TRAFFIC IMPACT STUDY

FOR

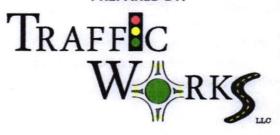
HIGH SCHOOL AT WILDCREEK

January 31, 2019

PREPARED FOR:

Washoe County School District

PREPARED BY:





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COMMUNITY SERVICES ADMINISTRATION

EXECUTIVE SUMMARY

The proposed High School at Wildcreek site is located north of North McCarran Boulevard and east of Sullivan Lane at the existing Wildcreek Golf Course property. The proposed high school would serve 2,125 students and 150 employees/staff. The anticipated future zoning boundary would generally include the current Hug High School zoning district and all of Sun Valley.

The proposed project would generate approximately 4,314 Daily, 1,105 AM peak hour, 701 Afternoon peak hour, and 298 PM peak hour trips. The High School at Wildcreek is anticipated to be a closed campus with students staying on-site during their breaks. Access to the project site would be provided via two new roundabout intersections on Sullivan Lane. **Exhibit 1** on page 12 shows the proposed roundabout lane configurations.

Under Existing Plus Project conditions and 2040 Plus Project conditions, the El Rancho Drive/Sullivan Lane and McCarran Boulevard/Sullivan Lane intersections would operate at LOS F. Additionally, the El Rancho Drive/Sun Valley Boulevard intersection is expected to have a volume-to-capacity ratio greater than 1.0 indicating a need for capacity improvements.

The following intersection improvements would mitigate and improve operations to acceptable levels:

- El Rancho Drive/Sun Valley Boulevard
 - Convert the existing westbound to northbound right-turn lane to a free right-turn lane with acceleration lane and merge taper
 - o Optimize signal timing

Based on NDOT's Access Management System and Standards, 2017 Edition, an acceleration lane with 280 feet of acceleration length followed by at least 144 feet of taper length should be constructed. Consideration should be given during final design to adjusting these lengths to either intentionally include or exclude the northerly apartment complex driveway within the acceleration lane.

- El Rancho Drive/Sullivan Lane
 - Construct a roundabout at the intersection with a shared through/right-turn lane on the northbound approach, a left-turn lane and a right-turn pocket on the westbound approach, and a left-turn lane and shared through/left-turn lane on the southbound approach (see Exhibit 2 on page 16)
- McCarran Boulevard/Sullivan Lane (see Figure 12)
 - Modify northbound lane configurations to include one left-turn lane and a shared through/right-turn lane
 - Modify southbound lane configurations to include two left-turn lanes, one through lane, and one right-turn lane
 - Change northbound and southbound signal phasing to protected left-turns



- Extend the eastbound left-turn pocket to include 600 feet of striped pocket plus 170 feet of deceleration length plus 180 feet of taper, to provide a conservative length for peak queue storage
- Optimize signal timing
- McCarran Boulevard/El Rancho Drive
 - Optimize signal timing in coordination with the McCarran Boulevard/Sullivan Lane intersection

Additionally, the following multimodal improvements are recommended (see Figure 5):

- Sullivan Lane: Construct sidewalks and bicycle lanes along the project frontage
- East side of Sullivan Lane between Wedekind Road and El Rancho Drive, east side of El Rancho
 Drive north of Sullivan Lane, and on the north side of McCarran Boulevard west of Sullivan Lane:
 Construct sidewalk at select locations to fill in gaps in the existing walking infrastructure
- Public Transit: Based on RTC direction, potentially construct an RTC RIDE transit stop on Sullivan Lane near the campus entrance. The RTC may wish to consider changes to Route 15 to better serve high school students and staff
- Implement a 15 mph "school zone" on Sullivan Lane during the morning arrival and afternoon dismissal peak travel periods (specific times to be based on the actual school hours schedule)



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INTRODUCTION

This Traffic Impact Study evaluates the potential traffic impacts associated with the proposed High School at Wildcreek in Sparks, Nevada. This study of potential transportation impacts was undertaken for planning purposes and to determine what traffic controls or other mitigations are needed to manage the project traffic.

Project Description

The proposed high school site is located north of North McCarran Boulevard and east of Sullivan Lane at the existing Wildcreek Golf Course property as shown on **Figure 1**. The proposed high school would serve 2,125 students who generally reside in the current Hug High School zoning district and throughout all of Sun Valley. The area of traffic contribution is shown on **Figure 2**. The high school would have approximately 150 employees/staff. The proposed project would include all typical features of a high school including a stadium, athletic facilities, and large parking areas. The project site plan is shown on **Figure 3**.

Study Area and Evaluated Scenarios

The following intersections and roadway segments (shown on **Figure 1**) are included in the analysis based on scoping discussions with the City of Sparks and the anticipated future school zoning boundaries:

Intersections

- El Rancho Drive / Sun Valley Boulevard
- El Rancho Drive / Sullivan Lane
- Sullivan Lane / North Project Access plus project conditions
- Sullivan Lane / Niblick Drive
- Sullivan Lane / South Project Access plus project conditions
- Sullivan Lane / Green Vista Drive
- McCarran Boulevard / El Rancho Drive
- McCarran Boulevard / Sullivan Lane

Roadway Segments

- North McCarran Boulevard between El Rancho Drive and Sullivan Lane
- El Rancho Drive between Sun Valley Boulevard and Sullivan Lane
- Sullivan Lane between El Rancho Drive and McCarran Boulevard

This study includes analysis of the weekday AM, Afternoon (when school is dismissed), and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The evaluated development scenarios are:



- Existing Conditions (no project)
- Existing Plus Project Conditions
- 2040 Background Conditions (no project)
- 2040 Plus Project Conditions

The 2040 Background conditions scenario reflects the 2040 horizon year which is consistent with the latest version of the Regional Transportation Commission's (RTC) 2040 Regional Transportation Plan (2040 RTP).

ANALYSIS METHODOLOGY

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades "A" through "F" with "A" representing optimum conditions and "F" representing breakdown or over capacity flows.

Intersections

The complete methodology for intersection level of service analysis is established in the *Highway Capacity Manual (HCM) 2010*, published by the Transportation Research Board (TRB). Due to some operational limitations in the *HCM 2010*, the methodology established in the *Highway Capacity Manual 2000* was also used. **Table 1** presents the delay thresholds for each level of service grade at signalized and unsignalized intersections.

Table 1: Level of Service Definition for Intersections

Level of	Free flow conditions. Stable conditions with some affect from other vehicle Stable conditions with significant affect from other vehicles. High density traffic conditions still with stable flow. At or near capacity flows.		e Delay er vehicle)
Service	Brief Description	Signalized Intersections	Unsignalized Intersections
Α	Free flow conditions.	< 10	< 10
В	Stable conditions with some affect from other vehicles.	10 to 20	10 to 15
С	10 Procedures and the contract and the c	20 to 35	15 to 25
D	High density traffic conditions still with stable flow.	35 to 55	25 to 35
Е	At or near capacity flows.	55 to 80	35 to 50
F	Over capacity conditions.	> 80	> 50

Source: Highway Capacity Manual (2010), Chapters 18 through 21

Level of service calculations were performed for the signalized, side street stop, and all way stop controlled study intersections using the Synchro 9 software package with analysis and results reported in accordance with *HCM 2000* and *HCM 2010* methodology. Roundabout intersections were analyzed using SIDRA software with results also reported in accordance with the current *HCM 2010* methodology.



Roadway Segments

Table 2 shows daily roadway segment level of service thresholds based on roadway facility type and number of lanes. Daily roadway segment level of service is determined by comparing daily traffic volumes to thresholds presented in the table.

Table 2: Average Daily Traffic LOS Thresholds by Facility Type

Facility Type		Maximum Service F	low Rate (Daily for	Given Service Leve	1)
# of Lanes	LOS A	LOS B	LOS C	LOS D	LOSE
		Arterial – High	Access Control		
2	n/a	9,400	17,300	19,200	20,300
4	n/a	20,400	36,100	38,400	40,600
6	n/a	31,600	54,700	57,600	60,900
8	n/a	42,500	73,200	76,800	81,300
		Arterial - Modera	te Access Control		
2	n/a	5,500	14,800	17,500	18,600
4	n/a	12,000	32,200	35,200	36,900
6	n/a	18,800	49,600	52,900	55,400
8	n/a	25,600	66,800	70,600	73,900
		Arterial - Low	Access Control		
2	n/a	n/a	6,900	13,400	15,100
4	n/a	n/a	15,700	28,400	30,200
6	n/a	n/a	24,800	43,100	45,400
8	n/a	n/a	34,000	57,600	60,600

Source: Washoe County 2035 RTP, Table 3-4

Level of Service Policy

The 2040 Regional Transportation Plan establishes level of service criteria for regional roadway facilities in the City of Reno, City of Sparks, and Washoe County. The current Level of Service policy is:

"All regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon – LOS D or better."

