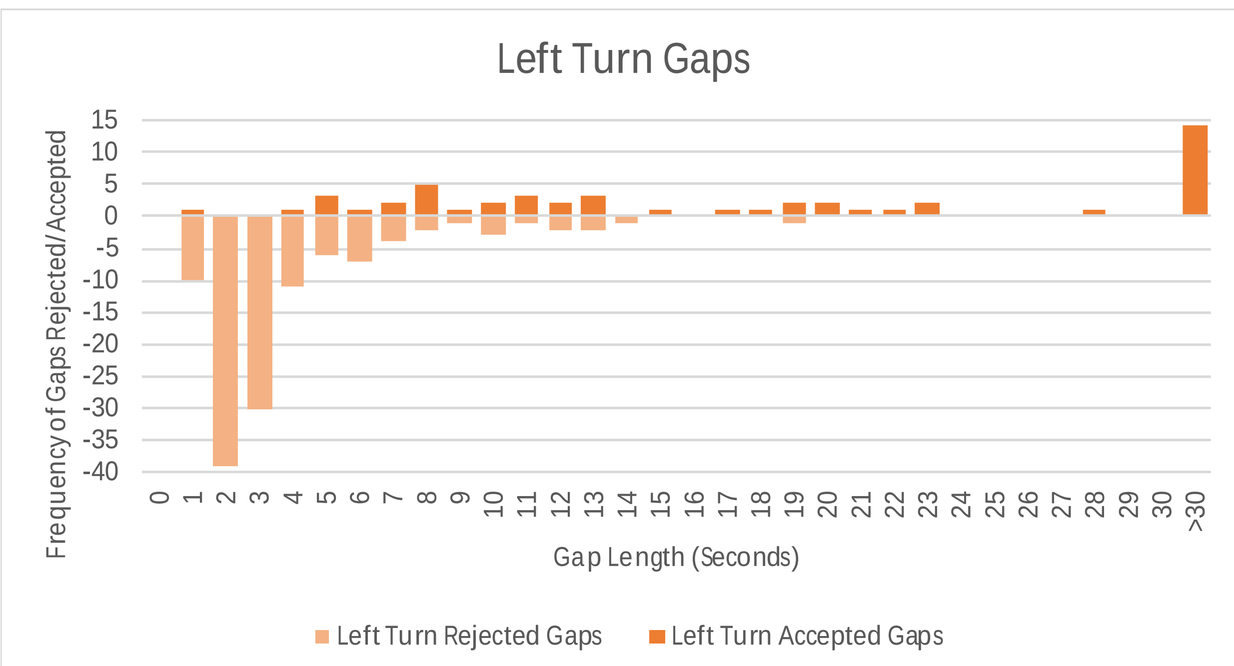




Note: Gaps Rejected shown as a negative number, gaps accepted shown as a positive number

Figure 9: Silverado Trail/Conn Creek Road – Accepted and Rejected Gaps





Note: Gaps Rejected shown as a negative number, gaps accepted shown as a positive number

Table 2: Average Accepted and Rejected Gaps on SR-29 and Silverado Trail

#	Intersection	Movement	SR-29 and Silverado Trail Gap Direction	Accepted Gaps (seconds)		HCM Critical Gap	5th Percentile Accepted Gap < HCM Critical Gap?	Rejected Gaps (seconds)		Average Side-Street Vehicle Delay[1] (Seconds)
				Average	5th Percentile			Average	95th Percentile	
1	SR-29 / Rutherford Road	WB Left Turn	SB Gap	6.4	1.3	6.1	**Yes**	2.9	8.9	26.3
			NB Gap	20.7	6.5	6.1	No	3.5	9.4	
		WB Right Turn	NB Gap	14.0	5.0	6.2	**Yes**	2.7	5.1	8.0
2	SR-29 / Robert Mondavi Winery Driveway	EB Left Turn	NB Gap	23.6	2.7	6.1	**Yes**	2.7	5.0	24.8
			SB Gap	7.0	2.9	6.1	**Yes**	1.6	2.7	
		EB Right Turn	SB Gap	5.5	2.1	6.2	**Yes**	2.2	4.1	8.6
4	SR-29 / Oakville Cross Road	WB Left Turn	SB Gap	5.6	1.2	6.1	**Yes**	1.4	2.5	16.6
			NB Gap	14.8	5.7	6.1	**Yes**	2.6	5.4	
		WB Right Turn	NB Gap	17.3	5.5	6.2	**Yes**	2.3	4.0	5.9
5	Silverado Trail / Conn Creek Road	EB Left Turn	NB Gap	27.9	4.8	7.1	**Yes**	3.4	10.8	20.7
			SB Gap	16.6	4.8					
		EB Right Turn	SB Gap	11.6	2.1	6.2	**Yes**	2.4	5.3	9.8

[1] Delay only as lead vehicle

The average and 5th percentile accepted gaps, as well as the average and 95th percentile rejected gaps, were determined and summarized in **Table 2**. The 5th percentile gaps are listed to show the minimum gaps that side-street vehicles are willing to accept. The average gaps accepted can be misleading because many of the northbound gaps are long to begin with since there are less vehicles traveling northbound on SR-29 and Silverado Trail in the PM peak hour. Critical headway gaps based on the Highway Capacity Manual 6th Edition (HCM), are shown in **Table 2** and compared with the 5th percentile accepted gaps. Critical gaps are the minimum acceptable time intervals necessary to allow vehicles to cross or enter the opposing flow of traffic.

As shown in **Table 2**, all movements have a 5th percentile accepted gap less than the HCM critical gap with the exception of the westbound left-turn at SR-29 and Rutherford Road when crossing northbound SR-29. Findings that the 5th percentile gap accepted is less than the HCM gap at nearly all intersections indicate that side-street vehicles are turning aggressively and making maneuvers into gaps that are insufficient. As a result, vehicles along SR-29 and Silverado Trail are forced to slow down, thereby creating periods of congestion upstream due to saturated conditions and results in additional delay for traffic already operating under saturated conditions. It is likely that this effect is the root cause of the congestion on SR-29 and Silverado Trail.

2.3 Travel Times Analysis

2.3.1 INRIX Travel Times

INRIX data was obtained to determine travel time and average speed data along each corridor. The INRIX data was used as a comparison to SimTraffic outputs to calibrate the existing conditions models.

2.3.1.1 <u>Methodology</u>

The INRIX data captures the travel time between set data points along a roadway by gathering information anonymously from vehicles and GPS-enabled smart phones that pass the set points. The INRIX data was collected and downloaded for multiple days during periods when traffic counts were collected. The INRIX data provided travel times along SR-29 between north of Rutherford Road and approximately 0.55 miles south of Oakville Cross Road (approximately 2.6 miles) and along Silverado Trail between Conn Creek Road and approximately 0.36 miles south of Skellenger Lane (approximately 2.7 miles). Speeds along SR-29 and Silverado Trail were also obtained for the same limits collected for travel times. **Table 3** and **Table 4** show the average speeds for Wednesday, May 22, 2019 along SR-29 and Silverado Trail, respectively. INRIX segment limits along SR-29 and Silverado Trail are shown in **Figure 10**. **Figure 11**, **Figure 12**, and **Table 5** summarize the INRIX travel times and average speeds along each corridor for Wednesday, May 22, 2019.

Table 3: SB SR-29 Speed Contour – PM Peak Period

Segment #	Segment Limits	Speed Limit (mph)	Speed (mph) 3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM	6:30 PM
1	North of Rutherford Rd to approx 450 ft north of Manley Ln	40 / 50	37	31	14	12	13	19	15	16	17	24	31	28	14
2	Approx 450 ft north of Manley Ln to 250 ft south of Glos Ln	50	37	30	19	14	17	20	18	17	30	31	18	22	17
3	250 ft south of Glos Ln to 550 ft north of Oakville Cross Rd	50	38	33	24	21	26	27	27	24	37	30	24	37	45
4	550 ft north of Oakville Cross Rd to 2,900 ft south of Oakville Cross	50	41	37	37	34	43	35	41	41	38	23	38	45	46
Average Speed (mph)			38	33	23	20	25	25	25	24	31	27	28	33	30

Speed (mph)
- ≥40 - 50
- ≥30 - 40
- ≥20 - 30
- ≥10 - 20

Table 4: SB Silverado Trail Speed Contour – PM Peak Period

Segment #	Segment Limits	Speed Limit	Speed (mph) 3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM	6:30 PM
1	Conn Creek Rd to SR 128	55	50	42	49	38	19	50	34	39	42	49	50	50	50
2	SR 128 to 3400 ft south of SR 128	55	49	38	24	15	11	27	13	14	31	43	51	54	50
3	3400 ft south of SR 128 to 550 ft north of Ponti Rd	55	50	50	44	13	8	14	24	11	11	19	50	52	51
4	550 ft north of Ponti Rd to 1400 ft north of Skellenger	55	50	51	28	22	8	10	15	10	13	19	26	48	31
5	1400 ft north of Skellenger to 1900 ft south of Skellenger	55	49	49	17	16	13	13	14	14	13	20	19	48	19
Average Speed (mph)			50	46	32	21	12	23	20	18	22	30	39	51	40

Speed (mph)
- ≥50
- ≥40 - 50
- ≥30 - 40
- ≥20 - 30
- ≥10 - 20
- <10

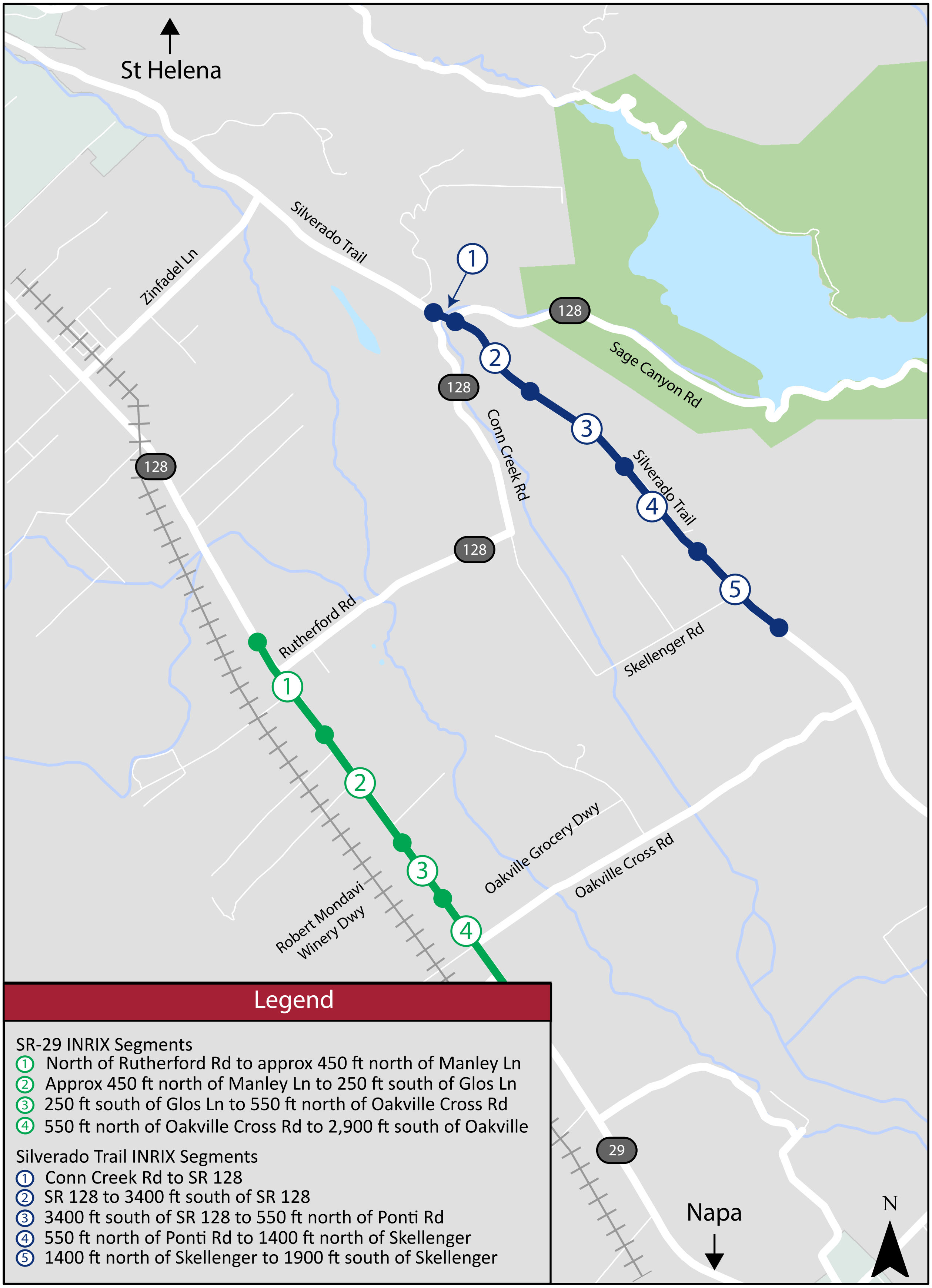


FIGURE 10
INRIX SEGMENTS

Figure 11: SB SR-29 PM INRIX Travel Time Graph

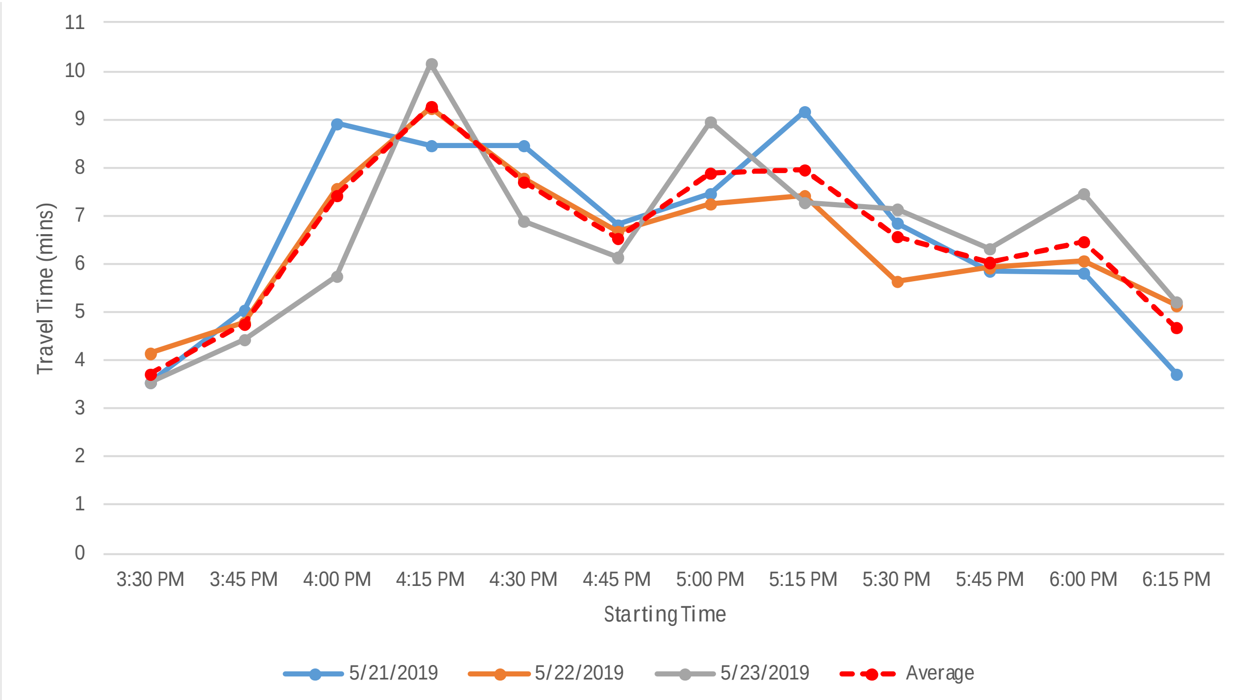


Figure 12: SB Silverado Trail PM INRIX Travel Time Graph

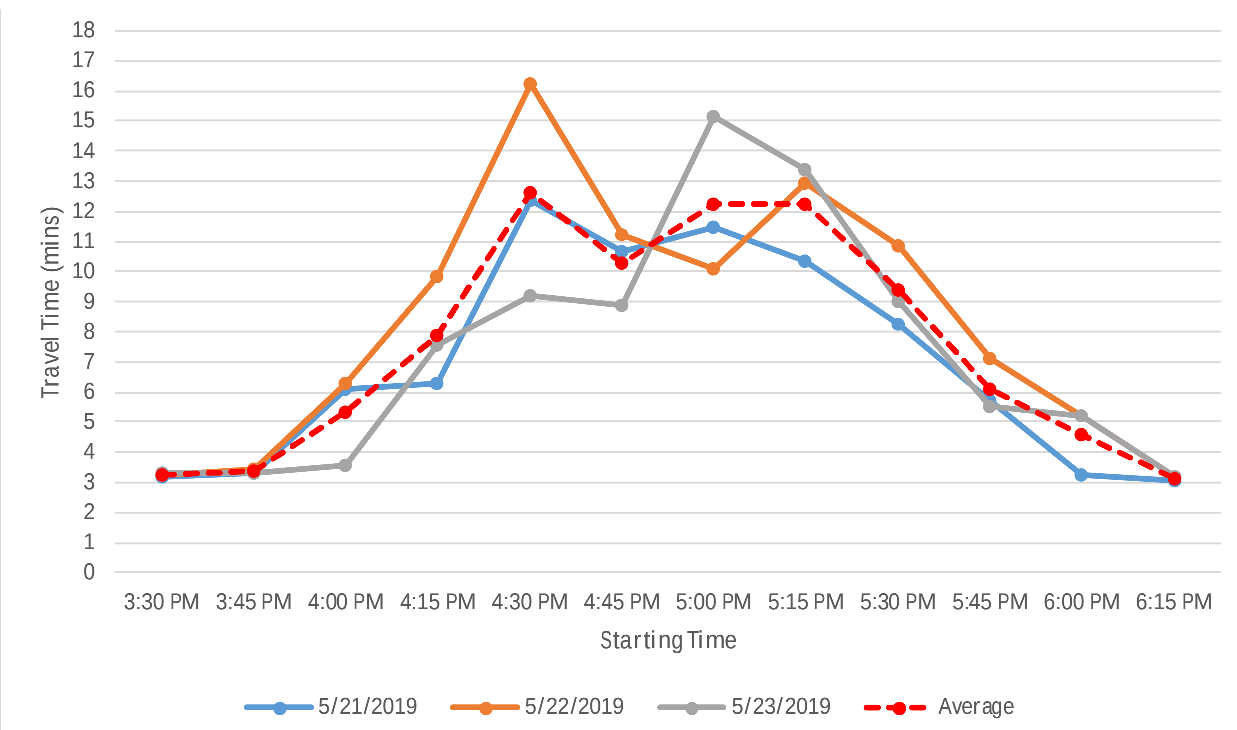


Table 5: INRIX Travel Time Summary

Start Time	SB SR-29		SB Silverado Trail	
	INRIX Travel Time (minutes)	INRIX Average Speeds (mph)	INRIX Travel Time (minutes)	INRIX Average Speeds (mph)
3:30 PM	4.13	38	3.23	50
3:45 PM	4.80	33	3.47	46
4:00 PM	7.58	23	6.26	32
4:15 PM	9.23	20	9.84	21
4:30 PM	7.76	25	16.21	12
4:45 PM	6.66	25	11.22	23
5:00 PM	7.24	25	10.07	20
5:15 PM	7.43	24	12.92	18
5:30 PM	5.65	31	10.86	22
5:45 PM	5.91	27	7.11	30
6:00 PM	6.08	28	5.24	39
6:15 PM	5.13	33	3.19	51

For southbound SR-29, the travel times vary between 4.13 minutes and 9.23 minutes for this segment. The maximum travel time of 9.23 minutes occurs at 4:15 PM. It should be noted that the free-flow travel time is approximately three minutes, assuming a free-flow speed of 50 mph and a distance of 2.44 miles.

For southbound Silverado Trail, the travel times vary between 3.19 minutes and 16.21 minutes for this segment. The maximum travel time of 16.21 minutes occurs at 4:30 PM. It should be noted that the free-flow travel time is approximately three minutes, assuming a free-flow speed of 55 mph and a distance of 2.68 miles.

3 EXISTING MODEL CONDITIONS ANALYSIS

3.1 Existing Intersection Level of Service Analysis

Traffic operations were evaluated under baseline traffic conditions for Weekday PM peak hour conditions using Synchro and SimTraffic analysis platforms.

3.1.1 Lane Geometry and Intersection Control Inputs

The Synchro model was developed based on the existing lane geometry and intersection control for each study intersection. It should be noted that for some approaches the lanes are striped as a shared through-right lane, however the approach operates as a separate through lane and separate right turn lane due to the available width of the roadway. For example, the westbound approach at the intersection of SR-29 and Rutherford Road is striped as a single lane approach for the left turn, through, and right turn movements. However, this approach is wide enough for right-turning vehicles to slip by and therefore the approach operates as a shared left-through lane and a separate right turn lane. This operation significantly reduces the delay for the right-turning vehicles.

Default values for the movement setting under the HCM 6th Edition tab and for the simulation setting were also adjusted based on the gap study field observations collected. **Table 6** summarizes the adjustments modified.

In addition, to simulate the congestion on each study corridor, a roadway segment with a lower link speed (10 mph) was added to the following locations:

- SR-29 between Robert Mondavi Winery driveway and Oakville Grocery Driveway (also adjusted saturated flow to be 1,055 vphpl)
- SR-29 south of Rutherford Road (also adjusted saturated flow to be 1,055 vphpl)
- Silverado Trail south of Skellenger Lane (also adjusted saturated flow to be 1,000 vphpl)

The Synchro and SimTraffic software programs have limited capabilities for analyzing the unique traffic conditions on the SR-29 and Silverado Trail corridors. With each study corridor having no stop control at any of the intersections along SR-29 or Silverado Trail, without model intervention, the Synchro and SimTraffic software would show no congestion along SR-29 and Silverado Trail. Therefore, to simulate the slowdowns on SR-29 and Silverado Trail, these “dummy” roadway segments were added to reflect slowdowns observed on the corridors caused by driver behavior, as discussed in Section 2.2. By artificially restricting the speeds to 10 mph, the model is forced to simulate congestion along SR-29 and Silverado Trail that mimics the field conditions. Simply reducing the saturated flow rates did not result in model congestion that matched field conditions.

Table 6: Adjustments to Movement and Simulation Settings in Synchro

#	Intersection	Approach	Movement	Adjustment
1	SR-29 and SR-128/Rutherford Road	WB	N/A	Vehicles in Median Storage (#) from 0 to 2
		WB	Right	Critical Headway = 5.1 (Default = 6.2) Headway Factor = 0.8 (Default = 1)
		WB	Left	Headway Factor = 0.9 (Default = 1) “Yes” to entering blocked intersection
		EB	Thru	“Yes” to entering blocked intersection
		EB	Left	
		EB	Right	
2	SR-29 and Robert Mondavi Winery Driveway	EB	N/A	Vehicles in Median Storage (#) from 0 to 2
		EB	Left	Critical Headway Stage 1 = 2.7 (Default = 5.4) “Yes” to entering blocked intersection
		EB	Left	Critical Headway Stage 2 = 5.0 (Default = 5.4 “Yes” to entering blocked intersection
		EB	Right	Critical Headway = 4.1 (Default = 6.2) “Yes” to entering blocked intersection
3	SR-29 and Oakville Grocery Driveway	WB	Left	“Yes” to entering blocked intersection
4	SR-29 and Oakville Cross Road	WB	N/A	Vehicles in Median Storage (#) from 0 to 2
		WB	Left	Critical Headway Stage 1 = 5.4 (Default = 6.1) “Yes” to entering blocked intersection
		WB	Left	Critical Headway Stage 2 = 2.5 (Default = 6.1) “Yes” to entering blocked intersection
		WB	Right	Critical Headway = 4.0 (Default = 6.2)
		EB	Thru	“Yes” to entering blocked intersection
		EB	Left	
		EB	Right	
5	Silverado Trail and SR-128/Conn Creek Road	EB	Left	Critical Headway = 5.0 (Default = 7.1)
6	Silverado Trail and SR-128/Sage Canyon Road	WB	Left	Critical Headway = 5.0 (Default = 7.1)
7	Silverado Trail and Skellenger Lane	EB	Right	Critical Headway = 4.0 (Default = 6.2) “Yes” to entering blocked intersection
		EB	Left	“Yes” to entering blocked intersection

3.1.2 Volume Inputs

The PM peak hour volumes used for this evaluation are from 3:30 PM to 4:30 PM on Wednesday, May 22, 2019. Since the study corridors are under heavy congestion, demand volumes were calculated and used for the analysis. The demand volumes were calculated by adding the queued vehicles to the counted throughput vehicles on each corridor. The queued vehicles were calculated by determining the delay along each corridor using the INRIX travel times and multiplying them by the throughput of the bottleneck.

For the southbound SR-29 corridor, the bottleneck is the segment of SR-29 between the Robert Mondavi driveway and Oakville Cross Road. The bottleneck for SR-29 was determined from the counts downstream of the congestion at the intersection of SR-29 and Oakville Cross Road. The southbound approach volume for the PM peak hour was 1,055 vph. The average delay as measured from INRIX data was 3.37 minutes. By multiplying the throughput volume by the measured delay, the queued demand was determined to be 59 vph. The 59 vph were added to the southbound approaches for each of the intersections along SR-29 upstream of the bottleneck in congestion.

For the southbound Silverado Trail corridor, the bottleneck is the segment downstream of the Silverado Trail/Skellenger Lane intersection. The bottleneck for Silverado Trail was determined from the counts at the intersection of Silverado Trail/Skellenger Lane. The southbound through volume and the eastbound right turn volumes for the PM peak hour were added and equal 1,161 vph. The average delay as measured from INRIX data was 2.92 minutes. By multiplying the throughput volume by the measured delay, the queued demand was determined to be 44 vph. The 44 vph were added to the southbound approaches for each of the intersections along Silverado Trail upstream of the bottleneck in congestion. These demand volumes and the observed peak hour factors (calculated for each intersection) were input in the Synchro model. **Figure 13** shows the existing demand volumes used in the analysis.

3.1.3 SimTraffic Calibration

The default inputs for SimTraffic were primarily used for the model. However, to better reflect observed field conditions, the following parameters were modified:

- Headway @ 0 mph (sec) = Used 3 instead of default value of 0.65 to 0.35
- Headway @ 20 mph (sec) = Used 3 instead of default value of 1.80 to 0.80
- Headway @ 50 mph (sec) = Used 3 instead of default value of 2.20 to 1.00
- Headway @ 80 mph (sec) = Used 3 instead of default value of 2.20 to 1.00
- Gap Acceptance Factor = Used 0.75 instead of default value of 1.15 to 0.85

In addition, the following intersection specific parameters were modified in the Simulation Settings:

- Intersection #1 (SR-29 and Rutherford Road):
    - Southbound through Headway Factor = Used 2.00 instead of default value of 1.00

- Westbound left turn Turning Speed = Used 30 instead of default value of 15

The following SimTraffic modeling parameters were used:

- Seeding duration = 15 minutes
- Recording duration = four x 15-minute intervals
- PHF adjust = Yes, first 15-minute interval with PHF Adjustment, the remaining three intervals with inverse PHF adjusted

3.1.4 LOS and Delay Results

The SimTraffic model was run 10 times to determine the baseline PM peak period measures of effectiveness (MOE). The results of the 10 runs were averaged. The MOE's for this study include:

- Average delay per vehicle
- 95th percentile queues
- Corridor travel times

Table 7 summarizes the average delay per vehicle and level of service (LOS) for each intersection. Included is the jurisdictional standard for acceptable LOS (as previously described in the Analysis Methodology section). Analysis worksheets are provided in the **Appendix**.

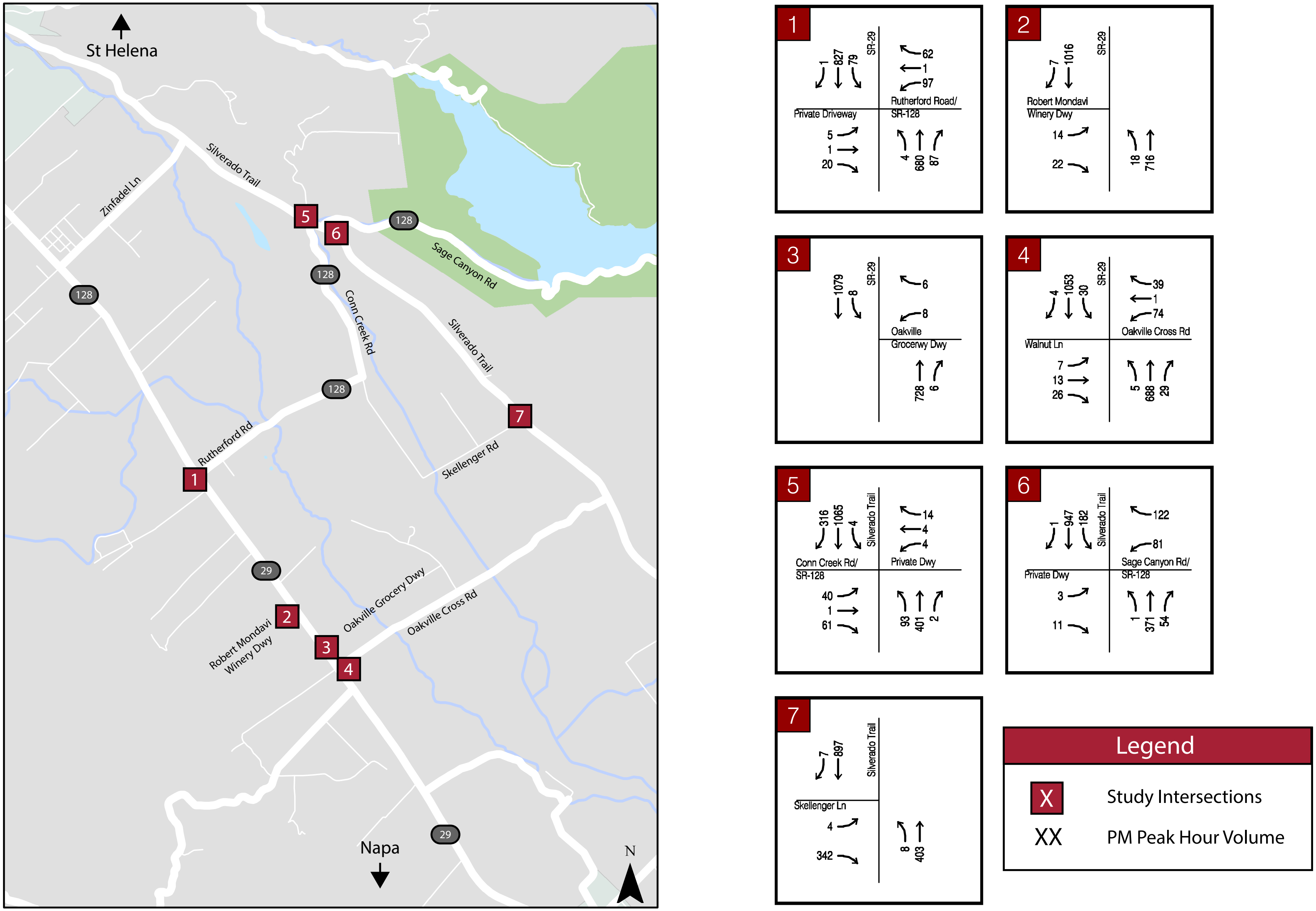


FIGURE 13
EXISTING PM PEAK HOUR TURNING MOVEMENT DEMAND VOLUMES

Table 7: Existing PM Peak Hour Intersection Delay and LOS Results

#	Intersection	Intersection Control	LOS Standard	PM Peak	
				LOS	Delay
1	SR-29 and SR-128/Rutherford Road	SSSC	F	F	163.1
	Westbound Left			F	878.7
	Westbound Right			F	867.0
	Eastbound Left			F	128.8
	Eastbound Right			E	36.2
2	SR-29 and Robert Mondavi Winery Driveway	SSSC	F	F	125.4
	Eastbound Left			C	23.3
	Eastbound Right			B	10.7
3	SR-29 and Oakville Grocery Driveway	SSSC	F	A	1.8
	Westbound Left			B	14.1
	Westbound Right			A	8.3
4	SR-29 and Oakville Cross Road	SSSC	F	A	7.4
	Westbound Left			E	42.9
	Westbound Right			B	10.3
	Eastbound Left			C	17.5
	Eastbound Right			A	5.2
5	Silverado Trail and SR-128/Conn Creek Road	SSSC	E	E	48.2
	Westbound Left			-	-
	Westbound Right			B	13.4
	Eastbound Left			**F**	**73.3**
	Eastbound Right			E	40.6
6	Silverado Trail and SR-128/Sage Canyon Road	SSSC	E	A	8.6
	Westbound Left			D	30.3
	Westbound Right			B	11.5
	Eastbound Left			A	5.7
	Eastbound Right			A	8.2
7	Silverado Trail and Skellenger Lane	SSSC	E	D	32.8
	Eastbound Left			C	15.4
	Eastbound Right			E	37.3

Notes:
- Delay and LOS calculated using SimTraffic software
- Delay reported in seconds/vehicle
- SSSC = Side-street stop-controlled
- LOS and delay shown **bold** reflect deficient operations
- SimTraffic did not report measurable delay for movements marked with "-"

Results of the analysis indicate that all study intersections operate at acceptable levels of service based on established significance criteria.

It should be noted that many of the other study intersections operate at LOS F, however, the Napa County General Plan allows for LOS F operations along SR-29 in unincorporated areas between Yountville and Calistoga.

In general, the queue results from the SimTraffic model overestimate the side-street queues at each intersection relative to field observations. Although the model was adjusted to increase the gap acceptance factor and the headways were increased for vehicles traveling at low speeds, vehicles on the side-street approaches still are not as aggressive as observed in the field and therefore the model queues are high. This is particularly true for the following movement:

- Westbound left turn at the intersection of SR-29 and Rutherford Road

SimTraffic lacks the capability to accurately model the traffic operations on this unique corridor where congestion occurs on the major roadway that is not the result of a stop-intersection control or reduction in roadway capacity. However, the SimTraffic model is expected to provide useful comparative results to aid in assessing the relative benefits and impacts of improvement strategies that may affect travel patterns, introduce new control points, and modify roadway capacity. Therefore, it is expected to be a useful tool in completing the subsequent effort of evaluating the feasibility and effectiveness of the potential improvement strategies.

3.1.5 Queuing Analysis

The SimTraffic model was also used to determine the existing queues at each study intersection. **Table 8** summarizes the 95th percentile queues for each intersection movement. Analysis worksheets are provided in the **Appendix**.

Table 8: Existing PM Peak Hour Intersection Queues

Int #1 – SR-29 & Rutherford Rd/SR-128		
Movement	Storage Length (ft)	95th Percentile Queue (ft)
EBL/T/R	-	59
WBL/T/R	-	1,680
NBL/T/R	-	27
SBL	80	**175**
SBT/R	-	1,415
Int #2 – SR-29 & Robert Mondavi Winery Dwy		
EBL/R	-	67
NBL	-	22
SBT/R	-	2,991
Int #3 – SR-29 & Oakville Grocery Dwy		
WBL/R	-	32
NBT/R	-	-
SBL	-	15
Int #4 – SR-29 & Oakville Cross Rd		
EBL/T/R	-	48
WBL/T	-	125
WBR	70	50
NBL	100	8
NBT/R	-	22
SBL	100	27
Int #5 – SR-29 & Conn Creek Rd/SR-128		
EBL/T/R	-	126
WBL/T/R	-	46
NBL	150	95
NBT/R	-	13
SBL	170	8
SBT/R	-	71
Int #6 – SR-29 & Sage Canyon Rd/SR-128		
EBL/T/R	-	38
WBL/T/R	-	137
NBL	150	7
NBT/R	-	6
SBL	170	45
SBT/R	-	-
Int #7 – SR-29 & Skellenger Ln		
EBL/R	-	304
NBL	70	21
SBT/R	-	71

Note: Locations where the queue length exceeds the link storage by 25 ft or more are shown in **bold.**
SimTraffic did not report measurable queue for movements marked with "-"

3.1.6 Arterial Travel Times

The SimTraffic model was also used to determine the arterial travel times along each study corridor. **Table 9** summarizes the arterial travel time outputs from the SimTraffic model. Analysis worksheets are provided in the **Appendix**.

Table 9: SimTraffic Arterial Operations Summary

Segment Corridor	Arterial Operations	
	Travel Time (minutes)	Speed (mph)
SB SR-29		
Rutherford Road to Robert Mondavi Winery Dwy	12.5	7
Robert Mondavi Winery Dwy to Oakville Grocery Dwy	5.1	4
Oakville Grocery Dwy to Oakville Cross Road	0.1	40
Entire Segment	**17.7**	**6**
SB Silverado Trail		
Conn Creek Road to Sage Canyon Road	0.2	29
Sage Canyon Road to Skellenger Lane	16.5	8
Entire Segment	**16.7**	**8**

The SimTraffic simulated arterial travel times for each corridor is 17.7 minutes and 16.1 minutes for SR-29 and Silverado Trail, respectively. The simulation travel time along SB SR-29 is approximately nine (9) minutes higher than the travel time provided by INRIX (9 minutes on SR-29) while the simulation travel time along SB Silverado Trail is approximately one (1) minute higher than the travel time provided by INRIX (16 minutes on Silverado Trail). As noted previously, there are insufficient tools within Synchro and SimTraffic to accurately simulate the causes of delay currently being experienced in these corridors, and thus the models have limited calibration opportunity.