"All regional roadway facilities projected to carry 27,000 or more ADT at the latest RTP horizon – LOS E or better."

"All intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting corridors".

Where intersections are already experiencing level of service beyond the thresholds, conditions should not be exacerbated. In practice, this is commonly interpreted as not increasing average delay per vehicle by more than 5 seconds, or the volume-to-capacity ratio by more than 0.05 for roundabout intersections.



The following LOS thresholds were used for this study based on the above regional policies:

- El Rancho Drive / Sun Valley Boulevard LOS E
- El Rancho Drive / Sullivan Lane LOS D
- Sullivan Lane / North Project Access LOS D
- Sullivan Lane / Niblick Drive LOS D
- Sullivan Lane / South Project Access LOS D
- Sullivan Lane / Green Vista Drive LOS D
- McCarran Boulevard / El Rancho Drive LOS E
- McCarran Boulevard / Sullivan Lane LOS E

NDOT has agreed to defer to the LOS policy established by the 2040 RTP for the subject roadways and intersections within NDOT jurisdiction.

EXISTING CONDITIONS

Roadway Facilities

A brief description of the key roadways in the study area is provided below.

North McCarran Boulevard is a four-lane, High Access Control (HAC) Arterial roadway. McCarran Boulevard is a loop road that surrounds the Reno and Sparks metropolitan area. The posted speed limit on McCarran Boulevard near the project area is 45 mph. The segment of McCarran Blvd between El Rancho Drive and Rock Boulevard is programmed to be widened to six (6) lanes (three through lanes in each direction) in the 2027-2040 timeframe per the 2040 RTP.

Sullivan Lane is generally a north-south roadway that extends from El Rancho Drive in the north to Prater Way in the south. Near the project site, Sullivan Lane is a two-lane roadway with a posted speed limit of 35 mph north of McCarran Boulevard and 25 mph south of McCarran Boulevard. The 2040 RTP classifies Sullivan Lane as a Low Access Control (LAC) Arterial.

El Rancho Drive is generally a north-south roadway that extends from Sun Valley Boulevard in the north to Victorian Avenue in the south. El Rancho Drive is a four-lane roadway (two lanes in each direction) south of McCarran Boulevard, and a three-lane roadway (one lane in each direction with a two-way left-turn lane) north of McCarran Boulevard. Approximately 770 feet south/east of Sun Valley Boulevard, El Rancho Drive transitions back to a four-lane roadway as it approaches Sun Valley Boulevard. West of Sun Valley Boulevard, the roadway changes names to Dandini Boulevard and has one lane in each direction. The 2040 RTP classifies El Rancho Drive as a Moderate Access Control (MAC) Arterial. The posted speed limit near the project site is 35 mph.

Sun Valley Boulevard / Clear Acre Lane is generally a north-south five-lane roadway (two lanes in each direction with a two-way left-turn lane). North of El Rancho Drive the roadway is named Sun Valley Boulevard and south of El Rancho Drive it is named Clear Acre Lane. Sun Valley Boulevard and Clear Acre



Lane are both classified as MAC Arterials in the 2040 RTP. The posted speed limit on Sun Valley Boulevard north of El Rancho Drive is 35 mph. South of El Rancho Drive, the speed limit on Clear Acre Lane is 45 mph.

School Bus Service and Public Transit Facilities

The current Washoe County School District policy is to provide bus service for high school students outside a three (3) mile radius of the school. **Figure 4** shows a three-mile radius in relation to the proposed High School at Wildcreek site. A portion of the zoning district in the northern part of Sun Valley would be eligible for bus service.

Figure 4 also shows the RTC RIDE fixed transit routes within the vicinity of the proposed school site.

Route 5 provides service from 4th Street Station to Sun Valley and travels along Sutro Street, Clear Acre Lane, and Sun Valley Boulevard. Route 5 includes two Snow Route detours moving service from Selmi Drive and Clear Acre Lane to McCarran Boulevard and El Rancho Drive during inclement weather. The second Snow Route detour moves service from 8th Avenue to 7th Avenue in Sun Valley. Service is provided Monday through Friday on 30 minute to one hour headways from 5:00 AM to approximately 1:00 AM. Weekend and holiday service is provided from 5:15 AM to approximately 1:00 AM on one hour headways.

Route 15 is closest to the Wildcreek site as it traverses through the El Rancho Drive/Sullivan Lane intersection just north of the site. It provides service between 4th Street Station and Truckee Meadows Community College (TMCC) and travels along Sutro Street, Wedekind Road, El Rancho Drive, and Dandini Boulevard. Service is provided on 30 minute to one hour headways from 5:45 AM to approximately 11:30 PM Monday through Friday. Weekend and holiday service is provided on one hour headways, with Saturday service from 5:45 AM to approximately 11:30 PM, and Sunday and holiday service from approximately 5:45 AM to approximately 10:30 PM.

The Wildcreek site is generally served by public transit (Routes 5 and 15). Transit service for the high school could be significantly improved by moving Route 15 to Sullivan Lane instead of El Rancho Drive. Such a decision would have to be made by the Regional Transportation Commission based on overall ridership demand and other factors.

Bicycle and Pedestrian Facilities

Bicycle and pedestrian facilities including bicycle lanes and sidewalks partially exist within the project vicinity. **Figure 5** shows the existing bicycle and pedestrian facilities network near the project site.

Bicycle lanes exist on McCarran Boulevard, El Rancho Drive, and Clear Acre Lane, and on Sun Valley Boulevard between 2nd Avenue and 7th Avenue. There are currently no bicycle lanes on Sullivan Lane or on Sun Valley Boulevard between El Rancho Drive and 2nd Avenue.

Sidewalk facilities in the project area also have gaps. There are no sidewalks along the north side of McCarran Boulevard west of Sullivan Lane to Rock Boulevard. The south side of McCarran Boulevard has an asphalt walking path from Sullivan Lane to Wedekind Road. Sullivan Lane has sidewalk along its west



side from McCarran Boulevard to El Rancho Drive. Sidewalks exist on both sides of El Rancho Drive from McCarran Boulevard to Wildcreek Drive, and along the west side from Wildcreek Drive to Sullivan Lane and from Maynard Way to Sun Valley Boulevard. Clear Acre Lane and Sun Valley Boulevard have short sections of noncontiguous sidewalk throughout most of their lengths.

Existing Intersection Level of Service

Existing conditions intersection level of service analysis was performed using Synchro 9 analysis software, with reporting for unsignalized intersections based on *HCM 2010* methodology and reporting for signalized intersections based on *HCM 2000* methodology. *HCM 2010* does not enable analysis of signalized intersections with shared through/turn lanes and exclusive turn lanes on the same approach (as currently seen at the McCarran Boulevard/Sullivan Lane intersection). For consistency between analysis scenarios, *HCM 2000* reporting was used for all signalized intersections throughout this report.

The existing peak hour factors from the traffic counts were used in the analysis. A default heavy vehicle percentage of two percent was also used. The existing intersection lane configurations and traffic controls are shown on **Figure 6** and the existing traffic volumes are shown on **Figure 7**. **Table 3** shows the existing conditions intersection level of service results. The technical calculations are provided in **Appendix A**.