Appendices

Appendix A: Turning Movement Counts

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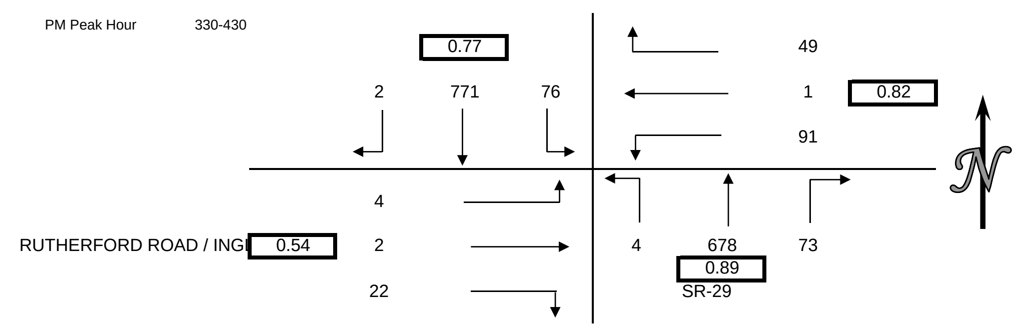
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		TUESDAY MAY 21, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	RUTHERFORD ROAD / INGLENOOK WINERY DRIVEWAY
CITY:		NAPA COUNTY

VEHICLE COUNTS

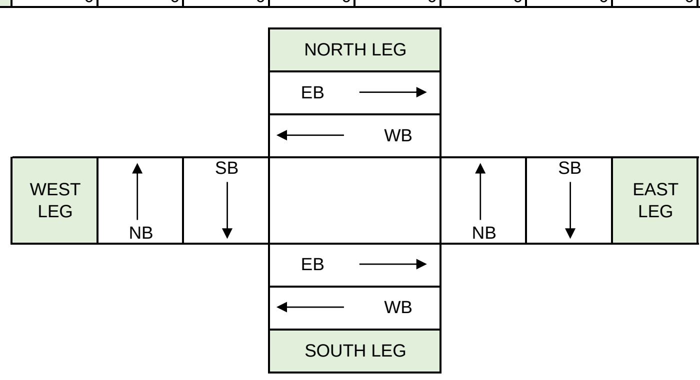
15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	1	253	20	8	0	28	12	152	3	6	0	0	483
345-400	0	195	24	10	1	15	29	161	0	1	0	4	440
400-415	0	169	18	17	0	19	13	172	1	11	2	0	422
415-430	1	154	14	14	0	29	19	193	0	4	0	0	428
430-445	0	154	10	10	1	33	10	160	1	5	0	2	386
445-500	0	183	9	6	0	36	18	146	1	5	0	1	405
500-515	2	198	10	11	0	33	14	156	0	2	0	0	426
515-530	0	168	16	14	0	29	9	150	0	1	1	0	388
530-545	0	219	12	10	0	24	13	141	0	5	1	0	425
545-600	0	199	2	9	0	12	11	129	0	0	0	2	364
600-615	0	156	6	5	0	8	2	124	0	0	0	0	301
615-630	0	108	2	5	0	8	9	114	0	0	0	0	246
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	2	771	76	49	1	91	73	678	4	22	2	4	1773
345-445	1	672	66	51	2	96	71	686	2	21	2	6	1676
400-500	1	660	51	47	1	117	60	671	3	25	2	3	1641
415-515	3	689	43	41	1	131	61	655	2	16	0	3	1645
430-530	2	703	45	41	1	131	51	612	2	13	1	3	1605
445-545	2	768	47	41	0	122	54	593	1	13	2	1	1644
500-600	2	784	40	44	0	98	47	576	0	8	2	2	1603
515-615	0	742	36	38	0	73	35	544	0	6	2	2	1478
530-630	0	682	22	29	0	52	35	508	0	5	1	2	1336

PM Peak Hour 330-430



PEDESTRIAN COUNTS

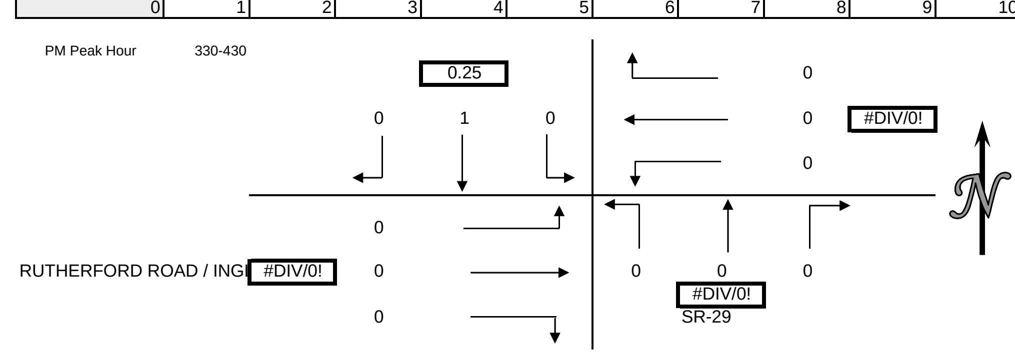
15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	1	0	0	0	0	0	0	0	0	0	0	1
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1	0	0	0	0	0	0	0	0	0	0	1
345-445	0	1	0	0	0	0	0	0	0	0	0	0	1
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78

PM Peak Hour 330-430



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INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

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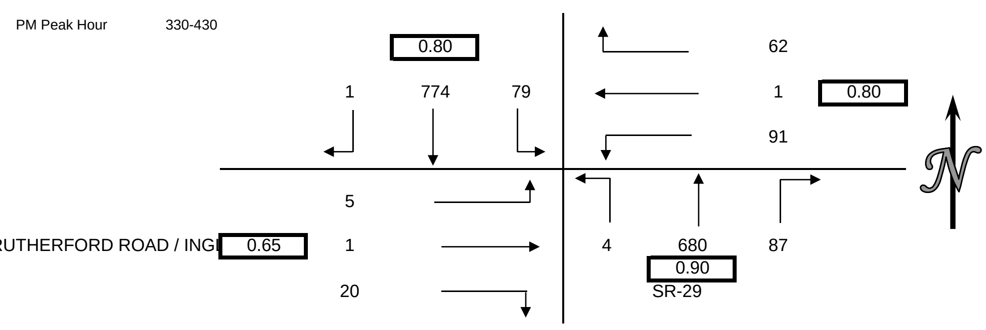
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	RUTHERFORD ROAD / INGLENOOK WINERY DRIVEWAY
CITY:		NAPA COUNTY

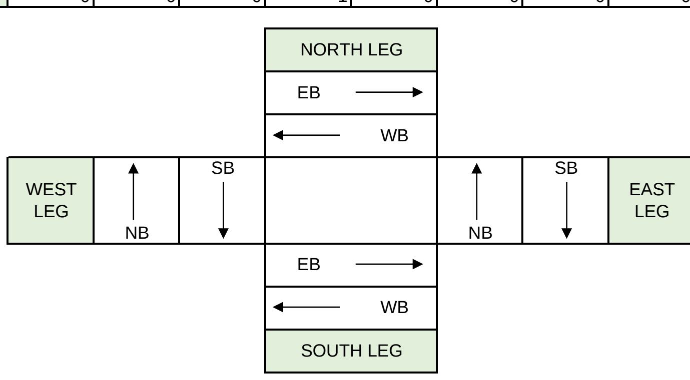
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	243	25	15	1	21	27	183	3	7	0	2	527
345-400	0	172	24	18	0	15	16	167	0	3	0	2	417
400-415	0	163	13	16	0	20	26	157	0	8	1	1	405
415-430	1	196	17	13	0	35	18	173	1	2	0	0	456
430-445	0	180	11	11	0	39	16	142	1	5	0	0	405
445-500	0	184	16	2	0	29	16	146	0	2	0	0	395
500-515	0	183	5	13	0	38	14	144	0	5	1	0	403
515-530	0	189	7	7	0	36	17	151	0	2	0	1	410
530-545	0	219	13	4	0	46	11	172	0	2	1	1	469
545-600	0	228	7	3	0	22	9	143	0	1	0	3	416
600-615	0	178	4	9	0	15	9	110	4	5	1	1	336
615-630	0	163	17	1	0	6	28	123	0	2	0	0	340
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	1	774	79	62	1	91	87	680	4	20	1	5	1805
345-445	1	711	65	58	0	109	76	639	2	18	1	3	1683
400-500	1	723	57	42	0	123	76	618	2	17	1	1	1661
415-515	1	743	49	39	0	141	64	605	2	14	1	0	1659
430-530	0	736	39	33	0	142	63	583	1	14	1	1	1613
445-545	0	775	41	26	0	149	58	613	0	11	2	2	1677
500-600	0	819	32	27	0	142	51	610	0	10	2	5	1698
515-615	0	814	31	23	0	119	46	576	4	10	2	6	1631
530-630	0	788	41	17	0	89	57	548	4	10	2	5	1561



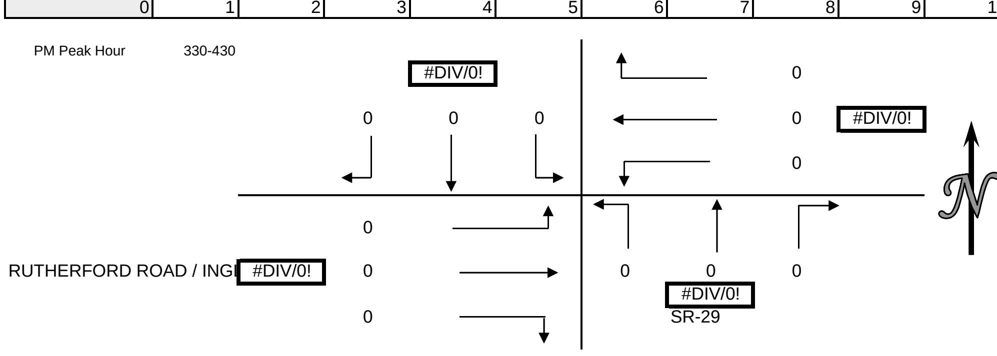
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	1	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	1	0	0	0	0	0
500-600	0	0	0	1	0	0	0	0	0
515-615	0	0	0	1	0	0	0	0	0
530-630	0	0	0	1	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

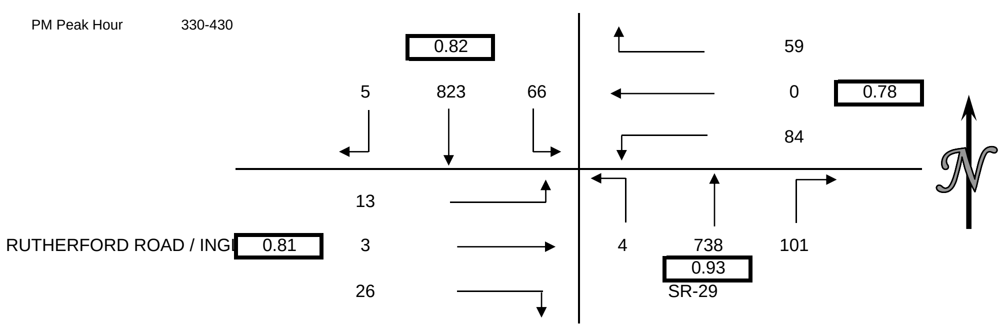
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		THURSDAY MAY 23, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	RUTHERFORD ROAD / INGLENOOK WINERY DRIVEWAY
CITY:		NAPA COUNTY

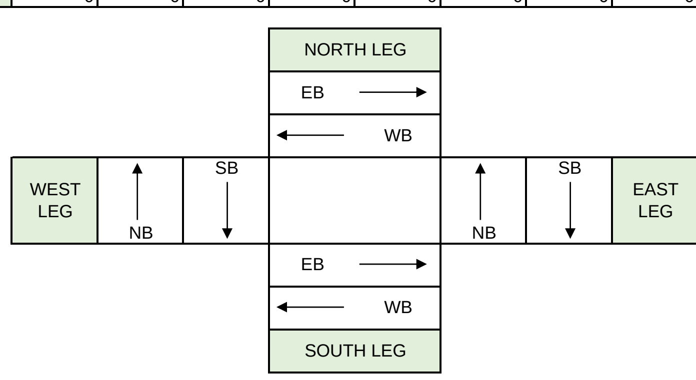
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	233	15	16	0	21	26	200	1	8	0	2	522
345-400	3	251	17	11	0	15	22	196	1	7	0	2	525
400-415	0	188	22	19	0	27	32	169	2	6	3	4	472
415-430	2	151	12	13	0	21	21	173	0	5	0	5	403
430-445	1	200	11	16	0	37	12	158	0	5	0	0	440
445-500	0	147	13	8	0	27	21	163	1	3	2	1	386
500-515	0	185	6	8	0	33	18	160	1	1	0	2	414
515-530	0	177	9	11	0	38	20	169	2	7	1	1	435
530-545	0	214	9	14	0	18	19	167	0	3	0	1	445
545-600	0	224	11	6	0	15	12	140	1	0	0	0	409
600-615	0	192	10	7	0	7	13	127	1	1	0	1	359
615-630	0	176	8	6	0	20	7	124	1	4	1	0	347
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	5	823	66	59	0	84	101	738	4	26	3	13	1922
345-445	6	790	62	59	0	100	87	696	3	23	3	11	1840
400-500	3	686	58	56	0	112	86	663	3	19	5	10	1701
415-515	3	683	42	45	0	118	72	654	2	14	2	8	1643
430-530	1	709	39	43	0	135	71	650	4	16	3	4	1675
445-545	0	723	37	41	0	116	78	659	4	14	3	5	1680
500-600	0	800	35	39	0	104	69	636	4	11	1	4	1703
515-615	0	807	39	38	0	78	64	603	4	11	1	3	1648
530-630	0	806	38	33	0	60	51	558	3	8	1	2	1560



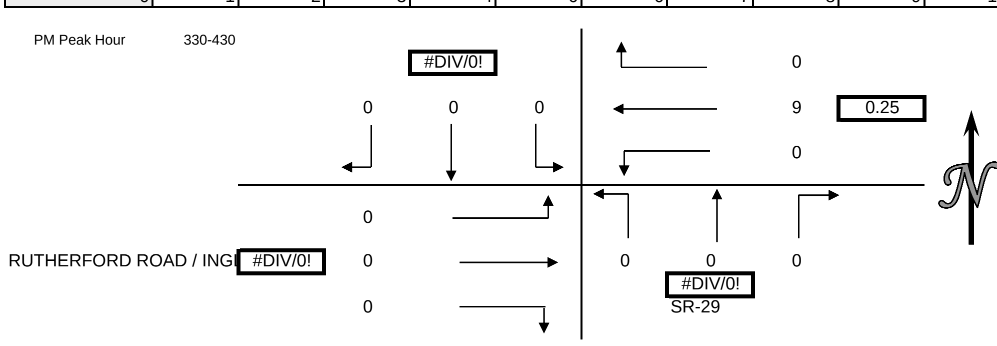
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	2	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	2	0	0	0	0	0	0	0	0
415-515	2	0	0	0	0	0	0	0	0
430-530	2	0	0	0	0	0	0	0	0
445-545	2	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	9	0	0	0	0	0	0	0	9
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	1	0	0	0	0	0	0	0	1
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	1	0	0	0	0	0	0	0	1
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	9	0	0	0	0	0	0	0	9
345-445	0	0	0	0	1	0	0	0	0	0	0	0	1
400-500	0	0	0	0	1	0	0	0	0	0	0	0	1
415-515	0	0	0	0	1	0	0	0	0	0	0	0	1
430-530	0	0	0	0	1	0	0	0	0	0	0	0	1
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	1	0	0	0	0	0	0	0	1
0	1	2	3	4	6	6	7	8	9	10	11	12	79



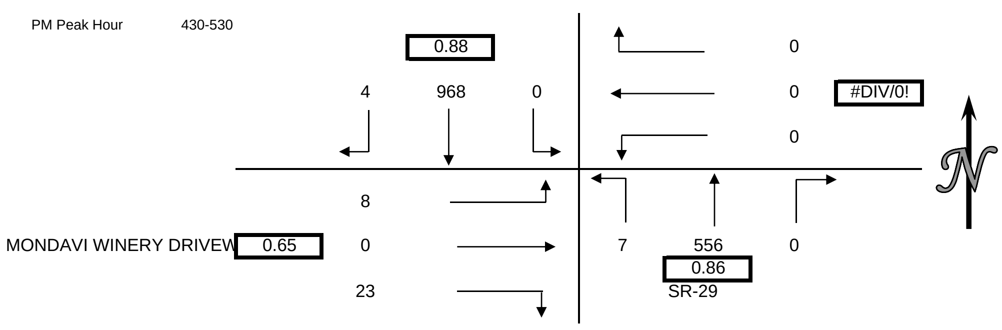
WILTEC Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		TUESDAY MAY 21, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	MONDAVI WINERY DRIVEWAY
CITY:		NAPA COUNTY

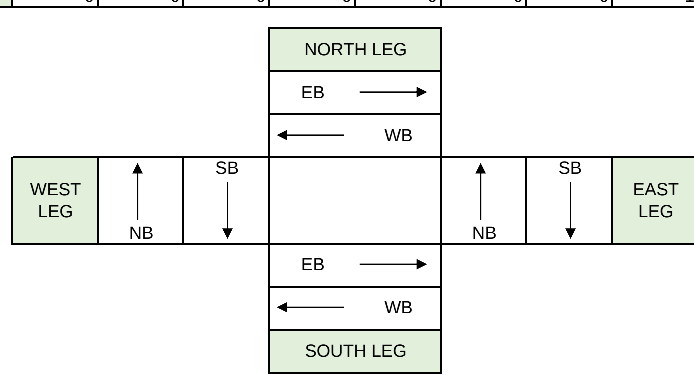
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	4	189	0	0	0	0	0	181	4	8	0	4	390
345-400	5	225	0	0	0	0	0	173	5	6	0	1	415
400-415	1	217	0	0	0	0	0	129	1	5	0	4	357
415-430	2	187	0	0	0	0	0	187	3	10	0	0	389
430-445	4	207	0	0	0	0	0	150	2	2	0	5	370
445-500	0	246	0	0	0	0	0	138	2	8	0	0	394
500-515	0	239	0	0	0	0	0	105	2	10	0	2	358
515-530	0	276	0	0	0	0	0	163	1	3	0	1	444
530-545	0	251	0	0	0	0	0	135	0	6	0	0	392
545-600	2	262	0	0	0	0	0	145	1	9	0	1	420
600-615	0	200	0	0	0	0	0	127	3	8	0	0	338
615-630	1	147	0	0	0	0	0	109	0	2	0	1	260
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	12	818	0	0	0	0	0	670	13	29	0	9	1551
345-445	12	836	0	0	0	0	0	639	11	23	0	10	1531
400-500	7	857	0	0	0	0	0	604	8	25	0	9	1510
415-515	6	879	0	0	0	0	0	580	9	30	0	7	1511
430-530	4	968	0	0	0	0	0	556	7	23	0	8	1566
445-545	0	1012	0	0	0	0	0	541	5	27	0	3	1588
500-600	2	1028	0	0	0	0	0	548	4	28	0	4	1614
515-615	2	989	0	0	0	0	0	570	5	26	0	2	1594
530-630	3	860	0	0	0	0	0	516	4	25	0	2	1410



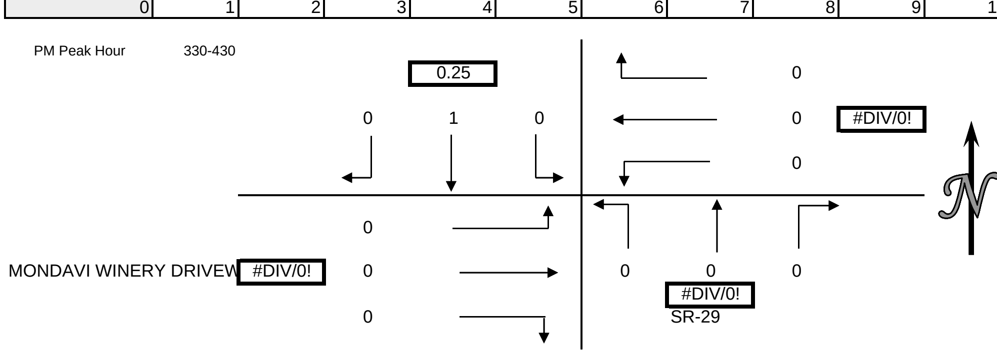
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	1	0	0	1	2
515-530	0	0	0	0	0	0	0	1	1
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	1	1
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	1	0	0	1	2
430-530	0	0	0	0	1	0	0	2	3
445-545	0	0	0	0	1	0	0	2	3
500-600	0	0	0	0	1	0	0	3	4
515-615	0	0	0	0	0	0	0	2	2
530-630	0	0	0	0	0	0	0	1	1