Table 3: Existing Conditions Intersection Level of Service Results

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Intersection	Control	LOS	Delay ² (sec)	LOS	Delay ² (sec)	LOS	Delay ² (sec)
El Rancho Dr / Sun Valley Blvd	Signal	С	26.0	С	24.4	С	32.2
El Rancho Dr / Sullivan Ln	Cida Charat						NET BAR
Westbound Approach	Side-Street	В	11.4	С	15.7	D	27.3
Southbound Left	Stop	Α	8.6	Α	8.9	Α	9.8
Sullivan Ln / Niblick Dr	Side Steed						
Eastbound Approach	Side-Street	В	13.2	В	10.3	В	12.3
Northbound Left	Stop	Α	8.4	Α	8.0	Α	8.3
Sullivan Ln / Green Vista Dr							
Eastbound Approach		С	15.1	В	12.1	С	15.3
Westbound Approach	Side-Street	С	22.3	С	18.7	D	32.8
Northbound Left	Stop	Α	8.7	Α	8.1	Α	8.3
Southbound Left		Α	8.0	Α	7.9	Α	8.3
Ma Carrana Blad / El Barraha Br	Cianal	at the Section					
McCarran Blvd / El Rancho Dr	Signal	D	48.4	С	28.2	D	45.7
McCarran Blvd / Sullivan Ln	Signal	D	39.4	D	36.7	E	57.4

Notes:

^{3.} The LOS and delay results for the signalized intersections are based on HCM 2000 reporting because HCM 2010 does not support turning movement analysis with shared and exclusive lanes.



Source: Traffic Works, 2019

^{1.} The afternoon peak hour is the highest hour between 2:00 PM and 4:00 PM.

^{2.} Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and the worst approach/movement for unsignalized (side-street stop controlled) intersections.

As shown in **Table 3**, the study intersections currently operate at acceptable levels of service. It should be noted that the McCarran Boulevard/Sullivan Lane intersection currently functions at LOS E during the PM peak hour.

Existing Roadway Segment Level of Service

Three roadway segments were analyzed near the project site based on Annual Average Daily Traffic (AADT) volumes obtained from the Nevada Department of Transportation's (NDOT) Traffic Records Information Access (TRINA) online application. Level of service was determined by comparing the daily traffic volumes (shown on **Figure 7**) to the capacity thresholds provided in **Table 2**. **Table 4** shows the daily roadway segment volumes and corresponding levels of service for the study roadway segments.

Table 4: Existing Conditions Roadway Segment Level of Service Results

Roadway	Location	Classification ¹	# of Lanes	Volume ²	LOS	v/c Ratio
McCarran Blvd	El Rancho Dr to Sullivan Ln	HAC Arterial	4	29,000	С	0.71
El Rancho Dr	Sun Valley Blvd to Sullivan Ln	MAC Arterial	43	10,000	В	0.27
Sullivan Ln	El Rancho Dr to McCarran Blvd	LAC Arterial	2	5,600	С	0.37

Notes:

- 1. HAC = High Access Control; MAC = Moderate Access Control; LAC = Low Access Control
- 2. Based on 2017 AADT volumes from NDOT's Traffic Records Information Access (TRINA).
- 3. El Rancho Drive has four lanes near Sun Valley Blvd where traffic volume data was collected. East/south of Sun Valley Blvd,

El Rancho Drive has two lanes. Source: Traffic Works, 2019

As shown in the table, the study roadway segments currently operate at acceptable levels of service.

PROJECT CONDITIONS

Trip Generation

Trip generation rates from *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE) were used to develop trip generation estimates for the proposed high school based on 2,125 students and associated staff. **Table 5** shows the trip generation estimates for the AM, Afternoon (when school is dismissed), and PM peak hours.

Table 5: Trip Generation Estimates

Land Use					Trips1			
(ITE Code)	Size	Daily	AM	AM In/Out	Afternoon ²	Afternoon In/Out	PM	PM In/Out
High School (350)	2,125 students	4,314	1,105	740 / 365	701	224 / 477	298	143 / 155

Notes: 1. Trips were calculated based on the following rates per student: Daily -2.03; AM -0.52 (67% in / 33% out); Afternoon -0.33 (32% in / 68% out); PM -0.14 (48% in / 52% out)

2. The afternoon peak hour is between 2:00 PM and 4:00 PM.

Source: Traffic Works, 2019



As shown in the table, the proposed high school is expected to generate approximately 4,314 Daily, 1,105 AM peak hour, 701 Afternoon peak hour, and 298 PM peak hour trips. The High School at Wildcreek is anticipated to be a closed campus, meaning students are not permitted to leave or enter the campus during the middle of the day without permission (i.e. students may not leave campus for lunch, etc.).

The trip generation rates inherently consider the various travel modes to and from a high school including walking, bicycling, and bus ridership. Therefore, no trip rate reductions were applied for the use of alternate travel modes.

With this volume of traffic generated, the project would <u>not</u> be considered "regionally significant" based on traffic volumes.

Trip Distribution

The distribution of trips to the adjacent roadway network was determined based on the anticipated future school zoning (encompassing all of Sun Valley and the current Hug High School zone, as generally shown on **Figure 2**). Project trips are anticipated to be distributed as follows and shown on **Figure 8**:

- 45% to/from the north via Sun Valley Boulevard
- 5% to/from the northwest via Dandini Boulevard and Clear Acre Lane
- 30% to/from the west and south via El Rancho Drive and Sullivan Lane
- 15% to/from the west via N. McCarran Boulevard
- 5% to/from the east via N. McCarran Boulevard

The peak hour project trips at the study intersections are shown on Figure 9.

Peak Hour Factor

The peak hour factor (PHF) of an intersection is determined based on the following equation:

PHF = Total Peak Hour Volume / (Volume During the Peak 15 Minutes x 4)

In other words, the peak hour factor describes how traffic is dispersed throughout a peak hour. If traffic is dispersed evenly over the entire hour, the peak hour factor is higher (for example, if each 15 minute period of the peak hour has the same amount of traffic, the peak hour factor would be 1.0). Areas with higher fluctuations in traffic, for example near schools or businesses with a lot of employees that work the same shift times, may have lower peak hour factors because a large number of vehicles are arriving or leaving at the same time within a more condensed period of time. Traffic generated by a school is likely to lower the peak hour factor of nearby intersections which can negatively affect operations during the peak periods of activity. This analysis considers the worst 15 minutes.

The peak hour factors for each movement at the study intersections were calculated based on the existing peak hour factors of the existing traffic and assuming approximately 1/3 of students arrive during the 15 minutes before school starts and depart during the 15 minutes after school is dismissed with the other



2/3 also arriving within the peak hour. During the PM peak hour when project traffic primarily consists of faculty and students attending extra-curricular activities, the peak hour factors of the existing traffic were used at the study intersections.

Project Access

The project would include two access points on Sullivan Lane – one approximately 280 feet north of Niblick Drive (intersection #3 on Figure 1) and one approximately 760 feet north of Green Vista Drive (intersection #5 on Figure 1). Both access roads would connect to Sullivan Lane using roundabout intersections. An internal roadway network would provide access to the parking areas on the site, as shown on Figure 3.

The roundabout intersections at the project access locations should be configured as shown in **Exhibit 1** below to function properly with the proposed peak demands. As shown in the exhibit, the North Project Access roundabout would need two southbound lanes with one shared through/left-turn lane and one left-turn lane. The northbound and westbound legs would function as single lane approaches. The South Project Access roundabout would function adequately with a single lane on all approaches.

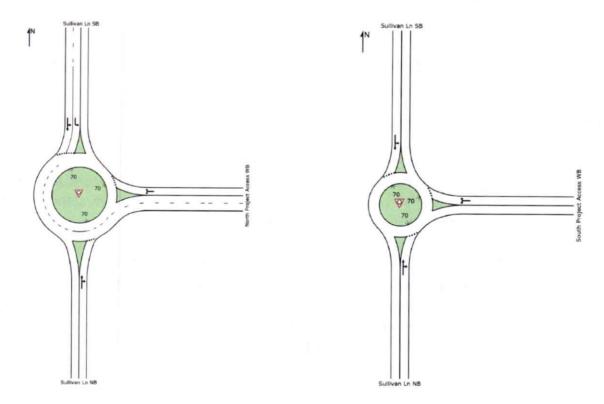


Exhibit 1: Proposed Roundabout Configurations – Project Access Locations



Multimodal Improvements

The Washoe County School District would construct the following multimodal improvements (shown on **Figure 5**) with the proposed project to serve students using alternative modes of travel:

- Sullivan Lane: Construct sidewalks and bicycle lanes along the project frontage
- East side of Sullivan Lane between Wedekind Road and El Rancho Drive, east side of El Rancho
 Drive north of Sullivan Lane, and on the north side of McCarran Boulevard west of Sullivan Lane:
 Construct sidewalk at select locations to fill in gaps in the existing walking infrastructure
- Public Transit: Based on RTC direction, potentially construct an RTC RIDE transit stop on Sullivan Lane near the campus entrance. The RTC may wish to consider changes to Route 15 to better serve high school students and staff
- Implement a 15 mph "school zone" on Sullivan Lane during the morning arrival and afternoon dismissal peak travel periods (specific times to be based on the actual school hours schedule)

EXISTING PLUS PROJECT CONDITIONS

Existing Plus Project Traffic Volumes

Project generated trips (Figure 9) were added to existing traffic volumes at the study intersections (Figure 7) to develop Existing Plus Project peak hour traffic volumes (shown on Figure 10).