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	1	0	0	0	0	0	0	0	0	0	0	1
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1	0	0	0	0	0	0	0	0	0	0	1
345-445	0	1	0	0	0	0	0	0	0	0	0	0	1
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

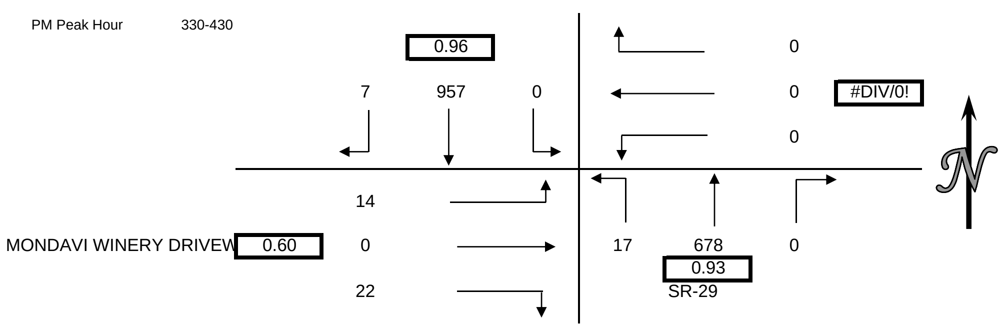
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		WEDNESDAY MAY 22, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	MONDAVI WINERY DRIVEWAY
CITY:		NAPA COUNTY

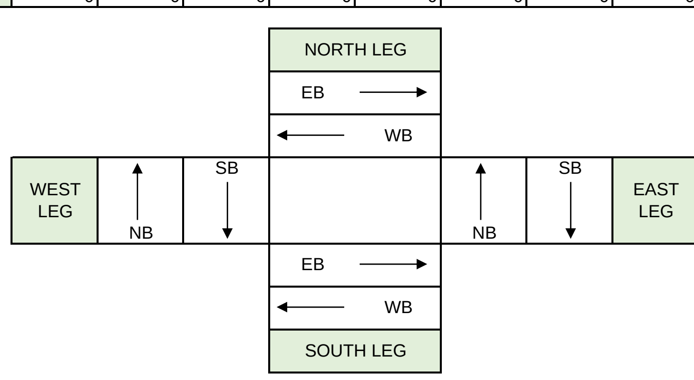
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	238	0	0	0	0	0	180	6	8	0	7	439
345-400	3	233	0	0	0	0	0	165	4	5	0	3	413
400-415	0	239	0	0	0	0	0	158	5	6	0	2	410
415-430	4	247	0	0	0	0	0	175	2	3	0	2	433
430-445	5	238	0	0	0	0	0	148	2	5	0	0	398
445-500	2	258	0	0	0	0	0	146	3	10	0	2	421
500-515	3	256	0	0	0	0	0	97	1	3	0	4	364
515-530	0	266	0	0	0	0	0	152	2	10	0	1	431
530-545	1	259	0	0	0	0	0	172	1	6	0	2	441
545-600	1	228	0	0	0	0	0	150	2	7	0	3	391
600-615	1	234	0	0	0	0	0	114	2	4	0	1	356
615-630	0	116	0	0	0	0	0	117	0	2	0	0	235
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	7	957	0	0	0	0	0	678	17	22	0	14	1695
345-445	12	957	0	0	0	0	0	646	13	19	0	7	1654
400-500	11	982	0	0	0	0	0	627	12	24	0	6	1662
415-515	14	999	0	0	0	0	0	566	8	21	0	8	1616
430-530	10	1018	0	0	0	0	0	543	8	28	0	7	1614
445-545	6	1039	0	0	0	0	0	567	7	29	0	9	1657
500-600	5	1009	0	0	0	0	0	571	6	26	0	10	1627
515-615	3	987	0	0	0	0	0	588	7	27	0	7	1619
530-630	3	837	0	0	0	0	0	553	5	19	0	6	1423



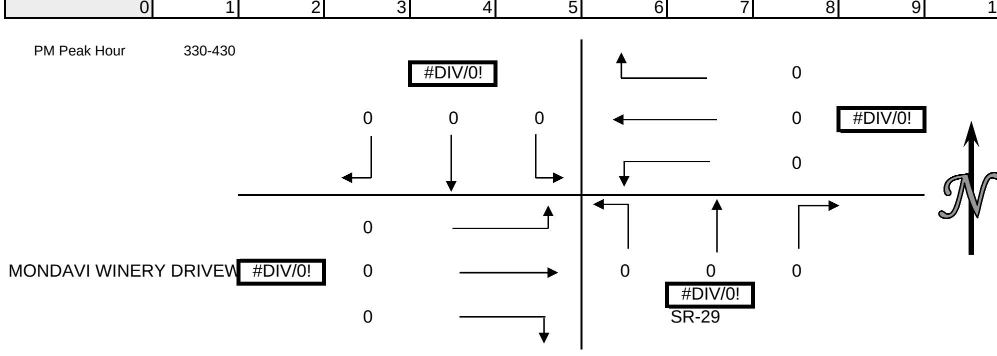
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC Phone: (626) 564-1944 Fax: (626) 564-0969

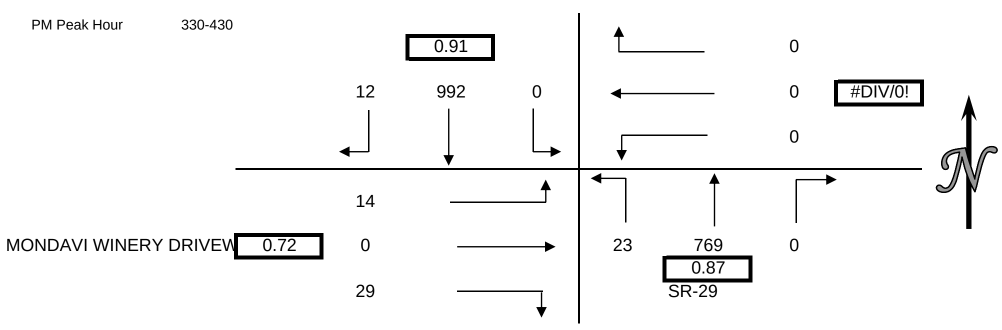
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		THURSDAY MAY 23, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	MONDAVI WINERY DRIVEWAY
CITY:		NAPA COUNTY

VEHICLE COUNTS

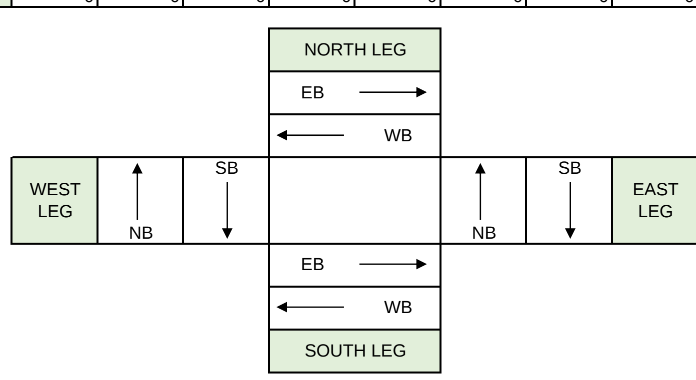
15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	5	260	0	0	0	0	0	223	5	7	0	4	504
345-400	2	273	0	0	0	0	0	197	6	8	0	4	490
400-415	3	236	0	0	0	0	0	166	8	11	0	4	428
415-430	2	223	0	0	0	0	0	183	4	3	0	2	417
430-445	2	226	0	0	0	0	0	155	2	8	0	3	396
445-500	2	179	0	0	0	0	0	159	3	5	0	1	349
500-515	0	212	0	0	0	0	0	171	2	8	0	1	394
515-530	1	193	0	0	0	0	0	183	2	6	0	3	388
530-545	0	249	0	0	0	0	0	168	1	5	0	7	430
545-600	1	267	0	0	0	0	0	133	2	5	0	0	408
600-615	0	273	0	0	0	0	0	138	2	8	0	1	422
615-630	0	220	0	0	0	0	0	124	0	2	0	0	346
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	12	992	0	0	0	0	0	769	23	29	0	14	1839
345-445	9	958	0	0	0	0	0	701	20	30	0	13	1731
400-500	9	864	0	0	0	0	0	663	17	27	0	10	1590
415-515	6	840	0	0	0	0	0	668	11	24	0	7	1556
430-530	5	810	0	0	0	0	0	668	9	27	0	8	1527
445-545	3	833	0	0	0	0	0	681	8	24	0	12	1561
500-600	2	921	0	0	0	0	0	655	7	24	0	11	1620
515-615	2	982	0	0	0	0	0	622	7	24	0	11	1648
530-630	1	1009	0	0	0	0	0	563	5	20	0	8	1606

PM Peak Hour 330-430



PEDESTRIAN COUNTS

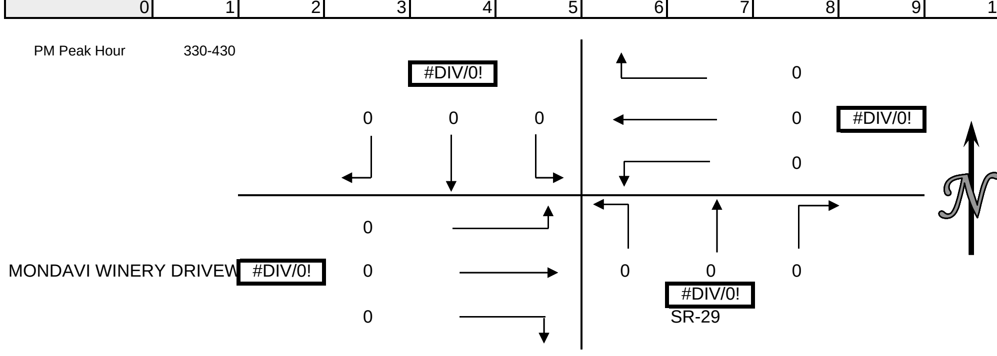
15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	3	0	3
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	3	0	3
445-545	0	0	0	0	0	0	3	0	3
500-600	0	0	0	0	0	0	3	0	3
515-615	0	0	0	0	0	0	3	0	3
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78

PM Peak Hour 330-430



WILTEC

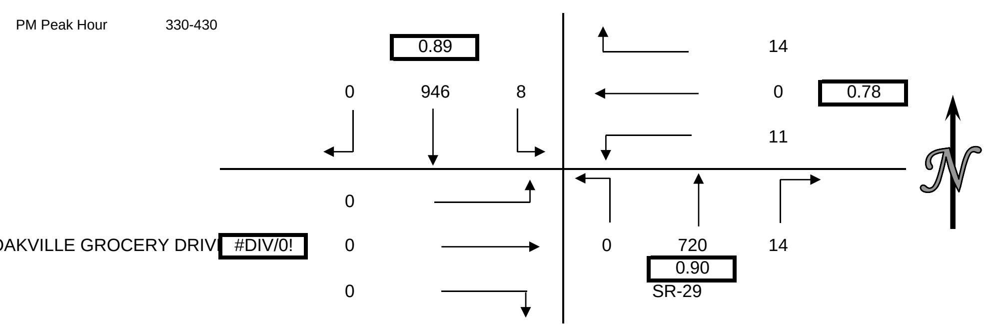
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		TUESDAY MAY 21, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	OAKVILLE GROCERY DRIVEWAYS
CITY:		NAPA COUNTY

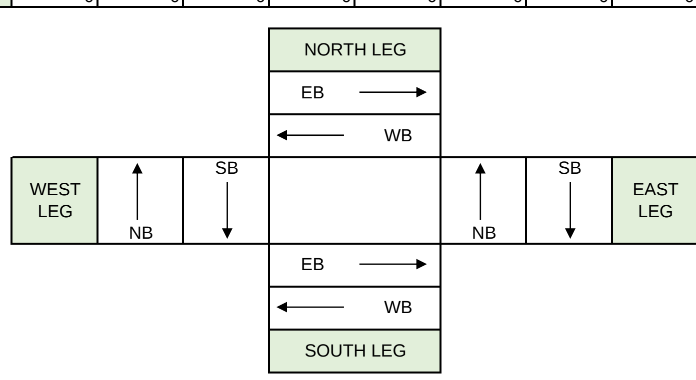
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	264	3	4	0	2	5	193	0	0	0	0	471
345-400	0	238	2	4	0	3	3	200	0	0	0	0	450
400-415	0	234	2	3	0	5	6	125	0	0	0	0	375
415-430	0	210	1	3	0	1	0	202	0	0	0	0	417
430-445	0	258	1	2	0	4	4	165	0	0	0	0	434
445-500	0	260	0	5	0	4	5	133	0	0	0	0	407
500-515	0	251	0	1	0	2	1	158	0	0	0	0	413
515-530	0	263	0	3	0	4	1	144	0	0	0	0	415
530-545	0	268	0	0	0	2	0	156	0	0	0	0	426
545-600	0	272	0	0	0	1	0	124	0	0	0	0	397
600-615	0	213	1	1	0	0	0	121	0	0	0	0	336
615-630	0	151	0	0	0	0	1	112	0	0	0	0	264
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	946	8	14	0	11	14	720	0	0	0	0	1713
345-445	0	940	6	12	0	13	13	692	0	0	0	0	1676
400-500	0	962	4	13	0	14	15	625	0	0	0	0	1633
415-515	0	979	2	11	0	11	10	658	0	0	0	0	1671
430-530	0	1032	1	11	0	14	11	600	0	0	0	0	1669
445-545	0	1042	0	9	0	12	7	591	0	0	0	0	1661
500-600	0	1054	0	4	0	9	2	582	0	0	0	0	1651
515-615	0	1016	1	4	0	7	1	545	0	0	0	0	1574
530-630	0	904	1	1	0	3	1	513	0	0	0	0	1423



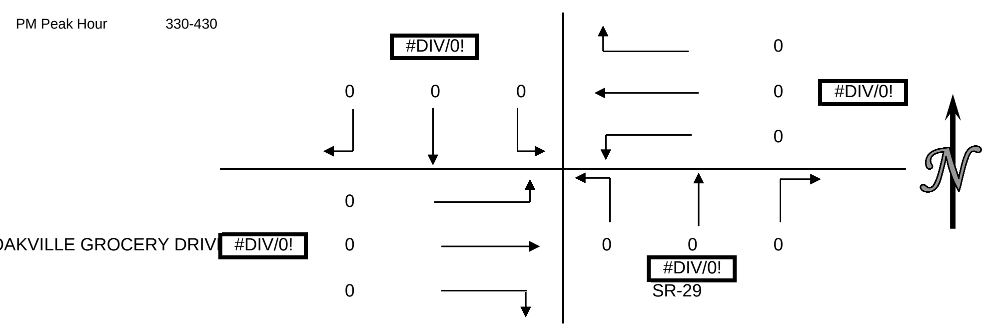
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	1	0	0	0	0	0	0	0	0
515-530	1	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	1	0	0	0	0	0	0	0	0
430-530	2	0	0	0	0	0	0	0	0
445-545	2	0	0	0	0	0	0	0	0
500-600	2	0	0	0	0	0	0	0	0
515-615	1	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

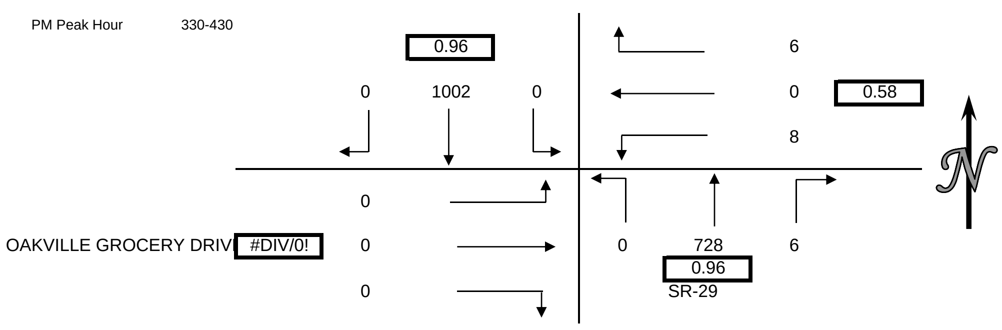
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		WEDNESDAY MAY 22, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	OAKVILLE GROCERY DRIVEWAYS
CITY:		NAPA COUNTY

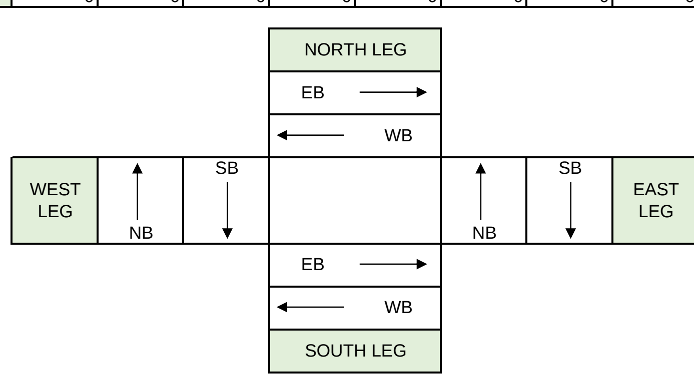
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	255	0	3	0	3	2	190	0	0	0	0	453
345-400	0	262	0	2	0	2	3	180	0	0	0	0	449
400-415	0	229	0	1	0	2	0	170	0	0	0	0	402
415-430	0	256	0	0	0	1	1	188	0	0	0	0	446
430-445	0	256	3	1	0	1	4	149	0	0	0	0	414
445-500	0	262	0	4	0	1	3	157	0	0	0	0	427
500-515	0	267	0	2	0	5	3	150	0	0	0	0	427
515-530	0	283	0	0	0	2	2	144	0	0	0	0	431
530-545	0	263	0	1	0	0	1	191	0	0	0	0	456
545-600	0	238	1	1	0	1	1	135	0	0	0	0	377
600-615	0	251	0	0	0	0	1	132	0	0	0	0	384
615-630	0	164	0	1	0	1	0	127	0	0	0	0	293
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1002	0	6	0	8	6	728	0	0	0	0	1750
345-445	0	1003	3	4	0	6	8	687	0	0	0	0	1711
400-500	0	1003	3	6	0	5	8	664	0	0	0	0	1689
415-515	0	1041	3	7	0	8	11	644	0	0	0	0	1714
430-530	0	1068	3	7	0	9	12	600	0	0	0	0	1699
445-545	0	1075	0	7	0	8	9	642	0	0	0	0	1741
500-600	0	1051	1	4	0	8	7	620	0	0	0	0	1691
515-615	0	1035	1	2	0	3	5	602	0	0	0	0	1648
530-630	0	916	1	3	0	2	3	585	0	0	0	0	1510



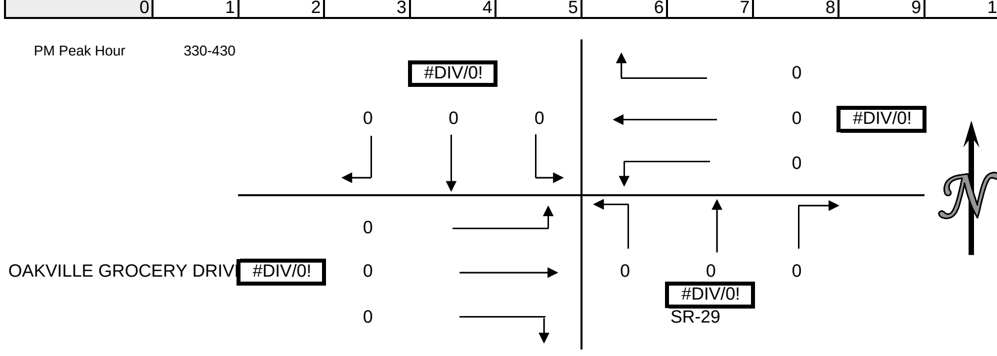
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

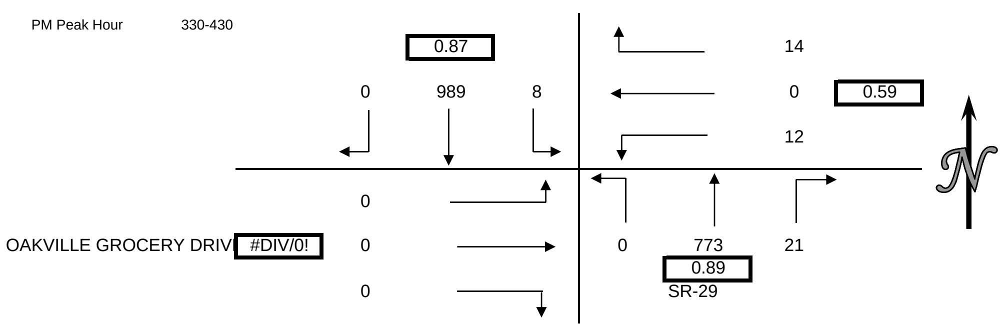
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		THURSDAY MAY 23, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SR-29
	E/W	OAKVILLE GROCERY DRIVEWAYS
CITY:		NAPA COUNTY

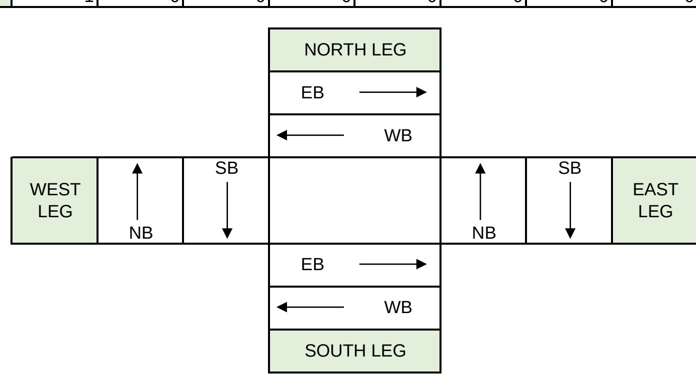
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	282	4	4	0	7	8	214	0	0	0	0	519
345-400	0	257	1	4	0	0	4	210	0	0	0	0	476
400-415	0	232	2	1	0	2	1	170	0	0	0	0	408
415-430	0	218	1	5	0	3	8	179	0	0	0	0	414
430-445	0	218	1	3	0	2	8	153	0	0	0	0	385
445-500	0	258	1	6	0	3	2	173	0	0	0	0	443
500-515	0	262	3	9	0	4	5	154	0	0	0	0	437
515-530	0	255	0	2	0	6	1	180	0	0	0	0	444
530-545	0	254	1	2	0	3	1	179	0	0	0	0	440
545-600	0	259	1	1	0	0	0	132	0	0	0	0	393
600-615	0	262	1	1	0	1	1	150	0	0	0	0	416
615-630	0	203	1	0	0	0	0	116	0	0	0	0	320
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	989	8	14	0	12	21	773	0	0	0	0	1817
345-445	0	925	5	13	0	7	21	712	0	0	0	0	1683
400-500	0	926	5	15	0	10	19	675	0	0	0	0	1650
415-515	0	956	6	23	0	12	23	659	0	0	0	0	1679
430-530	0	993	5	20	0	15	16	660	0	0	0	0	1709
445-545	0	1029	5	19	0	16	9	686	0	0	0	0	1764
500-600	0	1030	5	14	0	13	7	645	0	0	0	0	1714
515-615	0	1030	3	6	0	10	3	641	0	0	0	0	1693
530-630	0	978	4	4	0	4	2	577	0	0	0	0	1569



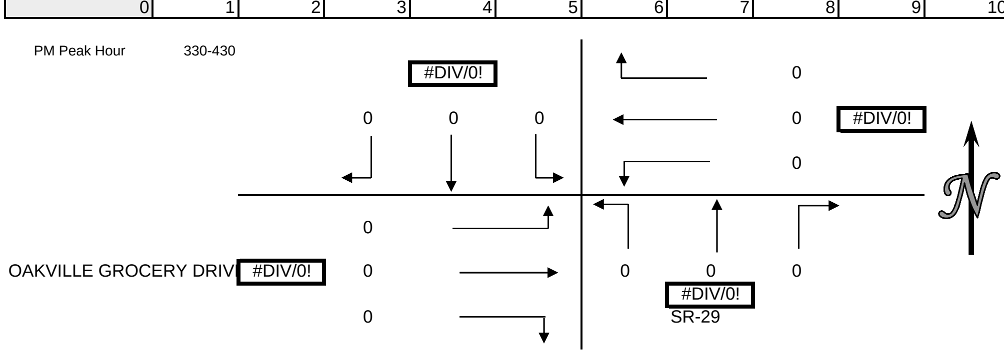
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	1	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	1	0	0	0	0	0	0	0	0
530-630	1	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



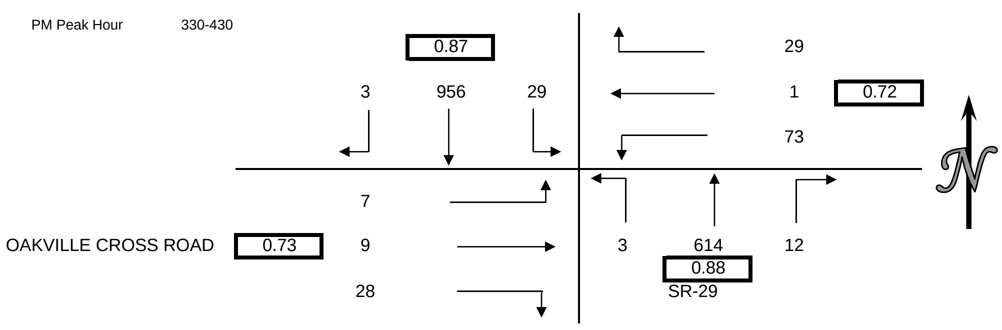
WILTEC
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT: KIMLEY-HORN
PROJECT: NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE: TUESDAY MAY 21, 2019
PERIOD" 3:30 PM TO 6:30 PM
INTERSECTION: N/S SR-29
E/W OAKVILLE CROSS ROAD
CITY: NAPA COUNTY

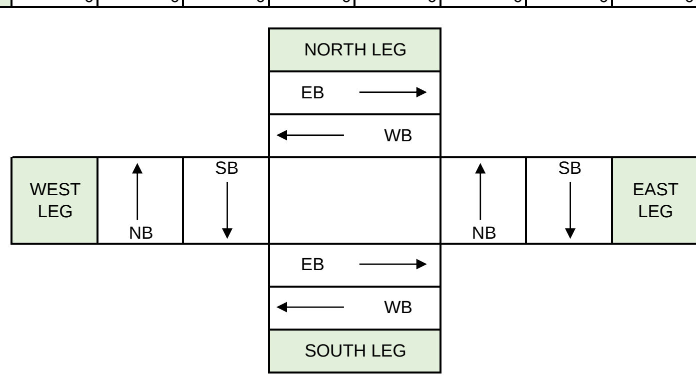
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	272	12	10	0	26	4	159	0	12	2	1	498
345-400	1	238	5	5	0	15	2	171	0	5	1	3	446
400-415	2	231	6	8	0	17	3	111	1	8	5	1	393
415-430	0	215	6	6	1	15	3	173	2	3	1	2	427
430-445	2	251	11	8	0	13	9	144	0	4	0	0	442
445-500	0	266	5	5	0	13	4	118	0	2	0	0	413
500-515	0	252	5	6	0	19	4	128	1	5	1	1	422
515-530	4	265	1	6	0	8	0	124	0	1	0	1	410
530-545	0	263	5	6	0	18	2	124	1	3	0	1	423
545-600	1	276	2	1	0	8	1	110	0	0	0	0	399
600-615	1	207	1	0	0	5	2	105	0	1	0	0	322
615-630	1	162	0	2	0	5	0	96	0	0	0	0	266
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	3	956	29	29	1	73	12	614	3	28	9	7	1764
345-445	5	935	28	27	1	60	17	599	3	20	7	6	1708
400-500	4	963	28	27	1	58	19	546	3	17	6	3	1675
415-515	2	984	27	25	1	60	20	563	3	14	2	3	1704
430-530	6	1034	22	25	0	53	17	514	1	12	1	2	1687
445-545	4	1046	16	23	0	58	10	494	2	11	1	3	1668
500-600	5	1056	13	19	0	53	7	486	2	9	1	3	1654
515-615	6	1011	9	13	0	39	5	463	1	5	0	2	1554
530-630	3	908	8	9	0	36	5	435	1	4	0	1	1410



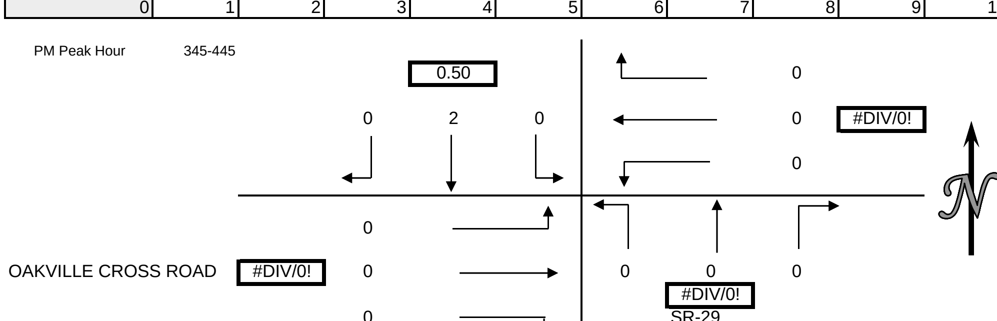
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	1	0	0	0	0	0	0	0	0	0	0	1
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	1	0	0	0	0	0	0	0	0	0	0	1
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	1	0	0	0	0	0	0	0	0	0	0	1
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1	0	0	0	0	0	0	0	0	0	0	1
345-445	0	2	0	0	0	0	0	0	0	0	0	0	2
400-500	0	2	0	0	0	0	0	0	0	0	0	0	2
415-515	0	1	0	0	0	0	0	0	0	0	0	0	1
430-530	0	2	0	0	0	0	0	0	0	0	0	0	2
445-545	0	1	0	0	0	0	0	0	0	0	0	0	1
500-600	0	1	0	0	0	0	0	0	0	0	0	0	1
515-615	0	1	0	0	0	0	0	0	0	0	0	0	1
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

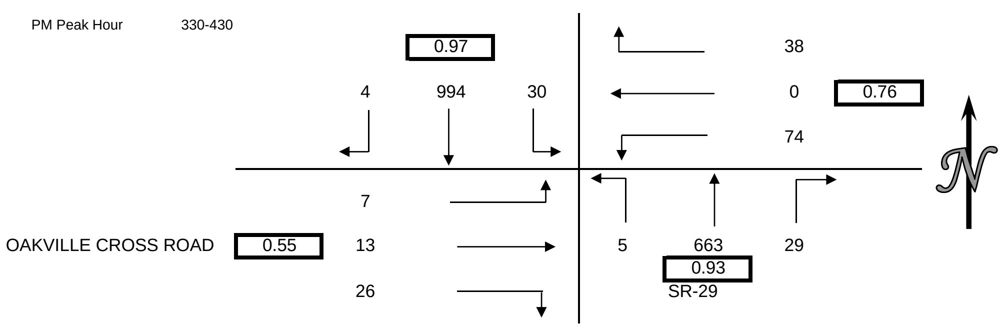
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT: KIMLEY-HORN
PROJECT: NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE: WEDNESDAY MAY 22, 2019
PERIOD" 3:30 PM TO 6:30 PM
INTERSECTION: N/S SR-29
E/W OAKVILLE CROSS ROAD
CITY: NAPA COUNTY

VEHICLE COUNTS

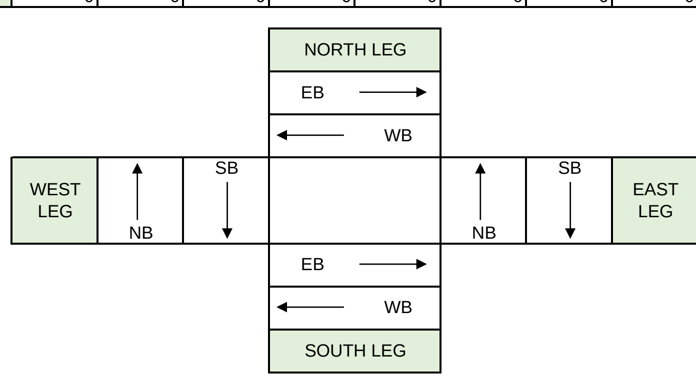
15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	2	251	9	10	0	27	7	180	1	11	2	3	503
345-400	1	258	5	8	0	14	8	171	1	2	1	0	469
400-415	1	229	11	10	0	18	10	138	1	8	10	3	439
415-430	0	256	5	10	0	15	4	174	2	5	0	1	472
430-445	0	256	8	9	1	22	4	133	0	2	0	0	435
445-500	1	261	9	3	0	9	3	154	0	1	0	1	442
500-515	1	276	4	9	0	17	4	150	0	2	0	1	464
515-530	1	257	7	11	0	9	5	138	0	6	0	0	434
530-545	0	252	1	8	0	9	6	170	0	0	0	1	447
545-600	0	251	4	1	0	12	4	140	0	0	0	0	412
600-615	0	253	5	2	1	5	3	115	1	1	0	1	387
615-630	1	111	0	1	0	3	1	121	0	1	0	0	239
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	4	994	30	38	0	74	29	663	5	26	13	7	1883
345-445	2	999	29	37	1	69	26	616	4	17	11	4	1815
400-500	2	1002	33	32	1	64	21	599	3	16	10	5	1788
415-515	2	1049	26	31	1	63	15	611	2	10	0	3	1813
430-530	3	1050	28	32	1	57	16	575	0	11	0	2	1775
445-545	3	1046	21	31	0	44	18	612	0	9	0	3	1787
500-600	2	1036	16	29	0	47	19	598	0	8	0	2	1757
515-615	1	1013	17	22	1	35	18	563	1	7	0	2	1680
530-630	1	867	10	12	1	29	14	546	1	2	0	2	1485

PM Peak Hour 330-430



PEDESTRIAN COUNTS

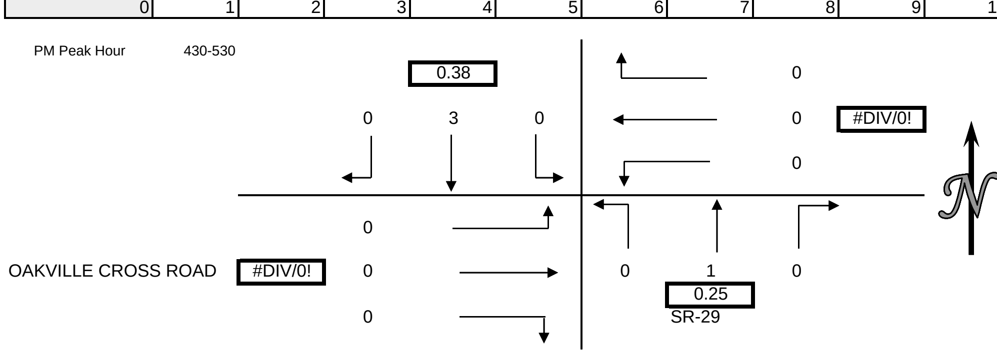
15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	2	1	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	2	1	0	0	0	0	0
400-500	0	0	2	1	0	0	0	0	0
415-515	0	0	2	1	0	0	0	0	0
430-530	0	0	2	1	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	1	0	0	0	0	0	1	0	0	0	0	2
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	2	0	0	0	0	0	0	0	0	0	0	2
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	1	0	0	0	0	0	1	0	0	0	0	2
415-515	0	1	0	0	0	0	0	1	0	0	0	0	2
430-530	0	3	0	0	0	0	0	1	0	0	0	0	4
445-545	0	3	0	0	0	0	0	1	0	0	0	0	4
500-600	0	2	0	0	0	0	0	0	0	0	0	0	2
515-615	0	2	0	0	0	0	0	0	0	0	0	0	2
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78

PM Peak Hour 430-530



WILTEC

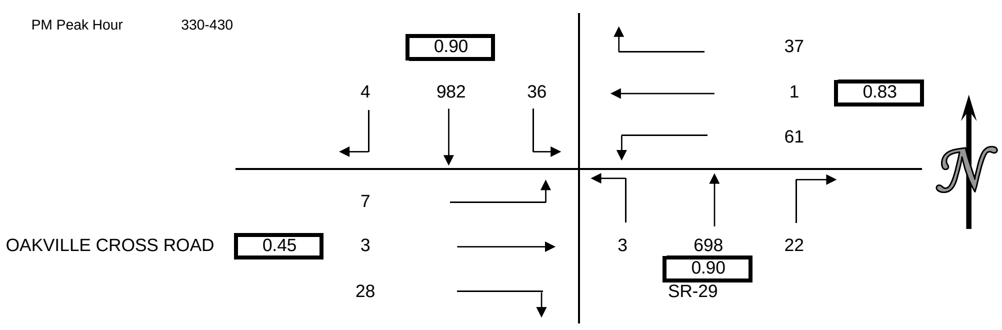
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT: KIMLEY-HORN
PROJECT: NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE: THURSDAY MAY 23, 2019
PERIOD" 3:30 PM TO 6:30 PM
INTERSECTION: N/S SR-29
E/W OAKVILLE CROSS ROAD
CITY: NAPA COUNTY

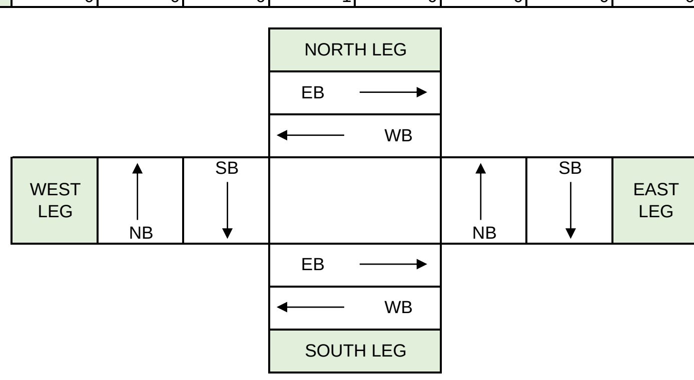
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	2	274	9	11	0	19	7	182	1	18	0	3	526
345-400	1	259	9	4	0	14	2	199	0	2	0	1	491
400-415	0	227	8	11	0	18	7	161	0	3	2	2	439
415-430	1	222	10	11	1	10	6	156	2	5	1	1	426
430-445	0	252	8	17	0	16	7	146	0	4	0	3	453
445-500	0	209	5	6	0	9	5	158	0	1	1	0	394
500-515	0	263	4	7	0	17	4	152	1	3	0	2	453
515-530	0	251	2	3	0	5	8	170	0	1	0	1	441
530-545	0	252	3	8	0	20	6	161	0	0	0	0	450
545-600	0	243	4	1	0	4	2	131	0	1	0	3	389
600-615	0	273	5	2	0	8	5	101	0	2	0	0	396
615-630	0	199	5	3	0	11	8	117	0	0	0	0	343
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	4	982	36	37	1	61	22	698	3	28	3	7	1882
345-445	2	960	35	43	1	58	22	662	2	14	3	7	1809
400-500	1	910	31	45	1	53	25	621	2	13	4	6	1712
415-515	1	946	27	41	1	52	22	612	3	13	2	6	1726
430-530	0	975	19	33	0	47	24	626	1	9	1	6	1741
445-545	0	975	14	24	0	51	23	641	1	5	1	3	1738
500-600	0	1009	13	19	0	46	20	614	1	5	0	6	1733
515-615	0	1019	14	14	0	37	21	563	0	4	0	4	1676
530-630	0	967	17	14	0	43	21	510	0	3	0	3	1578