Existing Plus Project Intersection Level of Service

Existing Plus Project intersection level of service analysis was performed using Synchro 9 software for the signalized and stop controlled intersections, with results reported based on *HCM 2000* and *HCM 2010* methodologies, respectively. The roundabout intersections were analyzed using SIDRA software with results reported based on *HCM 2010* methods. Peak hour factors for the AM and Afternoon peak hours (when students generate the majority of the project trips) were calculated assuming approximately 1/3 of students arrive during the 15 minutes before school starts and depart during the 15 minutes after school is dismissed. The existing intersection peak hour factors were used for the PM peak hour analysis. Existing Plus Project intersection lane configurations and controls are shown on **Figure 11**. **Table 6** shows the Existing Plus Project intersection level of service results for the AM, Afternoon, and PM peak hours. The technical calculations are provided in **Appendix B**.



Table 6: Existing Plus Project Intersection Level of Service Results

	C		AM		1	Afternoor	n ²	PM		
Intersection	Control ¹	LOS	Delay ³	V/C	LOS	Delay ³	V/C	LOS	Delay ³	V/C
El Rancho Dr/Sun Valley Blvd	Signal		NEW SE		4 815					
El Rancho Di/Sull Valley Bivu	Signal	С	28.4	NA	D	49.7	NA	D	47.8	NA
El Rancho Dr/Sullivan Ln	Side-		L CRESS			The last		10.00	e te Prod	
Westbound Approach	Street	F	>1,000	NA	F	705.0	NA	F	256.9	NA
Southbound Left	Stop	С	17.6	NA	В	10.0	NA	В	10.7	NA
Sullivan Ln/North Project Access			3000							
Northbound Approach] [С	16.4	0.67	Α	9.8	0.51	Α	9.0	0.48
Southbound Approach	RAB	В	11.5	0.68	Α	6.7	0.38	Α	7.3	0.42
Westbound Approach		В	10.0	0.38	В	13.6	0.52	Α	6.9	0.14
Sullivan Ln/Niblick Dr	Side-									
Eastbound Approach	Street	С	19.8	NA	В	11.4	NA	В	13.2	NA
Northbound Left	Stop	Α	9.3	NA	Α	8.4	NA	A	8.4	NA
Sullivan Ln/South Project Access										250
Northbound Approach		С	17.1	0.71	Α	8.1	0.42	Α	8.9	0.48
Southbound Approach	RAB	С	17.8	0.76	Α	9.5	0.48	Α	8.3	0.45
Westbound Approach		Α	8.5	0.30	Α	9.5	0.38	A	6.5	0.11
Sullivan Ln/Green Vista Dr									0.0	0.11
Eastbound Approach	Side-	С	22.9	NA	С	15.5	NA	С	16.8	NA
Westbound Approach	Street	E	42.0	NA	D	29.1	NA	E	39.7	NA
Northbound Left	Stop	Α	9.2	NA	Α	8.7	NA	A	8.4	NA
Southbound Left		Α	8.9	NA	Α	8.2	NA	A	8.4	NA
			E BERNEL						0.1	
McCarran Blvd/El Rancho Dr	Signal	E	55.7	NA	D	35.2	NA	D	45.6	NA
McCarran Blvd/Sullivan Ln4	Signal	F	93.1	NA	D	46.9	NA	E	60.8	NA

Notes: 1. RAB = roundabout

Bold indicates unacceptable operations.

Source: Traffic Works, 2019

As shown in the table, the El Rancho Drive/Sullivan Lane and McCarran Boulevard/Sullivan Lane intersections are expected to operate at LOS F during at least one of the study peak hours. Additionally, the El Rancho Drive/Sun Valley Boulevard intersection is expected to operate at LOS D, but with a volume-to-capacity ratio of 0.99 indicating a need for capacity improvement.

The westbound approach of the Sullivan Lane/Green Vista Drive intersection is expected to operate at LOS E with up to 42.0 seconds of delay (only 7 seconds more than the LOS E threshold). It should be noted that the proposed project would not add any traffic to the westbound approach of this intersection, only to the northbound and southbound approaches which are expected to operate at LOS A during all three peak hours. This condition (LOS E/F for a minor side street movement, with less than 60 seconds average delay in this case) commonly exists throughout urban and suburban areas and is a manageable situation



^{2.} The afternoon peak hour is the highest hour between 2:00 PM and 4:00 PM, when school gets out.

^{3.} Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and the worst approach/movement for unsignalized (side-street stop controlled) and roundabout intersections.

^{4.} The LOS and delay results for the McCarran Blvd/Sullivan Ln intersection are based on HCM 2000 reports because HCM 2010 does not support turning movement analysis with shared and exclusive lanes.

that does not justify a traffic signal, roundabout, or other major improvement that would disrupt traffic flow on Sullivan Lane (the major street). Additionally, the low side-street volumes (5 westbound vehicles during the AM peak hour and 35 vehicles during the PM peak hour, when LOS E conditions are expected to occur) do not warrant a traffic signal at this intersection. Therefore, no mitigations are recommended at the Sullivan Lane/Green Vista Drive intersection. If drivers do not want to wait for a gap to make a left-turn from the westbound approach, they have the option of making a right-turn and then a U-turn at the South Project Access roundabout intersection.

Recommended Improvements

As shown in **Table 6**, the El Rancho Drive/Sullivan Lane and McCarran Boulevard/Sullivan Lane intersections are expected to operate at LOS F under Existing Plus Project conditions. Additionally, the El Rancho Drive/Sun Valley Boulevard intersection is expected to have a volume-to-capacity ratio of 0.99 and needs improvement. The following intersection improvements would mitigate the project's impacts and provide acceptable levels of service:

- El Rancho Drive/Sun Valley Boulevard
 - Convert the existing westbound to northbound right-turn lane to a free right-turn lane with acceleration lane and merge taper
 - Optimize signal timing

Based on NDOT's Access Management System and Standards, 2017 Edition, an acceleration lane on a facility with a posted speed limit of 35 mph should include 280 feet of acceleration length followed by at least 144 feet of taper length (12:1 taper ratio, 12 feet of assumed lane width). The segment of Sun Valley Boulevard north of El Rancho Drive has a 35 mph speed limit. The acceleration lane lengths required above would fit within the existing widened roadway section which extends approximately 550 feet north from El Rancho Drive. Consideration should be given during final design to adjusting these lengths to either intentionally include or exclude the northerly apartment complex driveway within the acceleration lane.

- El Rancho Drive/Sullivan Lane
 - Construct a roundabout at the intersection with a shared through/right-turn lane on the northbound approach, a left-turn lane and a right-turn pocket on the westbound approach, and a left-turn lane and shared through/left-turn lane on the southbound approach (as shown in Exhibit 2 below)



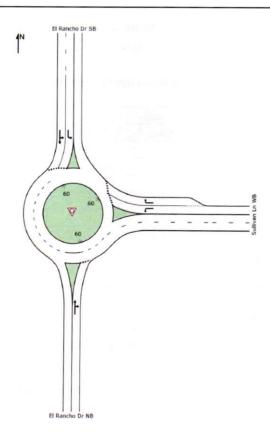


Exhibit 2: Proposed Roundabout Configuration – El Rancho Drive/Sullivan Lane

- McCarran Boulevard/Sullivan Lane
 - Modify northbound lane configurations to include one left-turn lane and a shared through/right-turn lane
 - Modify southbound lane configurations to include two left-turn lanes, one through lane, and one right-turn lane
 - Change northbound and southbound signal phasing to protected left-turns
 - Extend the eastbound left-turn pocket to include 600 feet of striped pocket plus 170 feet of deceleration length plus 180 feet of taper, to provide a conservative length for peak queue storage
 - Optimize signal timing
- McCarran Boulevard/El Rancho Drive
 - Optimize signal timing in coordination with the McCarran Boulevard/Sullivan Lane intersection

All existing bicycle lanes and sidewalks will be perpetuated with the recommended improvements.