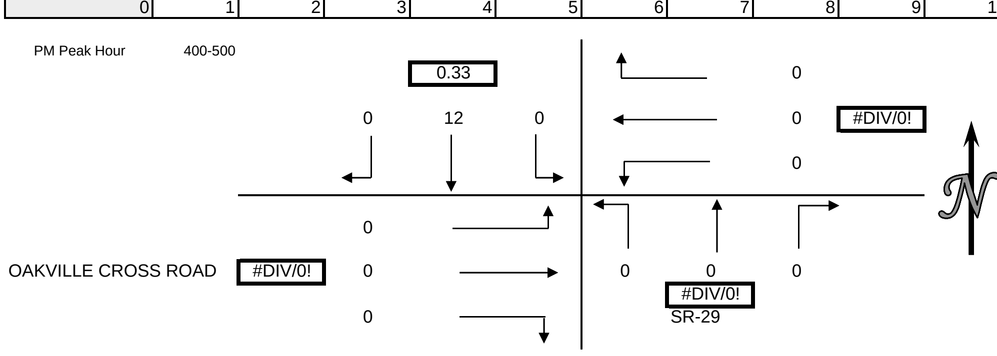
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	1	0	0	0	0	0	0
400-415	0	0	1	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	1	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	2	0	0	0	0	0	0
345-445	0	0	2	0	0	0	0	0	0
400-500	0	0	1	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	1	0	0	0	0	0
500-600	0	0	0	1	0	0	0	0	0
515-615	0	0	0	1	0	0	0	0	0
530-630	0	0	0	1	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	1	0	0	0	0	0	0	0	0	0	0	1
400-415	0	9	0	0	0	0	0	0	0	0	0	0	9
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	1	0	0	0	0	0	0	0	0	0	0	1
445-500	0	2	0	0	0	0	0	0	0	0	0	0	2
500-515	0	0	1	0	0	0	0	0	0	0	0	0	1
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	10	0	0	0	0	0	0	0	0	0	0	10
345-445	0	11	0	0	0	0	0	0	0	0	0	0	11
400-500	0	12	0	0	0	0	0	0	0	0	0	0	12
415-515	0	3	1	0	0	0	0	0	0	0	0	0	4
430-530	0	3	1	0	0	0	0	0	0	0	0	0	4
445-545	0	2	1	0	0	0	0	0	0	0	0	0	3
500-600	0	0	1	0	0	0	0	0	0	0	0	0	1
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



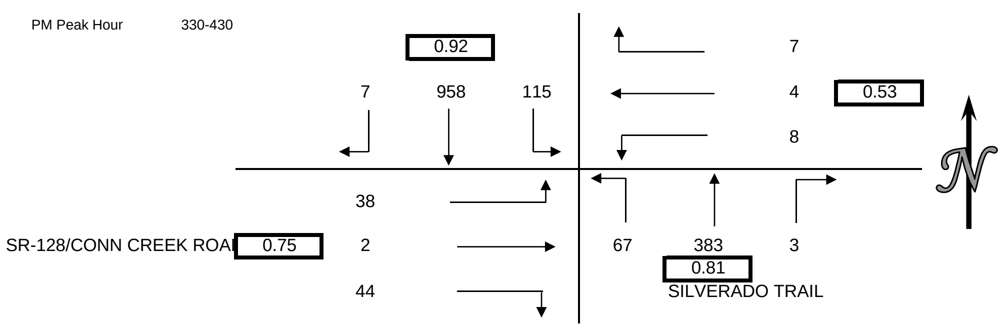
WILTEC Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		TUESDAY MAY 21, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SR-128/CONN CREEK ROAD
CITY:		NAPA COUNTY

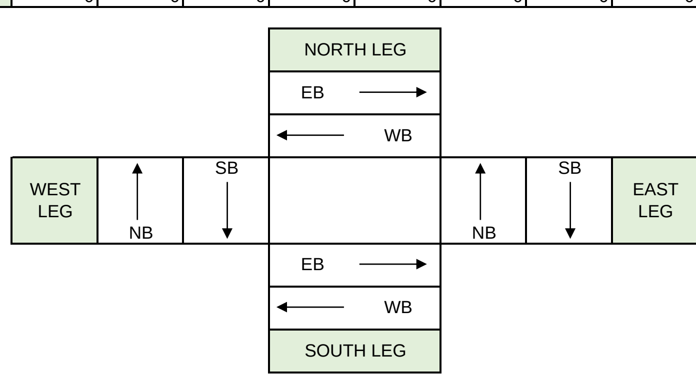
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	2	242	10	3	1	5	1	109	2	7	1	10	393
345-400	0	281	11	0	0	0	1	93	3	9	0	9	407
400-415	2	249	34	1	2	2	1	88	16	16	0	12	423
415-430	3	186	60	3	1	1	0	93	46	12	1	7	413
430-445	1	173	66	1	1	4	0	99	33	7	0	5	390
445-500	1	178	98	2	0	3	0	89	14	1	0	12	398
500-515	1	163	63	2	1	4	0	64	11	5	0	3	317
515-530	1	151	50	3	1	1	0	80	9	5	0	5	306
530-545	0	145	34	0	1	0	0	84	3	1	0	8	276
545-600	0	151	13	0	0	0	0	52	2	8	0	8	234
600-615	0	105	2	0	0	1	0	38	1	1	0	2	150
615-630	1	91	2	0	0	0	0	45	3	3	0	4	149
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	7	958	115	7	4	8	3	383	67	44	2	38	1636
345-445	6	889	171	5	4	7	2	373	98	44	1	33	1633
400-500	7	786	258	7	4	10	1	369	109	36	1	36	1624
415-515	6	700	287	8	3	12	0	345	104	25	1	27	1518
430-530	4	665	277	8	3	12	0	332	67	18	0	25	1411
445-545	3	637	245	7	3	8	0	317	37	12	0	28	1297
500-600	2	610	160	5	3	5	0	280	25	19	0	24	1133
515-615	1	552	99	3	2	2	0	254	15	15	0	23	966
530-630	1	492	51	0	1	1	0	219	9	13	0	22	809



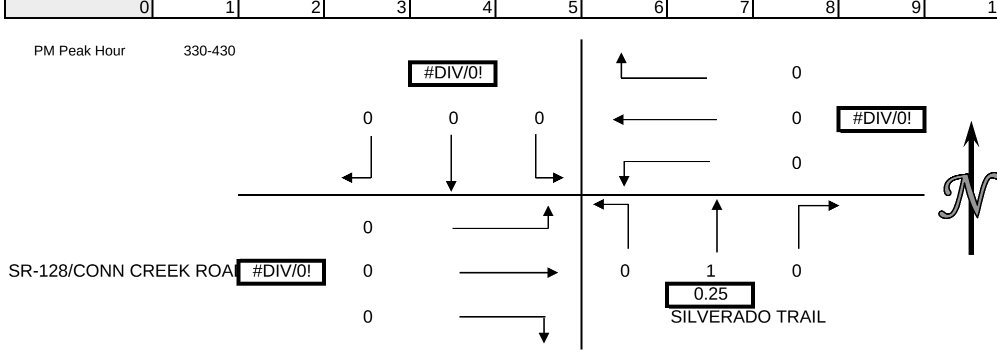
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	1	0	1
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	1	0	1
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	1	0	0	0	0	1
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	1	0	0	0	0	1
345-445	0	0	0	0	0	0	0	1	0	0	0	0	1
400-500	0	0	0	0	0	0	0	1	0	0	0	0	1
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

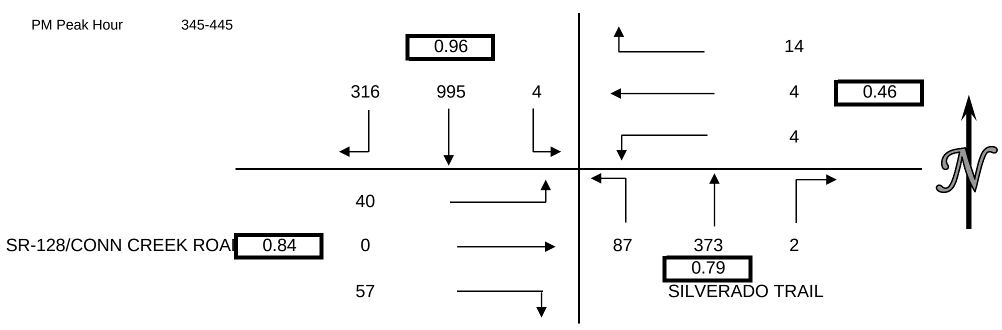
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT: KIMLEY-HORN
PROJECT: NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE: WEDNESDAY MAY 22, 2019
PERIOD" 3:30 PM TO 6:30 PM
INTERSECTION: N/S SILVERADO TRAIL
E/W SR-128/CONN CREEK ROAD
CITY: NAPA COUNTY

VEHICLE COUNTS

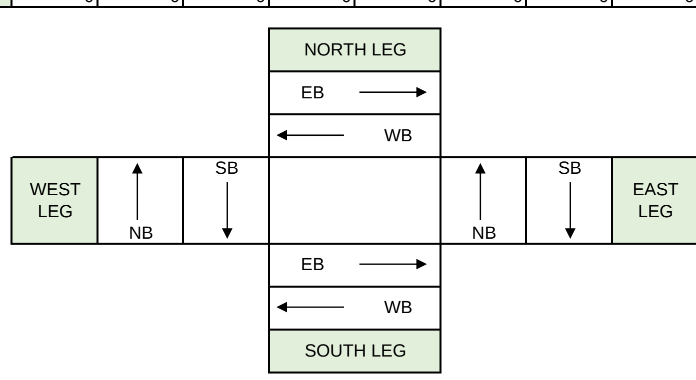
15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	8	296	0	3	0	3	0	124	2	6	0	9	451
345-400	26	288	3	1	0	1	0	81	12	13	0	11	436
400-415	58	285	1	1	0	2	0	99	22	20	0	9	497
415-430	112	216	0	9	2	1	2	115	30	9	0	8	504
430-445	120	206	0	3	2	0	0	78	23	15	0	12	459
445-500	148	167	1	0	0	1	0	89	15	2	0	10	433
500-515	124	165	0	1	1	3	0	81	18	5	0	5	403
515-530	80	164	0	0	0	1	0	95	14	3	0	8	365
530-545	55	188	0	1	0	1	0	76	15	8	0	7	351
545-600	38	158	0	0	0	0	0	65	0	4	0	6	271
600-615	3	109	2	2	0	1	0	54	4	3	0	4	182
615-630	1	117	0	0	0	1	0	50	1	5	0	4	179
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	204	1085	4	14	2	7	2	419	66	48	0	37	1888
345-445	316	995	4	14	4	4	2	373	87	57	0	40	1896
400-500	438	874	2	13	4	4	2	381	90	46	0	39	1893
415-515	504	754	1	13	5	5	2	363	86	31	0	35	1799
430-530	472	702	1	4	3	5	0	343	70	25	0	35	1660
445-545	407	684	1	2	1	6	0	341	62	18	0	30	1552
500-600	297	675	0	2	1	5	0	317	47	20	0	26	1390
515-615	176	619	2	3	0	3	0	290	33	18	0	25	1169
530-630	97	572	2	3	0	3	0	245	20	20	0	21	983

PM Peak Hour 345-445



PEDESTRIAN COUNTS

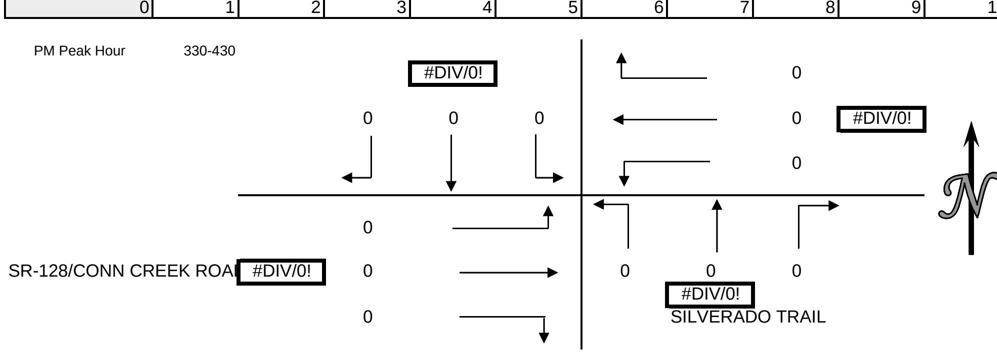
15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	1	1	0	2
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	1	1	0	2
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	1	0	0	0	0	1
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	1	0	0	0	0	1
500-600	0	0	0	0	0	0	0	1	0	0	0	0	1
515-615	0	0	0	0	0	0	0	1	0	0	0	0	1
530-630	0	0	0	0	0	0	0	1	0	0	0	0	1
0	1	2	3	4	5	6	7	8	9	10	11	12	78

PM Peak Hour 330-430



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

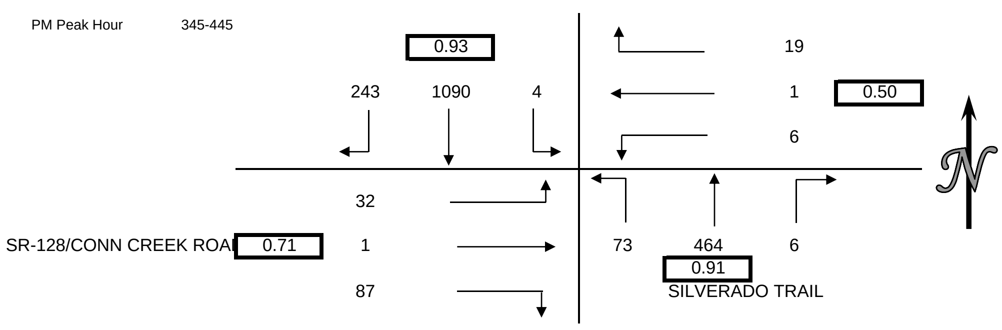
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		THURSDAY MAY 23, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SR-128/CONN CREEK ROAD
CITY:		NAPA COUNTY

VEHICLE COUNTS

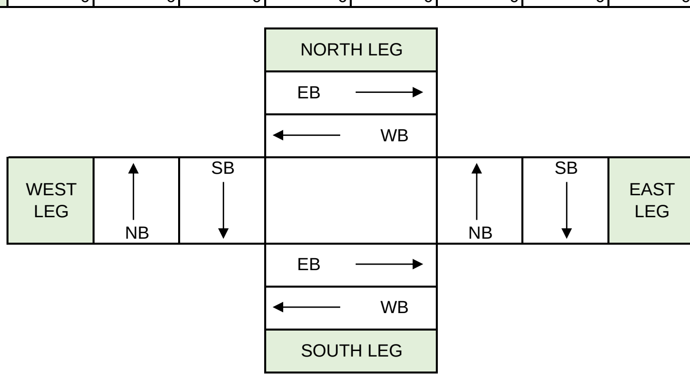
15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	6	294	4	3	0	6	0	116	12	7	0	13	461
345-400	17	294	0	0	1	2	1	104	4	17	0	14	454
400-415	43	281	2	6	0	2	3	116	17	34	1	7	512
415-430	70	269	1	11	0	2	2	125	21	19	0	5	525
430-445	113	246	1	2	0	0	0	119	31	17	0	6	535
445-500	119	180	1	1	1	1	1	94	25	10	0	9	442
500-515	94	155	2	4	0	1	0	118	21	9	0	7	411
515-530	76	169	0	2	0	1	2	102	11	8	0	6	377
530-545	52	186	1	0	1	0	0	78	7	13	0	6	344
545-600	20	171	0	0	0	0	0	78	2	3	0	10	284
600-615	6	142	0	0	0	1	1	80	1	3	0	2	236
615-630	6	114	0	0	0	0	0	82	2	3	0	5	212
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	136	1138	7	20	1	12	6	461	54	77	1	39	1952
345-445	243	1090	4	19	1	6	6	464	73	87	1	32	2026
400-500	345	976	5	20	1	5	6	454	94	80	1	27	2014
415-515	396	850	5	18	1	4	3	456	98	55	0	27	1913
430-530	402	750	4	9	1	3	3	433	88	44	0	28	1765
445-545	341	690	4	7	2	3	3	392	64	40	0	28	1574
500-600	242	681	3	6	1	2	2	376	41	33	0	29	1416
515-615	154	668	1	2	1	2	3	338	21	27	0	24	1241
530-630	84	613	1	0	1	1	1	318	12	22	0	23	1076

PM Peak Hour 345-445



PEDESTRIAN COUNTS

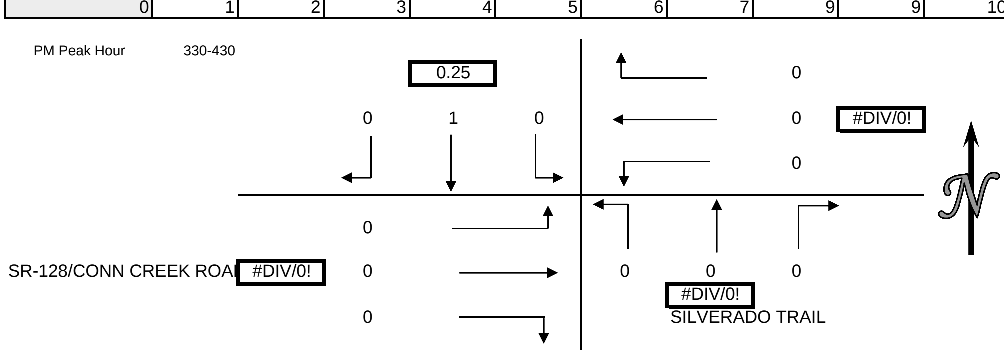
15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	1	0	0	0	0	0	0	0	0	0	0	1
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	1	0	0	0	0	1
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1	0	0	0	0	0	0	0	0	0	0	1
345-445	0	1	0	0	0	0	0	0	0	0	0	0	1
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	1	0	0	0	0	1
0	1	2	3	4	5	6	7	9	9	10	11	12	79

PM Peak Hour 330-430



WILTEC

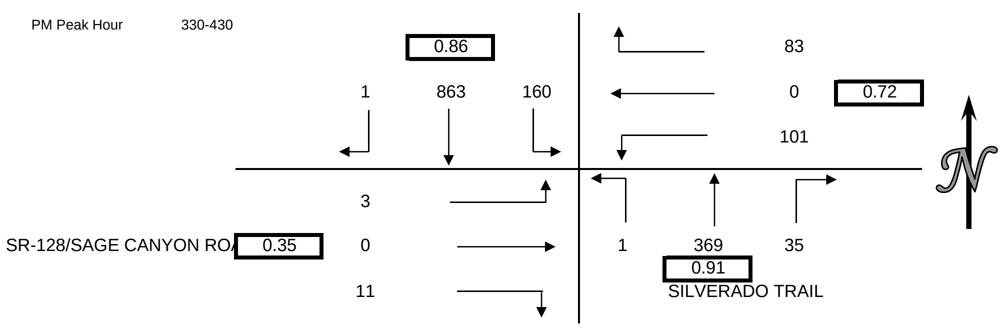
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		TUESDAY MAY 21, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SR-128/SAGE CANYON ROAD
CITY:		NAPA COUNTY

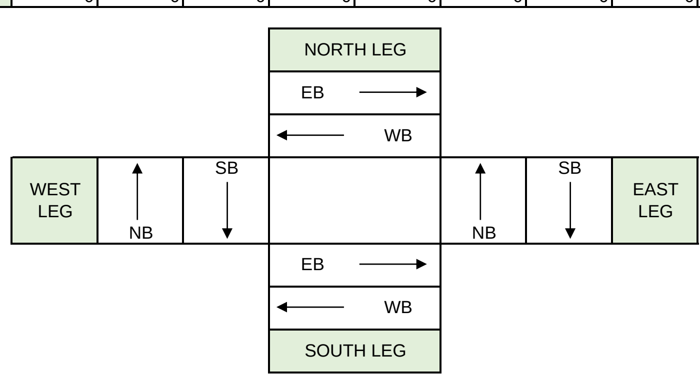
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	1	210	28	14	0	17	6	92	1	9	0	1	379
345-400	0	254	42	14	0	30	5	86	0	1	0	1	433
400-415	0	232	40	16	0	29	15	89	0	1	0	1	423
415-430	0	167	50	39	0	25	9	102	0	0	0	0	392
430-445	1	134	36	25	0	13	31	101	0	0	0	1	342
445-500	0	172	20	15	0	12	18	90	0	0	0	1	328
500-515	0	154	23	4	0	12	9	61	0	0	0	0	263
515-530	0	150	23	12	0	6	8	77	0	0	0	0	276
530-545	0	124	18	7	0	10	9	74	1	2	0	0	245
545-600	0	158	9	4	0	10	7	52	0	0	0	0	240
600-615	0	102	10	2	0	3	8	37	0	0	0	0	162
615-630	0	81	8	6	0	6	6	43	0	0	0	0	150
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	1	863	160	83	0	101	35	369	1	11	0	3	1627
345-445	1	787	168	94	0	97	60	378	0	2	0	3	1590
400-500	1	705	146	95	0	79	73	382	0	1	0	3	1485
415-515	1	627	129	83	0	62	67	354	0	0	0	2	1325
430-530	1	610	102	56	0	43	66	329	0	0	0	2	1209
445-545	0	600	84	38	0	40	44	302	1	2	0	1	1112
500-600	0	586	73	27	0	38	33	264	1	2	0	0	1024
515-615	0	534	60	25	0	29	32	240	1	2	0	0	923
530-630	0	465	45	19	0	29	30	206	1	2	0	0	797



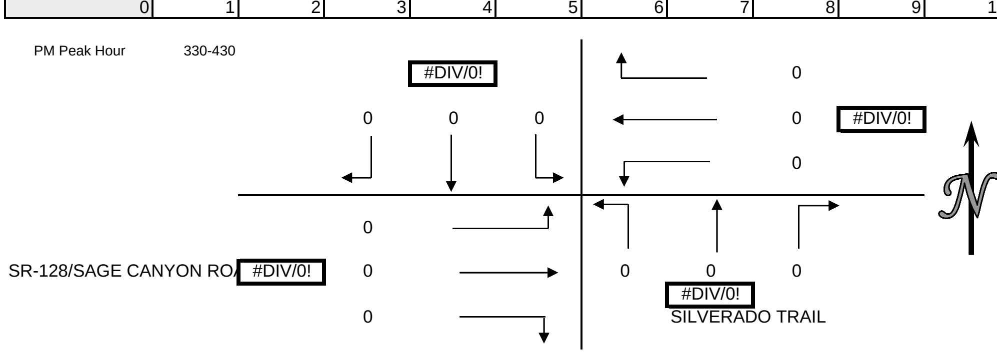
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	1	0	0	0	0	0	0	1	1
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	1	0	0	0	0	0	0	1	1
345-445	1	0	0	0	0	0	0	1	1
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



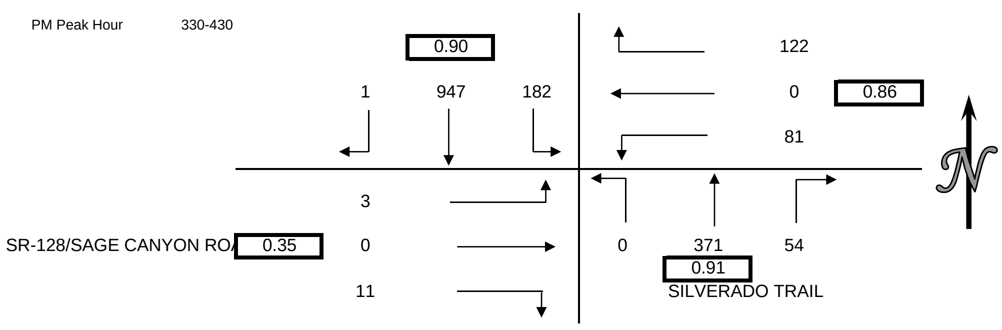
WILTEC Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		WEDNESDAY MAY 22, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SR-128/SAGE CANYON ROAD
CITY:		NAPA COUNTY

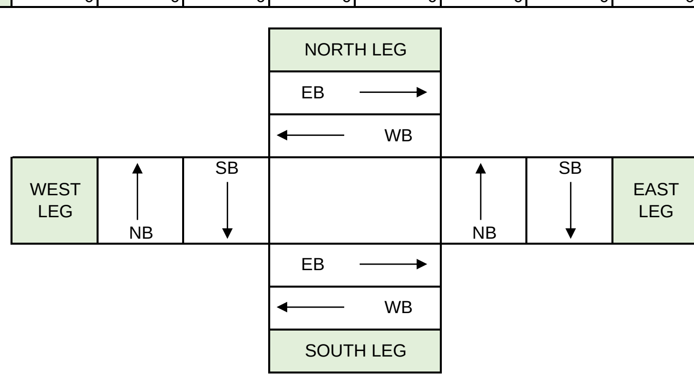
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	1	248	30	19	0	21	15	102	0	8	0	2	446
345-400	0	264	49	23	0	26	14	75	0	0	0	0	451
400-415	0	260	50	38	0	17	14	95	0	2	0	0	476
415-430	0	175	53	42	0	17	11	99	0	1	0	1	399
430-445	0	165	47	26	0	17	25	82	0	0	0	0	362
445-500	1	135	50	13	0	10	17	83	0	0	0	1	310
500-515	0	132	36	16	0	9	13	82	0	0	0	0	288
515-530	0	135	23	12	0	12	7	91	0	0	0	0	280
530-545	0	167	36	9	0	6	13	85	0	1	0	0	317
545-600	1	140	29	8	0	2	9	57	0	0	0	1	247
600-615	0	126	11	8	0	5	4	49	0	0	0	0	203
615-630	0	106	11	5	0	4	3	47	0	0	0	0	176
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	1	947	182	122	0	81	54	371	0	11	0	3	1772
345-445	0	864	199	129	0	77	64	351	0	3	0	1	1688
400-500	1	735	200	119	0	61	67	359	0	3	0	2	1547
415-515	1	607	186	97	0	53	66	346	0	1	0	2	1359
430-530	1	567	156	67	0	48	62	338	0	0	0	1	1240
445-545	1	569	145	50	0	37	50	341	0	1	0	1	1195
500-600	1	574	124	45	0	29	42	315	0	1	0	1	1132
515-615	1	568	99	37	0	25	33	282	0	1	0	1	1047
530-630	1	539	87	30	0	17	29	238	0	1	0	1	943



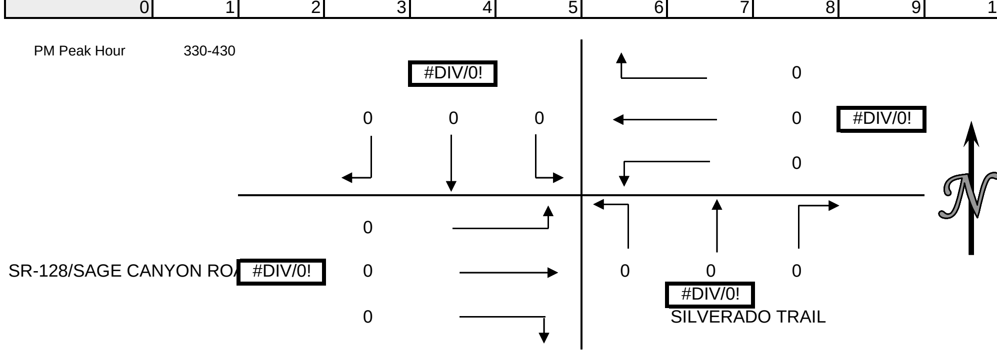
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

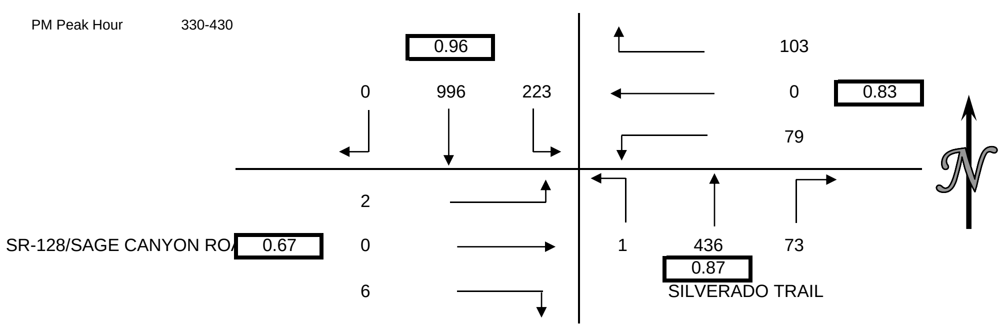
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		THURSDAY MAY 23, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SR-128/SAGE CANYON ROAD
CITY:		NAPA COUNTY

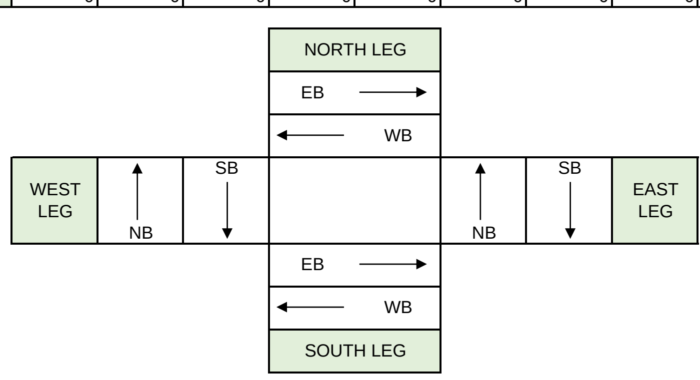
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	264	29	16	0	14	22	113	1	0	0	0	459
345-400	0	265	52	18	0	28	12	95	0	2	0	1	473
400-415	0	240	69	37	0	14	11	109	0	1	0	1	482
415-430	0	227	73	32	0	23	28	119	0	3	0	0	505
430-445	0	173	85	32	0	10	22	122	0	1	0	0	445
445-500	0	154	45	23	0	11	16	105	0	1	0	0	355
500-515	1	149	24	26	0	11	12	110	0	1	0	0	334
515-530	0	144	33	12	0	10	14	102	0	0	0	0	315
530-545	0	169	32	11	0	8	12	83	0	0	0	0	315
545-600	0	155	26	10	0	6	6	73	0	4	0	0	280
600-615	0	128	18	6	0	3	5	53	0	0	0	0	213
615-630	0	103	15	6	0	7	4	52	0	0	0	0	187
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	996	223	103	0	79	73	436	1	6	0	2	1919
345-445	0	905	279	119	0	75	73	445	0	7	0	2	1905
400-500	0	794	272	124	0	58	77	455	0	6	0	1	1787
415-515	1	703	227	113	0	55	78	456	0	6	0	0	1639
430-530	1	620	187	93	0	42	64	439	0	3	0	0	1449
445-545	1	616	134	72	0	40	54	400	0	2	0	0	1319
500-600	1	617	115	59	0	35	44	368	0	5	0	0	1244
515-615	0	596	109	39	0	27	37	311	0	4	0	0	1123
530-630	0	555	91	33	0	24	27	261	0	4	0	0	995



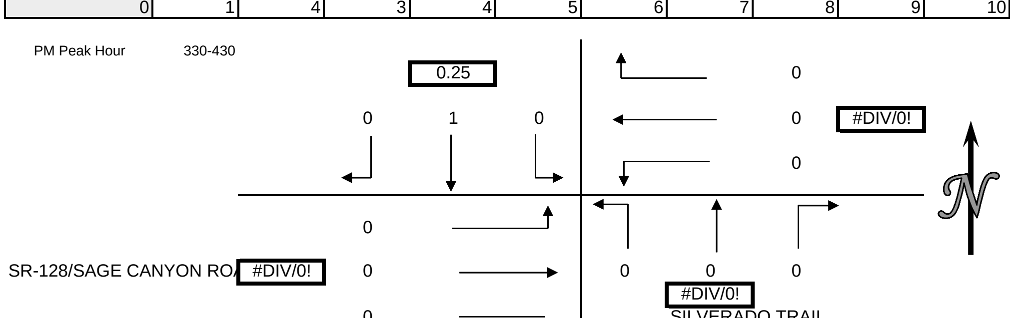
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	1	0	0	0	0	0	0	0	0	0	0	1
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	2	0	0	0	0	0	0	0	0	0	0	2
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1	0	0	0	0	0	0	0	0	0	0	1
345-445	0	1	0	0	0	0	0	0	0	0	0	0	1
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	2	0	0	0	0	0	0	0	0	0	0	2
0	1	4	3	4	5	6	7	8	9	10	11	12	80



WILTEC

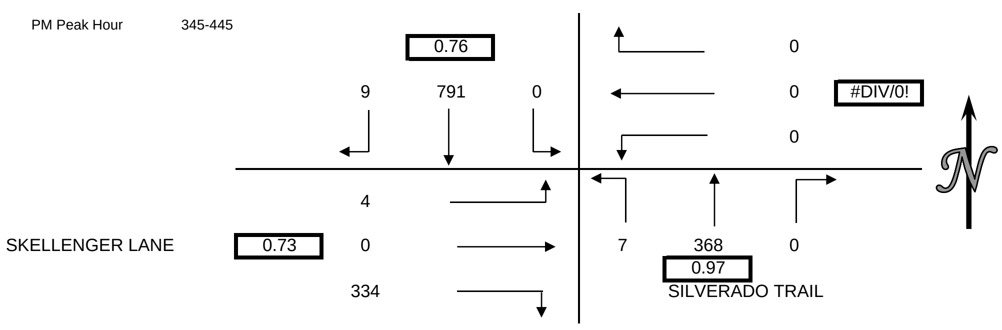
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		TUESDAY MAY 21, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SKELLENGER LANE
CITY:		NAPA COUNTY

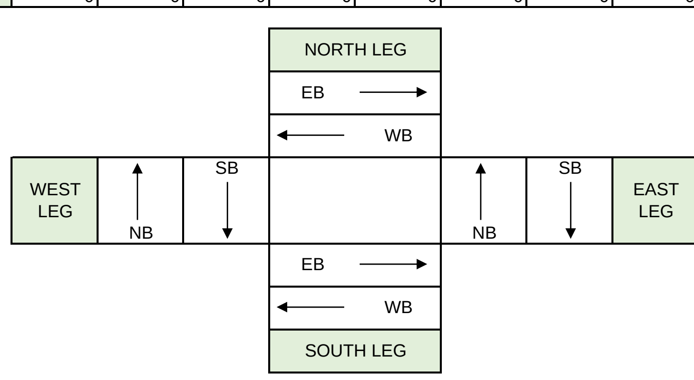
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	1	230	0	0	0	0	0	100	1	26	0	0	358
345-400	3	259	0	0	0	0	0	90	2	28	0	0	382
400-415	4	183	0	0	0	0	0	95	2	85	0	4	373
415-430	1	171	0	0	0	0	0	94	2	115	0	0	383
430-445	1	178	0	0	0	0	0	89	1	106	0	0	375
445-500	1	178	0	0	0	0	0	89	2	95	0	0	365
500-515	3	186	0	0	0	0	0	57	4	86	0	0	336
515-530	4	177	0	0	0	0	0	85	1	89	0	1	357
530-545	0	210	0	0	0	0	0	78	0	33	0	1	322
545-600	0	182	0	0	0	0	0	56	2	31	0	0	271
600-615	0	106	0	0	0	0	0	40	3	5	0	0	154
615-630	0	87	0	0	0	0	0	49	0	4	0	1	141
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	9	843	0	0	0	0	0	379	7	254	0	4	1496
345-445	9	791	0	0	0	0	0	368	7	334	0	4	1513
400-500	7	710	0	0	0	0	0	367	7	401	0	4	1496
415-515	6	713	0	0	0	0	0	329	9	402	0	0	1459
430-530	9	719	0	0	0	0	0	320	8	376	0	1	1433
445-545	8	751	0	0	0	0	0	309	7	303	0	2	1380
500-600	7	755	0	0	0	0	0	276	7	239	0	2	1286
515-615	4	675	0	0	0	0	0	259	6	158	0	2	1104
530-630	0	585	0	0	0	0	0	223	5	73	0	2	888



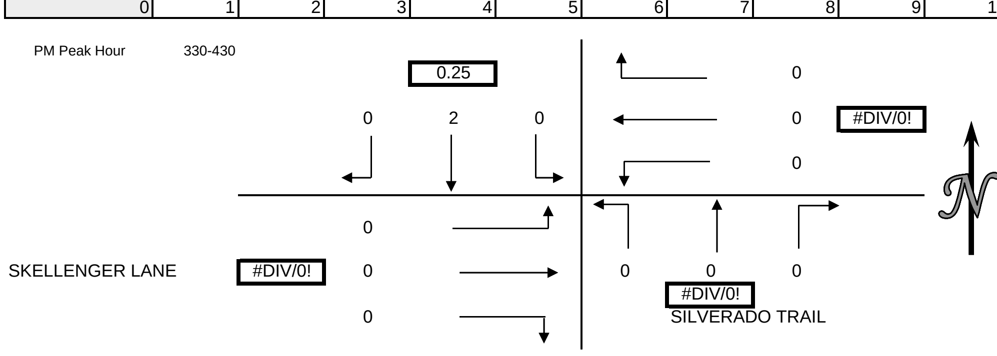
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	2	0	0	0	0	0	0	0	0	0	0	2
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	2	0	0	0	0	0	0	0	0	0	0	2
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



WILTEC

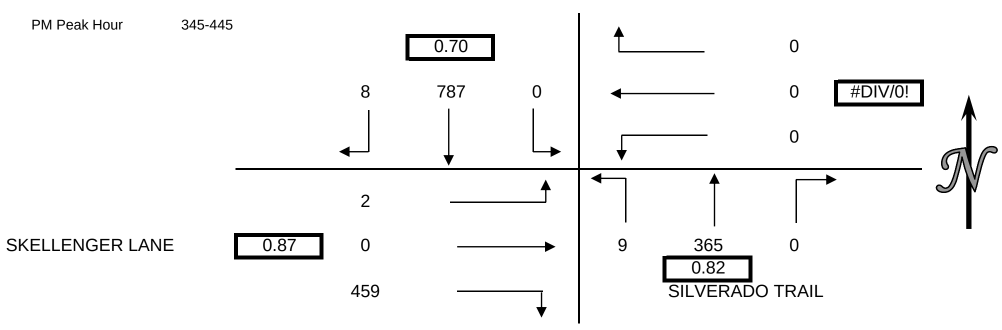
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY-HORN
PROJECT:		NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE:		WEDNESDAY MAY 22, 2019
PERIOD"		3:30 PM TO 6:30 PM
INTERSECTION:	N/S	SILVERADO TRAIL
	E/W	SKELLENGER LANE
CITY:		NAPA COUNTY