Figure 12 shows the recommended intersection improvements for the McCarran Boulevard/Sullivan Lane intersection.



Table 7 shows the Existing Plus Project conditions level of service results with the intersection improvements listed above. The technical calculations are provided in **Appendix B**.

Table 7: Existing Plus Project Intersection Level of Service Results – with Mitigation

		AM			1	Afternoon ¹			PM		
Intersection	Control	LOS	Delay ²	V/C	LOS	Delay ²	V/C	LOS	Delay ²	V/C	
El Rancho Dr/Sun Valley Blvd	Signal	С	25.5	NA	С	23.1	NA	С	26.9	NA	
El Rancho Dr/Sullivan Ln	RAB									No.	
Northbound Approach		С	17.4	0.56	В	10.8	0.47	В	12.9	0.55	
Southbound Approach		В	13.5	0.66	Α	7.2	0.33	Α	6.7	0.33	
Westbound Approach		В	10.5	0.59	С	22.2	0.83	С	19.0	0.73	
McCarran Blvd/Sullivan Ln	Signal	E	64.2	NA	С	28.6	NA	34.2	С	NA	

Notes: 1. The afternoon peak hour is the highest hour between 2:00 PM and 4:00 PM, when school gets out.

Source: Traffic Works, 2019

As shown in the table, the study intersections would operate at acceptable levels of service with the recommended improvements. It should be noted that operations at the McCarran Boulevard/El Rancho Drive intersection are also expected to improve with mitigations at the McCarran Boulevard/Sullivan Lane intersection due to better signal coordination opportunities between the two traffic signals.

Roadway Segment Level of Service

Daily project trips were added to the existing daily roadway segment volumes at the study locations. Existing Plus Project conditions roadway segment level of service was determined by comparing the daily roadway segment volumes (shown on **Figure 10**) to the thresholds in **Table 2**. The daily roadway segment level of service results are shown in **Table 8**.

Table 8: Existing Plus Project Conditions Roadway Segment Level of Service Results

Roadway	Location	Classification ¹	# of Lanes	Volume ²	LOS	v/c Ratio
McCarran Blvd	El Rancho Dr to Sullivan Ln	HAC Arterial	4	29,650	С	0.73
El Rancho Dr	Sun Valley Blvd to Sullivan Ln	MAC Arterial	4 ³	12,160	С	0.33
Sullivan Ln	El Rancho Dr to McCarran Blvd	LAC Arterial	2	8,620	D	0.57

Notes:

- 1. HAC = High Access Control; MAC = Moderate Access Control; LAC = Low Access Control
- 2. Based on 2017 AADT volumes from NDOT's Traffic Records Information Access (TRINA).
- 3. El Rancho Drive has four lanes near Sun Valley Blvd where traffic volume data was collected. South of Sun Valley Blvd, El Rancho Drive has two lanes. The Existing Plus Project traffic volume would operate at LOS C with two lanes as well. Source: Traffic Works, 2019



^{2.} Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and the worst approach/movement for unsignalized (side-street stop controlled) and roundabout intersections.

^{3.} For consistency, the LOS and delay results for the signalized intersections are based on HCM 2000 reports because HCM 2010 does not support turning movement analysis with shared and exclusive lanes.

As shown in the table, the study roadway segments are expected to operate at acceptable levels of service on a daily basis under Existing Plus Project conditions.

FUTURE YEAR (2040) CONDITIONS

Planned Regional Roadway Improvements

The 2040 RTP outlines programmed roadway projects of regional significance. The project list is split into three time periods: 2017 – 2021 (first five years of the plan), 2022 – 2026 (second five years of the plan), and 2027 – 2040 (remaining years of the plan). The key programmed improvement is the widening of McCarran Boulevard from 4 to 6 lanes between El Rancho Drive and Rock Boulevard in the 2027 – 2040 timeframe. The following roadway projects are programmed within the project vicinity.

Note that the Pyramid Highway/Sun Valley/US 395 Connector (listed in italics below) is <u>not</u> included in this traffic analysis to ensure a conservative analysis. Construction of that new roadway would reduce traffic volumes on McCarran Boulevard adjacent to the project site. Therefore, the project mitigations/improvements needed could be <u>less</u> than described in this report. This 2040 Background Conditions analysis presents a <u>worst case scenario</u>, assuming higher background traffic volumes near the proposed high school.

RTP Regional Road Improvements (2017-2021)

- Sun Valley Boulevard 7th Avenue to Pyramid Highway/US 395 Connector: Multimodal improvements (Preliminary Engineering & NEPA Phase)
- Pyramid Highway/Sun Valley/US 395 Connector Phase 1 Queen Way to Golden View: Widen Pyramid Highway to 6 lanes from Queen Way to Golden View (Preliminary Engineering & NEPA Phase)

RTP Regional Road Improvements (2022-2026)

- Sun Valley Boulevard 7th Avenue to Pyramid Highway/US 395 Connector: Multimodal improvements
- Pyramid Highway/Sun Valley/US 395 Connector Phase 1 Queen Way to Golden View: Widen Pyramid Highway to 6 lanes from Queen Way to Golden View

RTP Regional Road Improvements (2027-2040)

- El Rancho Drive/Dandini Boulevard Raggio Parkway to Sullivan Lane: Multimodal improvements, including enhanced sidewalks and bike lanes
- McCarran Boulevard El Rancho Drive to Rock Boulevard: Widen 4 to 6 lanes
- Sun Valley Boulevard 7th Avenue to Highland Ranch Parkway: Multimodal improvements



- Pyramid Highway/Sun Valley/US 395 Connector Phase 2 US 395 to Pyramid Way/Sparks Boulevard: New 6 lane arterial from US 395 to West Sun Valley; New 4 lane arterial from West Sun Valley to Pyramid Way
- Pyramid Highway/Sun Valley/US 395 Connector Phase 3 Widen Disc Drive from Pyramid Highway to Vista Boulevard from 4 to 6 lanes
- Pyramid Highway/Sun Valley/US 395 Connector Phase 4 Interchange improvements at the Connector/Dandini Boulevard interchange
- Pyramid Highway/Sun Valley/US 395 Connector Phase 5 US 395 system ramp improvements
- Pyramid Highway/Sun Valley/US 395 Connector Phase 6 Widen Pyramid Highway from Lazy
 Five Parkway to La Posada Drive from 4 to 6 lanes
- Pyramid Highway/Sun Valley/US 395 Connector Phase 7 Extend Disc Drive from Connector to Pyramid Way: New 4 lane arterial
- Pyramid Highway/Sun Valley/US 395 Connector Phase 8 Construct new interchange at Sparks Boulevard
- Pyramid Highway/Sun Valley/US 395 Connector Phase 9 Operational improvements from La Posada Drive to Calle de la Plata; widen Pyramid Way from Sunset Springs Lane to Calle de la Plata from 2 to 4 lanes

2040 Traffic Volumes

2040 roadway segment and intersection volumes were developed using outputs from the RTC's regional travel demand model. Base year and future year model volumes were used to develop growth rates for the study area roadways and intersections. The model volumes were adjusted upward assuming the worst case scenario that the Pyramid Highway/395 Connector might not be in place by 2040. 2040 Background conditions daily roadway segment and peak hour intersection volumes are shown on **Figure 13**.

2040 No Project Intersection Level of Service Analysis

2040 Background conditions intersection level of service analysis was performed for the study intersections using Synchro 9 analysis software, with reporting for unsignalized intersections based on *HCM 2010* methodology and reporting for signalized intersections based on *HCM 2000* methodology. *HCM 2010* does not enable analysis of signalized intersections with shared through/turn lanes and exclusive turn lanes on the same approach (as currently seen at the McCarran Boulevard/Sullivan Lane intersection). For consistency between analysis scenarios, *HCM 2000* reporting was used for all signalized intersections throughout this report. The level of service analysis assumes six (6) lanes on McCarran Boulevard from El Rancho Drive to Rock Boulevard (per the *2040 RTP*) and the existing lane configurations at all other intersections. The 2040 intersection lane configurations and traffic controls are shown on **Figure 14**. **Table 9** shows the level of service and delay at the study intersections for this study scenario. The technical calculations are provided in **Appendix C**.