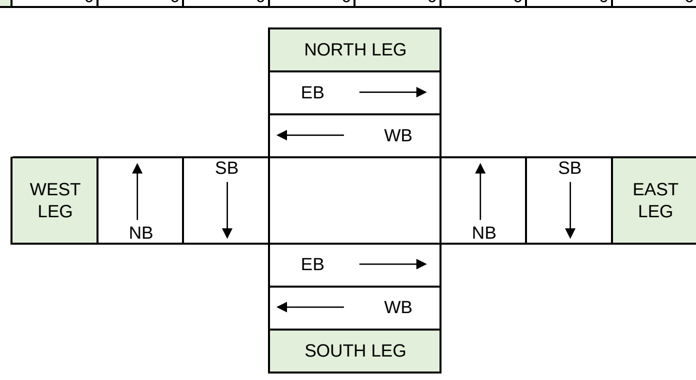
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	1	240	0	0	0	0	0	115	0	3	0	2	361
345-400	1	282	0	0	0	0	0	93	3	91	0	0	470
400-415	0	168	0	0	0	0	0	111	3	114	0	1	397
415-430	5	175	0	0	0	0	0	84	2	122	0	1	389
430-445	2	162	0	0	0	0	0	77	1	132	0	0	374
445-500	1	168	0	0	0	0	0	95	2	141	0	0	407
500-515	4	134	0	0	0	0	0	92	3	109	0	0	342
515-530	2	161	0	0	0	0	0	99	3	133	0	4	402
530-545	4	226	0	0	0	0	0	85	1	70	0	1	387
545-600	3	218	0	0	0	0	0	65	1	47	0	0	334
600-615	0	106	0	0	0	0	0	56	0	17	0	0	179
615-630	1	113	0	0	0	0	0	50	0	19	0	0	183
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	7	865	0	0	0	0	0	403	8	330	0	4	1617
345-445	8	787	0	0	0	0	0	365	9	459	0	2	1630
400-500	8	673	0	0	0	0	0	367	8	509	0	2	1567
415-515	12	639	0	0	0	0	0	348	8	504	0	1	1512
430-530	9	625	0	0	0	0	0	363	9	515	0	4	1525
445-545	11	689	0	0	0	0	0	371	9	453	0	5	1538
500-600	13	739	0	0	0	0	0	341	8	359	0	5	1465
515-615	9	711	0	0	0	0	0	305	5	267	0	5	1302
530-630	8	663	0	0	0	0	0	256	2	153	0	1	1083



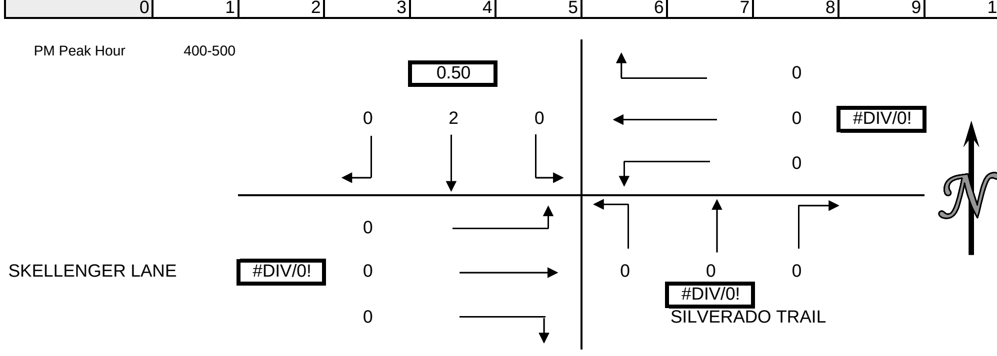
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	0	0	0	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	1	0	0	0	0	0	0	0	0	0	0	1
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	1	0	0	0	0	0	0	0	0	0	0	1
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	1	0	0	0	0	0	0	0	0	0	0	1
345-445	0	1	0	0	0	0	0	0	0	0	0	0	1
400-500	0	2	0	0	0	0	0	0	0	0	0	0	2
415-515	0	1	0	0	0	0	0	0	0	0	0	0	1
430-530	0	1	0	0	0	0	0	0	0	0	0	0	1
445-545	0	1	0	0	0	0	0	0	0	0	0	0	1
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



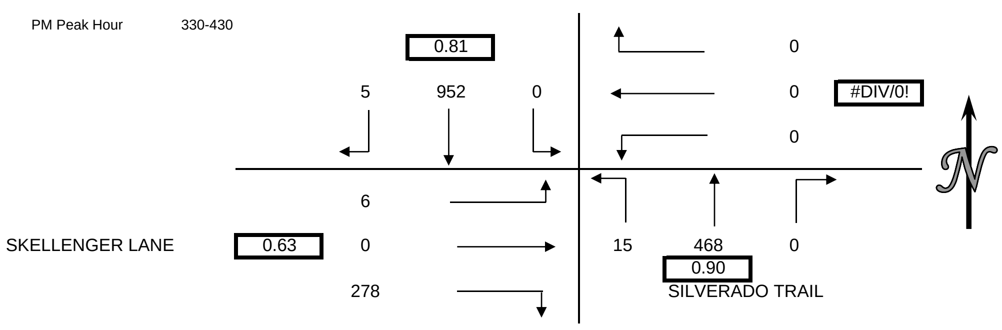
WILTEC
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT: KIMLEY-HORN
PROJECT: NAPA SR-29 AND SILVERADO TRAIL IMPROVEMENTS PROJECT
DATE: THURSDAY MAY 23, 2019
PERIOD" 3:30 PM TO 6:30 PM
INTERSECTION: N/S SILVERADO TRAIL
E/W SKELLENGER LANE
CITY: NAPA COUNTY

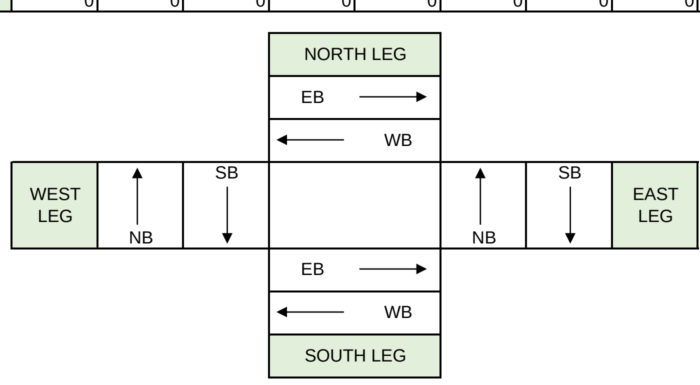
VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	1	274	0	0	0	0	0	115	4	34	0	4	432
345-400	1	296	0	0	0	0	0	110	5	28	0	0	440
400-415	1	242	0	0	0	0	0	112	3	111	0	2	471
415-430	2	140	0	0	0	0	0	131	3	105	0	0	381
430-445	3	178	0	0	0	0	0	113	0	111	0	0	405
445-500	1	169	0	0	0	0	0	88	2	130	0	2	392
500-515	4	172	0	0	0	0	0	101	1	117	0	0	395
515-530	9	195	0	0	0	0	0	119	3	83	0	0	409
530-545	1	219	0	0	0	0	0	64	4	60	0	0	348
545-600	2	213	0	0	0	0	0	68	4	54	0	1	342
600-615	0	134	0	0	0	0	0	52	1	13	0	1	201
615-630	2	106	0	0	0	0	0	49	0	10	0	0	167
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	5	952	0	0	0	0	0	468	15	278	0	6	1724
345-445	7	856	0	0	0	0	0	466	11	355	0	2	1697
400-500	7	729	0	0	0	0	0	444	8	457	0	4	1649
415-515	10	659	0	0	0	0	0	433	6	463	0	2	1573
430-530	17	714	0	0	0	0	0	421	6	441	0	2	1601
445-545	15	755	0	0	0	0	0	372	10	390	0	2	1544
500-600	16	799	0	0	0	0	0	352	12	314	0	1	1494
515-615	12	761	0	0	0	0	0	303	12	210	0	2	1300
530-630	5	672	0	0	0	0	0	233	9	137	0	2	1058



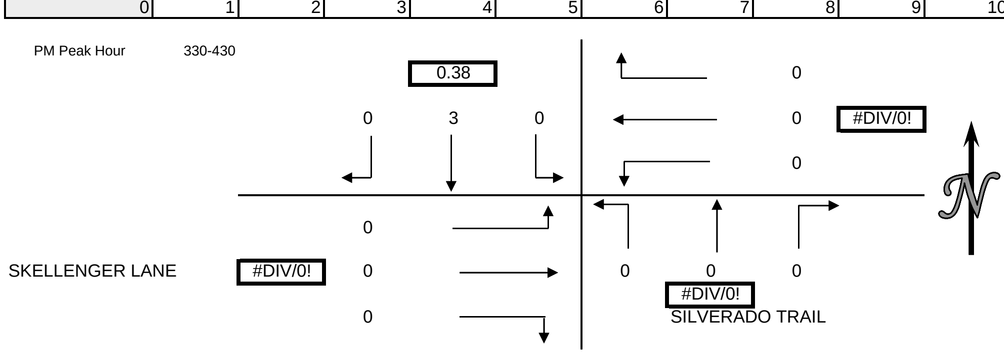
PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-345	0	0	0	0	0	0	0	0	0
345-400	0	0	0	0	0	0	0	0	0
400-415	0	0	0	0	0	0	0	0	0
415-430	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0
HOUR TOTALS	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG		TOTAL
PERIOD	EB	WB	NB	SB	EB	WB	NB	SB	
330-430	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0
400-500	0	0	0	0	0	0	0	0	0
415-515	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0



BICYCLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-345	0	2	0	0	0	0	0	0	0	0	0	0	2
345-400	0	0	0	0	0	0	0	0	0	0	0	0	0
400-415	0	1	0	0	0	0	0	0	0	0	0	0	1
415-430	0	0	0	0	0	0	0	0	0	0	0	0	0
430-445	0	0	0	0	0	0	0	0	0	0	0	0	0
445-500	0	0	0	0	0	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0	0	0	0	0	0
515-530	0	0	0	0	0	0	0	0	0	0	0	0	0
530-545	0	0	0	0	0	0	0	0	0	0	0	0	0
545-600	0	0	0	0	0	0	0	0	0	0	0	0	0
600-615	0	0	0	0	0	0	0	0	0	0	0	0	0
615-630	0	0	0	0	0	0	0	0	0	0	0	0	0
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
330-430	0	3	0	0	0	0	0	0	0	0	0	0	3
345-445	0	1	0	0	0	0	0	0	0	0	0	0	1
400-500	0	1	0	0	0	0	0	0	0	0	0	0	1
415-515	0	0	0	0	0	0	0	0	0	0	0	0	0
430-530	0	0	0	0	0	0	0	0	0	0	0	0	0
445-545	0	0	0	0	0	0	0	0	0	0	0	0	0
500-600	0	0	0	0	0	0	0	0	0	0	0	0	0
515-615	0	0	0	0	0	0	0	0	0	0	0	0	0
530-630	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9	10	11	12	78



Appendix B: SimTraffic Outputs

1: SR-29 & Inglenook/Rutherford Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.4	1.0	0.0	0.2	0.6	1037.2	945.8	934.0	471.7
Total Del/Veh (s)	128.8	384.5	36.2	878.7	867.0	8.5	13.9	9.9	136.7	138.3	119.5	163.1

2: SR-29 & Robert Mondavi Winery Drivway Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.3	0.3	0.3	0.0	7.6	71.0	3.4
Total Del/Veh (s)	23.3	10.7	2.9	1.5	296.1	294.2	125.4

3: SR-29 & Oakville Grocery Driveway Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.2	0.0	0.1	0.0
Total Del/Veh (s)	14.1	8.3	2.4	0.6	3.9	0.8	1.8

4: SR-29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.1	0.4	0.1	4.1	6.7	3.6	3.8	0.0	0.0	0.0
Total Del/Veh (s)	17.5	17.0	5.2	42.9	10.5	10.3	9.7	7.6	4.6	3.1	1.4	0.0

4: SR-29 & Walnut Lane/Oakville Cross Road Performance by movement

Movement	All
Denied Del/Veh (s)	2.0
Total Del/Veh (s)	7.4

5: Silverado Trail & Conn Creek Road Performance by movement

Movement	EBL	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.7	4.2	0.1	0.2	0.0	0.0	0.0	1318.0	1022.7	1039.3	737.5
Total Del/Veh (s)	73.3	40.6	103.6	13.4	30.8	3.1	2.3	68.8	72.3	65.1	48.2

6: Silverado Trail & Sage Cayon Road Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	4.2	0.9	3.7	0.0	0.2	0.0	0.0	0.0	0.0	0.4
Total Del/Veh (s)	5.7	8.2	30.3	11.5	9.4	8.3	5.0	6.9	6.0	2.5	8.6

7: Silverado Trail & Skellenger Lane Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.9	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	15.4	37.3	2.6	0.5	57.0	47.2	32.8

22: Silverado Trail Performance by movement

Movement	SET	NWT	All
Denied Del/Veh (s)	3.2	0.0	2.1
Total Del/Veh (s)	30.0	0.6	20.0

29: Silverado Trail Performance by movement

Movement	SET	NWT	All
Denied Del/Veh (s)	0.0	1.3	0.5
Total Del/Veh (s)	5.8	1.1	4.2

31: SR-29 Performance by movement

Movement	SET	NWT	All
Denied Del/Veh (s)	74.9	0.0	30.3
Total Del/Veh (s)	148.8	0.9	61.1

33: SR-29 Performance by movement

Movement	SET	NWT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	10.2	1.8	5.1

35: SR-29 Performance by movement

Movement	SET	NWT	All
Denied Del/Veh (s)	64.6	0.0	26.7
Total Del/Veh (s)	253.2	1.2	106.3

37: SR-29 Performance by movement

Movement	SET	NWT	All
Denied Del/Veh (s)	0.0	0.1	0.1
Total Del/Veh (s)	7.2	9.3	8.5

Total Network Performance

Denied Del/Veh (s)	515.6
Total Del/Veh (s)	325.2

Arterial Level of Service: NW SR-29

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Oakville Cross Road	4	7.6	26.4	0.2	34
Oakville Grocery Dri	3	2.5	7.0	0.1	33
	33	1.8	10.0	0.1	40
	31	0.9	10.1	0.1	45
Robert Mondavi Winer	2	1.5	11.9	0.1	45
	37	9.3	83.3	1.1	46
	35	1.2	6.5	0.1	40
Rutherford Road	1	13.9	33.7	0.3	30
Total		38.8	188.9	2.1	40

Arterial Level of Service: SB SR-29

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Inglenook	1	138.3	2077.8	0.2	5
	35	242.3	338.2	0.3	4
	37	7.2	33.7	0.1	8
Robert Mondavi Winer	2	296.1	376.4	1.1	10
	31	148.5	236.7	0.1	3
	33	10.2	55.6	0.1	8
Oakville Grocery Dri	3	0.8	13.8	0.1	29
Walnut Lane	4	1.4	5.9	0.1	39
Total		844.7	3138.2	2.1	7

Arterial Level of Service: NW Silverado Trail

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	29	1.1	8.3	0.1	47
	22	0.6	8.5	0.1	51
Skellenger Lane	7	0.5	9.0	0.1	53
	25	0.6	11.4	0.2	52
	27	4.6	65.1	0.9	51
	24	2.7	30.1	0.4	50
	26	0.9	9.6	0.1	49
Sage Cayon Road	6	8.3	45.5	0.6	46
	5	3.6	9.7	0.1	34
Total		23.0	197.4	2.6	49

Arterial Level of Service: SE Silverado Trail

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Conn Creek Road	5	72.3	1948.8	0.3	11
	6	6.4	12.5	0.1	26
	26	17.4	55.3	0.6	38
	24	19.4	28.0	0.1	17
	27	132.0	158.2	0.4	10
	25	631.8	682.4	0.9	5
Skellenger Lane	7	57.0	67.2	0.2	9
	22	30.8	44.8	0.1	12
	29	5.8	48.7	0.1	9
Total		972.9	3045.9	2.8	9

Intersection: 1: SR-29 & Inglenook/Rutherford Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	LTR	L	TR
Maximum Queue (ft)	74	1564	66	30	170	1196
Average Queue (ft)	24	1089	31	8	57	570
95th Queue (ft)	59	1680	72	27	175	1415
Link Distance (ft)	1116	2209		1430		1195
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)			25		145	
Storage Blk Time (%)		95	21		0	36
Queuing Penalty (veh)		59	20		0	27

Intersection: 2: SR-29 & Robert Mondavi Winery Drivway

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	118	30	2985
Average Queue (ft)	25	5	1468
95th Queue (ft)	67	22	2991
Link Distance (ft)	330		5559
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SR-29 & Oakville Grocery Driveway

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	50	31
Average Queue (ft)	8	2
95th Queue (ft)	32	15
Link Distance (ft)	81	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SR-29 & Walnut Lane/Oakville Cross Road

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	TR	L
Maximum Queue (ft)	53	182	55	23	41	25
Average Queue (ft)	26	55	27	1	5	9
95th Queue (ft)	48	125	50	8	22	27
Link Distance (ft)	634	860			1110	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			240	145		100
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Silverado Trail & Conn Creek Road

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	173	50	64	120	39	23	76
Average Queue (ft)	55	39	17	44	1	1	33
95th Queue (ft)	126	64	46	95	13	8	71
Link Distance (ft)	738		353		402		1378
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		25		110		70	
Storage Blk Time (%)	50	35		2			1
Queuing Penalty (veh)	31	15		6			0

Intersection: 6: Silverado Trail & Sage Cayon Road

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	LT	R	LT	R	L	TR	L
Maximum Queue (ft)	29	37	198	50	21	11	56
Average Queue (ft)	1	11	65	43	1	1	23
95th Queue (ft)	10	38	137	56	7	6	45
Link Distance (ft)	143		1275			3018	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		25		25	110		170
Storage Blk Time (%)	0	2	35	11			
Queuing Penalty (veh)	0	0	43	9			

Intersection: 7: Silverado Trail & Skellenger Lane

Movement	EB	EB	NB	SB	B25	B27	B24	B26
Directions Served	L	R	L	TR	T	T	T	T
Maximum Queue (ft)	350	67	28	80	4866	2200	56	56
Average Queue (ft)	139	51	5	50	3782	667	12	8
95th Queue (ft)	304	57	21	71	5909	1916	50	40
Link Distance (ft)	2426			802	4775	2149	639	3018
Upstream Blk Time (%)					29	1		
Queuing Penalty (veh)					291	12		
Storage Bay Dist (ft)		25	70					
Storage Blk Time (%)	1	76						
Queuing Penalty (veh)	3	3						

Intersection: 22: Silverado Trail

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 29: Silverado Trail

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 31: SR-29

Movement	SE
Directions Served	T
Maximum Queue (ft)	740
Average Queue (ft)	693
95th Queue (ft)	717
Link Distance (ft)	740
Upstream Blk Time (%)	0
Queuing Penalty (veh)	1
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 33: SR-29

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 35: SR-29

Movement	SE
Directions Served	T
Maximum Queue (ft)	1419
Average Queue (ft)	1331
95th Queue (ft)	1468
Link Distance (ft)	1430
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 37: SR-29

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 521

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