Table 9: 2040 Background Intersection Level of Service Results

Intersection	Control	A	M	After	rnoon¹	F	M
intersection	Control	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²
El Rancho Dr / Sun Valley Blvd	Signal	С	27.5	С	24.9	E	57.4
El Rancho Dr / Sullivan Ln	Side-		POLICE TO	A HATELON	0 17 A 16	Value I	ar hann
Westbound Approach	Street	В	14.1	С	17.3	F	51.9
Southbound Left	Stop	Α	8.6	Α	9.0	В	10.4
Sullivan Ln / Niblick Dr	Side-						
Eastbound Approach	Street	В	13.5	В	10.7	В	13.9
Northbound Left	Stop	Α	8.4	Α	8.0	Α	8.3
Sullivan Ln / Green Vista Dr		Charles			Constant		
Eastbound Approach	Side-	С	15.5	В	12.4	С	16.2
Westbound Approach	Street	С	23.6	С	20.3	Е	39.0
Northbound Left	Stop	Α	8.7	Α	8.2	Α	8.3
Southbound Left		Α	8.1	Α	8.0	Α	8.4
McCarran Blud / El Bancha Dr	Cianal						
McCarran Blvd / El Rancho Dr	Signal	D	42.4	С	30.1	D	50.1
McCarran Blvd / Sullivan Ln	Signal	D	36.0	D	38.3	E	68.3

Notes: 1. The afternoon peak hour is the highest hour between 2:00 PM and 4:00 PM, when school gets out.

Source: Traffic Works, 2019

As shown in **Table 9**, the westbound approaches of the El Rancho Drive/Sullivan Lane and Sullivan Lane/Green Vista Drive intersections are expected to operate at LOS F and LOS E during the PM peak hour, respectively. The remaining study intersections are expected to operate acceptably under 2040 Background conditions. However, the El Rancho Drive/Sun Valley Boulevard and McCarran Boulevard/Sullivan Lane intersections would function at LOS E during the PM peak hour.

2040 Background Roadway Segment Level of Service

The study roadway segments were analyzed based on the 2040 Background conditions traffic volumes shown on **Figure 13**. Level of service was determined by comparing the daily traffic volumes to the capacity thresholds provided in **Table 2**. **Table 10** shows the daily roadway segment level of service results for the study roadway segments.



^{2.} Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and the worst approach/movement for unsignalized (side-street stop controlled) intersections.

^{3.} The LOS and delay results for signalized intersections are based on *HCM 2000* reports because *HCM 2010* does not support turning movement analysis with shared and exclusive lanes.

Table 10: 2040 Background Conditions Roadway Segment Level of Service Results

Roadway	Location	Classification ¹	# of Lanes	Volume	LOS	v/c Ratio
McCarran Blvd	El Rancho Dr to Sullivan Ln	HAC Arterial	6	35,000	С	0.57
El Rancho Dr	Sun Valley Blvd to Sullivan Ln	MAC Arterial	4 ²	10,230	В	0.28
Sullivan Ln	El Rancho Dr to McCarran Blvd	LAC Arterial	2	5,600	С	0.37

Notes:

- 1. HAC = High Access Control; MAC = Moderate Access Control; LAC = Low Access Control
- 2. El Rancho Drive has four lanes near Sun Valley Blvd where traffic volume data was collected. East/south of Sun Valley Blvd,

El Rancho Drive has two lanes. The 2040 Background traffic volume would operate at LOS C with two lanes as well.

Source: Traffic Works, 2019

As shown in the table, the study roadway segments are expected to operate at acceptable levels of service on a daily basis under 2040 Background conditions.

2040 Plus Project Traffic Volumes

Project generated trips (Figure 9) were added to the 2040 Background traffic volumes at the study intersections (Figure 13) to develop 2040 Plus Project daily roadway segment and peak hour intersection traffic volumes (shown on Figure 15).

2040 Plus Project Intersection Level of Service

2040 Plus Project intersection level of service analysis was performed using Synchro 9 software for the signalized and stop controlled intersections, with results reported based on *HCM 2000* and *HCM 2010* methodologies, respectively. The roundabout intersections were analyzed using SIDRA software with results reported based on *HCM 2010* methods. Peak hour factors for the AM and Afternoon peak hours (when students generate the majority of the project trips) were calculated assuming approximately 1/3 of students arrive during the 15 minutes before school starts and depart during the 15 minutes after school is dismissed. The 2040 Background conditions intersection peak hour factors were used for the PM peak hour. **Table 11** shows the 2040 Plus Project intersection level of service results for the AM, Afternoon, and PM peak hours. The technical calculations are provided in **Appendix D**.



Table 11: 2040 Plus Project Intersection Level of Service Results

Interception	Cambra II		AM		1	Afternoor	n ²		PM	2.33
Intersection	Control ¹	LOS	Delay ³	V/C	LOS	Delay ³	V/C	LOS	Delay ³	V/C
El Rancho Dr/Sun Valley Blvd	Signal				S. SALIPS	Chit near				
	Jigital	С	29.5	NA	С	31.5	NA	E	70.7	NA
El Rancho Dr/Sullivan Ln	Side-				E 11/25 1	10-25				
Westbound Approach	Street	F	>1,000	NA	F	755.0	NA	F	394.0	NA
Southbound Left	1	С	17.3	NA	В	10.2	NA	В	11.4	NA
Sullivan Ln/North Project Access										170
Northbound Approach	DAD	С	17.8	0.70	В	10.1	0.53	Α	9.5	0.52
Southbound Approach	RAB	В	11.7	0.69	Α	6.8	0.39	Α	7.6	0.44
Westbound Approach		В	10.4	0.39	В	13.9	0.53	Α	7.2	0.14
Sullivan Ln/Niblick Dr	Side-		W - W -		127 07 03					
Eastbound Approach	Street	С	20.6	NA	В	12.1	NA	С	15.1	NA
Northbound Left	Stop	Α	9.4	NA	Α	8.4	NA	Α	8.5	NA
Sullivan Ln/South Project Access					16/25					
Northbound Approach		С	19.1	0.75	Α	8.3	0.43	Α	9.4	0.51
Southbound Approach	RAB	С	18.2	0.77	Α	9.8	0.50	Α	8.7	0.47
Westbound Approach		Α	8.9	0.31	Α	9.7	0.39	A	6.8	0.12
Sullivan Ln/Green Vista Dr			Market 1						0.0	0.11
Eastbound Approach	Side-	С	24.2	NA	С	16.0	NA	С	17.9	NA
Westbound Approach	Street	E	44.9	NA	D	32.0	NA	E	48.3	NA
Northbound Left	Stop	Α	9.3	NA	Α	8.8	NA	A	8.5	NA
Southbound Left		Α	9.0	NA	Α	8.2	NA	A	8.5	NA
			0.00	Alkons		ALC: N			0.5	
McCarran Blvd/El Rancho Dr	Signal	D	49.3	NA	D	41.2	NA	E	56.4	NA
McCarran Blvd/Sullivan Ln	Signal	F	138.3	NA	D	40.3	NA	F	82.9	NA

Notes: 1. RAB = roundabout

Source: Traffic Works, 2019

As shown in the table, the El Rancho Drive/Sullivan Lane and McCarran Boulevard/Sullivan Lane intersections are expected to operate at LOS F during at least one peak hour under 2040 Plus Project conditions. Additionally, the El Rancho Drive/Sun Valley Boulevard intersection is expected to operate at LOS E with a volume-to-capacity ratio greater than 1.0 indicating capacity improvement needs.

The westbound approach of the Sullivan Lane/Green Vista Drive intersection is expected to operate at LOS E with up to 48.3 seconds of delay. It should be noted that the proposed project would not add any traffic to the westbound approach of this intersection, only the northbound and southbound approaches which are expected to operate at LOS A during all three peak hours. This condition (LOS E/F for a minor side street movement, with less than 60 seconds average delay in this case) commonly exists throughout urban and suburban areas and is a manageable situation that does not justify a traffic signal, roundabout,



^{2.} The afternoon peak hour is the highest hour between 2:00 PM and 4:00 PM, when school gets out.

^{3.} Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and the worst approach/movement for unsignalized (side-street stop controlled) and roundabout intersections.

^{4.} The LOS and delay results for the signalized intersections are based on *HCM 2000* reports because *HCM 2010* does not support turning movement analysis with shared and exclusive lanes.

or other major improvement that would disrupt traffic flow on Sullivan Lane (the major street). Additionally, the low side-street volumes (5 westbound vehicles during the AM peak hour and 40 vehicles during the PM peak hour, when LOS E conditions are expected to occur) do not warrant a traffic signal at this intersection. Therefore, no mitigations are recommended at the Sullivan Lane/Green Vista Drive intersection. If drivers do not want to wait for a gap to make a left-turn from the westbound approach, they have the option of making a right-turn and then a U-turn at the South Project Access roundabout.

Recommended Improvements

The El Rancho Drive/Sun Valley Boulevard, El Rancho Drive/Sullivan Lane, and McCarran Boulevard/Sullivan Lane intersections would need mitigations under the 2040 Plus Project conditions. The following intersection improvements would mitigate the project's impacts and provide acceptable levels of service:

- El Rancho Drive/Sun Valley Boulevard
 - Convert the existing westbound to northbound right-turn lane to a free right-turn lane with acceleration lane and merge taper
 - Optimize signal timing

Based on NDOT's Access Management System and Standards, 2017 Edition, an acceleration lane with 280 feet of acceleration length followed by at least 144 feet of taper length should be constructed. Consideration should be given during final design to adjusting these lengths to either intentionally include or exclude the northerly apartment complex driveway within the acceleration lane.

- El Rancho Drive/Sullivan Lane
 - Construct a roundabout at the intersection with a shared through/right-turn lane on the northbound approach, a left-turn lane and right-turn lane on the westbound approach, and a left-turn lane and shared through/left-turn lane on the southbound approach (see Exhibit 2 on page 16)
- McCarran Boulevard/Sullivan Lane (see Figure 12)
 - Modify the northbound lane configurations to include one left-turn lane and a shared through/right-turn lane
 - Modify the southbound lane configurations to include two left-turn lanes, one through lane, and one right-turn lane
 - Change the northbound and southbound signal phasing to protected left-turns
 - Extend the eastbound left-turn pocket to include 600 feet of striped pocket plus 170 feet of deceleration length plus 180 of taper, to provide a conservative length for peak queue storage
 - Optimize signal timing



- McCarran Boulevard/El Rancho Drive
 - Optimize signal timing in coordination with the McCarran Boulevard/Sullivan Lane intersection

All existing bicycle lanes and sidewalks would be perpetuated with the recommended improvements.

Table 12 shows the 2040 Plus Project conditions level of service results with the intersection improvements listed above.

Table 12: 2040 Plus Project Intersection Level of Service Results - with Mitigation

Intersection	Control	AM AM			1	Afternoon ¹			PM			
Intersection	Control	LOS	Delay ²	V/C	LOS	Delay ²	V/C	LOS	Delay ²	V/C		
El Rancho Dr/Sun Valley Blvd	Signal											
		С	26.5	NA	С	23.8	NA	D	35.2	NA		
El Rancho Dr/Sullivan Ln	RAB								L.F.			
Northbound Approach		С	17.9	0.58	В	11.8	0.52	С	16.1	0.65		
Southbound Approach		В	13.9	0.67	Α	7.3	0.33	Α	6.9	0.34		
Westbound Approach		В	10.7	0.59	С	22.6	0.82	С	24.7	0.80		
McCarran Blvd/Sullivan Ln	Signal											
iviccarran biva/Sumvan En	Signal	D	50.5	NA	С	26.7	NA	D	36.0	NA		

Notes: 1. The afternoon peak hour is the highest hour between 2:00 PM and 4:00 PM, when school gets out.

As shown in the table, the study intersections would operate at acceptable levels of service with the recommended improvements.

Roadway Segment Level of Service

Daily project trips were added to the 2040 daily roadway segment volumes at the study locations. 2040 Plus Project conditions roadway segment level of service was determined by comparing the daily roadway segment volumes (shown on **Figure 15**) to the thresholds in **Table 2**. The daily roadway segment level of service results are shown in **Table 13**.



^{2.} Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and the worst approach/movement for unsignalized (side-street stop controlled) and roundabout intersections.

^{3.} For consistency, the LOS and delay results for the signalized intersections are based on *HCM 2000* reports because *HCM 2010* does not support turning movement analysis with shared and exclusive lanes.

Source: Traffic Works, 2019

Table 13: 2040 Plus Project Conditions Roadway Segment Level of Service Results

Roadway	Location	Classification ¹	# of Lanes	Volume ²	LOS	v/c Ratio
McCarran Blvd	El Rancho Dr to Sullivan Ln	HAC Arterial	6	35,650	С	0.59
El Rancho Dr	Sun Valley Blvd to Sullivan Ln	MAC Arterial	4 ³	12,290	С	0.33
Sullivan Ln	El Rancho Dr to McCarran Blvd	LAC Arterial	2	8,620	D	0.57

Notes:

- 1. HAC = High Access Control; MAC = Moderate Access Control; LAC = Low Access Control
- 2. Based on 2017 AADT volumes from NDOT's Traffic Records Information Access (TRINA).
- 3. El Rancho Drive has four lanes near Sun Valley Blvd where traffic volume data was collected. South of Sun Valley Blvd, El Rancho Drive has two lanes. The 2040 Plus Project traffic volume would operate at LOS C with two lanes as well.

Source: Traffic Works, 2019

As shown in the table, the study roadway segments are expected to operate at acceptable levels of service on a daily basis under 2040 Plus Project conditions.

CONCLUSIONS & RECOMMENDATIONS

The following is a list of our key findings and recommendations:

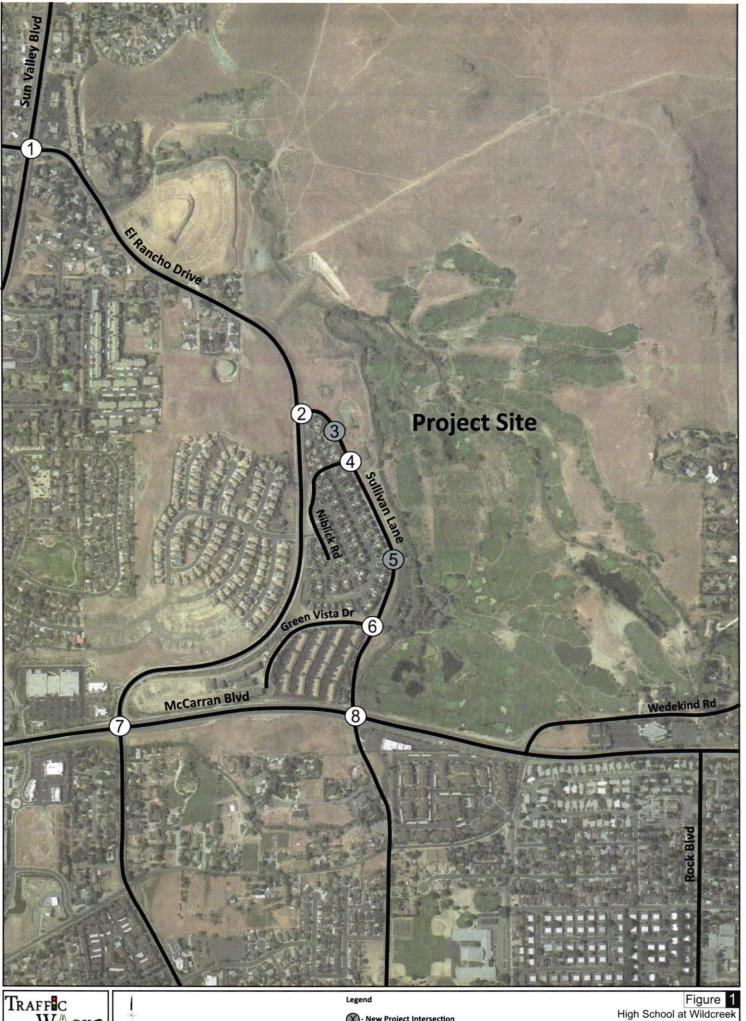
- The proposed High School at Wildcreek would have 2,125 students and 150 employees/staff.
- The future school zoning boundary is generally anticipated to include the current Hug High School zoning district and all of Sun Valley.
- The proposed project would generate approximately 4,314 Daily, 1,105 AM peak hour, 701
 Afternoon peak hour, and 298 PM peak hour trips. It is anticipated that the proposed high school
 would be a closed campus, meaning students are not permitted to leave or enter the campus
 during the middle of the day without permission (i.e. students may not leave campus for lunch,
 etc.).
- Access to the project site would be provided via two new roundabout intersections on Sullivan Lane. Exhibit 1 on page 12 shows the proposed roundabout lane configurations.
- Under Existing Plus Project conditions and 2040 Plus Project conditions, the El Rancho Drive/Sullivan Lane and McCarran Boulevard/Sullivan Lane intersections would operate at LOS F unless improved. Additionally, the El Rancho Drive/Sun Valley Boulevard intersection is expected to have a volume-to-capacity ratio greater than 1.0 and would also require capacity improvements.
- The following intersection improvements would mitigate the project's impacts and improve operations to acceptable levels:
 - El Rancho Drive/Sun Valley Boulevard
 - Convert the existing westbound to northbound right-turn lane to a free right-turn lane with acceleration lane and merge taper
 - Optimize signal timing



Based on NDOT's Access Management System and Standards, 2017 Edition, an acceleration lane with 280 feet of acceleration length followed by at least 144 feet of taper length should be constructed. Consideration should be given during final design to adjusting these lengths to either intentionally include or exclude the northerly apartment complex driveway within the acceleration lane.

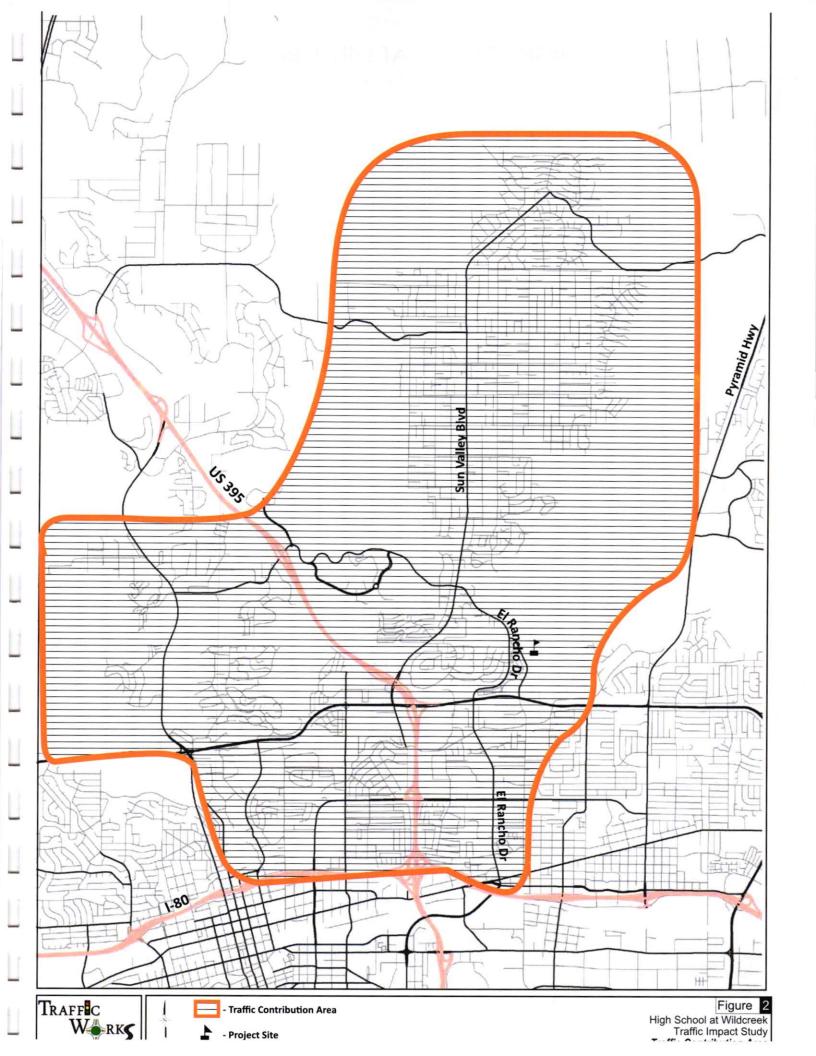
- o El Rancho Drive/Sullivan Lane -
 - Construct a roundabout at the intersection with a shared through/right-turn lane
 on the northbound approach, a left-turn lane and a right-turn pocket on the
 westbound approach, and a left-turn lane and shared through/left-turn lane on
 the southbound approach (see Exhibit 2 on page 16)
- McCarran Boulevard/Sullivan Lane (see Figure 12)
 - Modify northbound lane configurations to include one left-turn lane and a shared through/right-turn lane
 - Modify southbound lane configurations to include two left-turn lanes, one through lane, and one right-turn lane
 - Change northbound and southbound signal phasing to protected left-turns
 - Extend the eastbound left-turn pocket to include 600 feet of striped pocket plus 170 feet of deceleration length plus 180 feet of taper, to provide a conservative length for peak queue storage
 - Optimize signal timing
- McCarran Boulevard/El Rancho Drive
 - Optimize signal timing in coordination with the McCarran Boulevard/Sullivan Lane intersection
- The following multimodal improvements are also recommended as shown in Figure 5:
 - o Sullivan Lane: Construct sidewalks and bicycle lanes along the project frontage
 - East side of Sullivan Lane between Wedekind Road and El Rancho Drive, east side of El Rancho Drive north of Sullivan Lane, and on the north side of McCarran Boulevard west of Sullivan Lane: Construct sidewalk at select locations to fill in gaps in the existing walking infrastructure
 - Public Transit: Based on RTC direction, potentially construct an RTC RIDE transit stop on Sullivan Lane near the campus entrance. The RTC may wish to consider changes to Route 15 to better serve high school students and staff
 - Implement a 15 mph "school zone" on Sullivan Lane during the morning arrival and afternoon dismissal peak travel periods (specific times to be based on the actual school hours schedule)

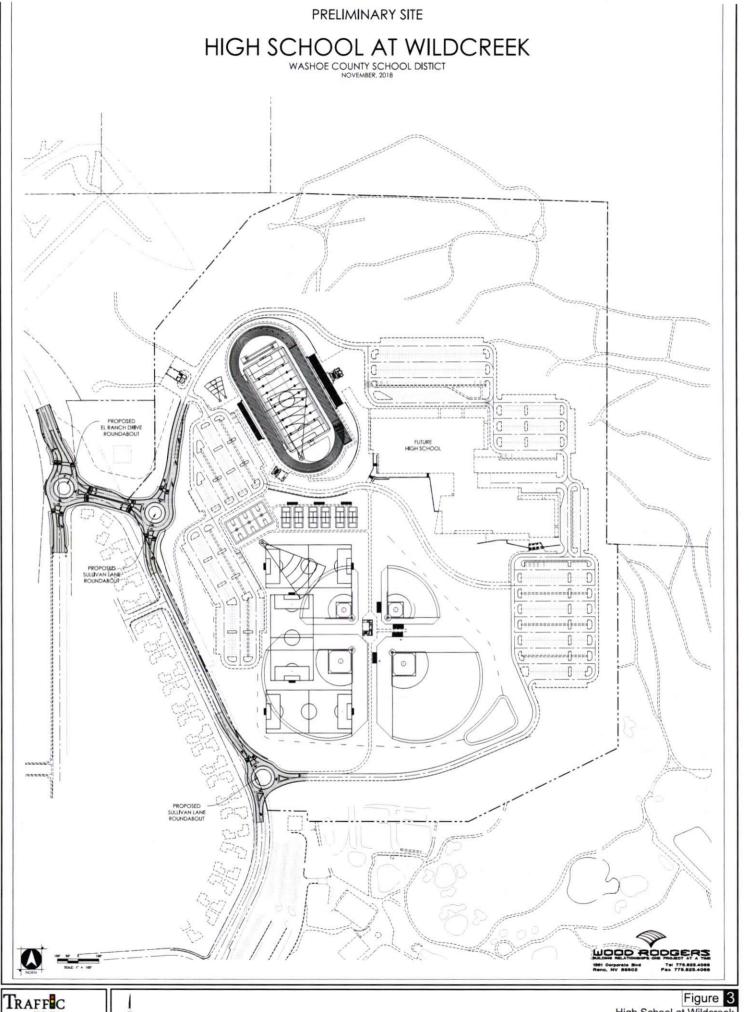




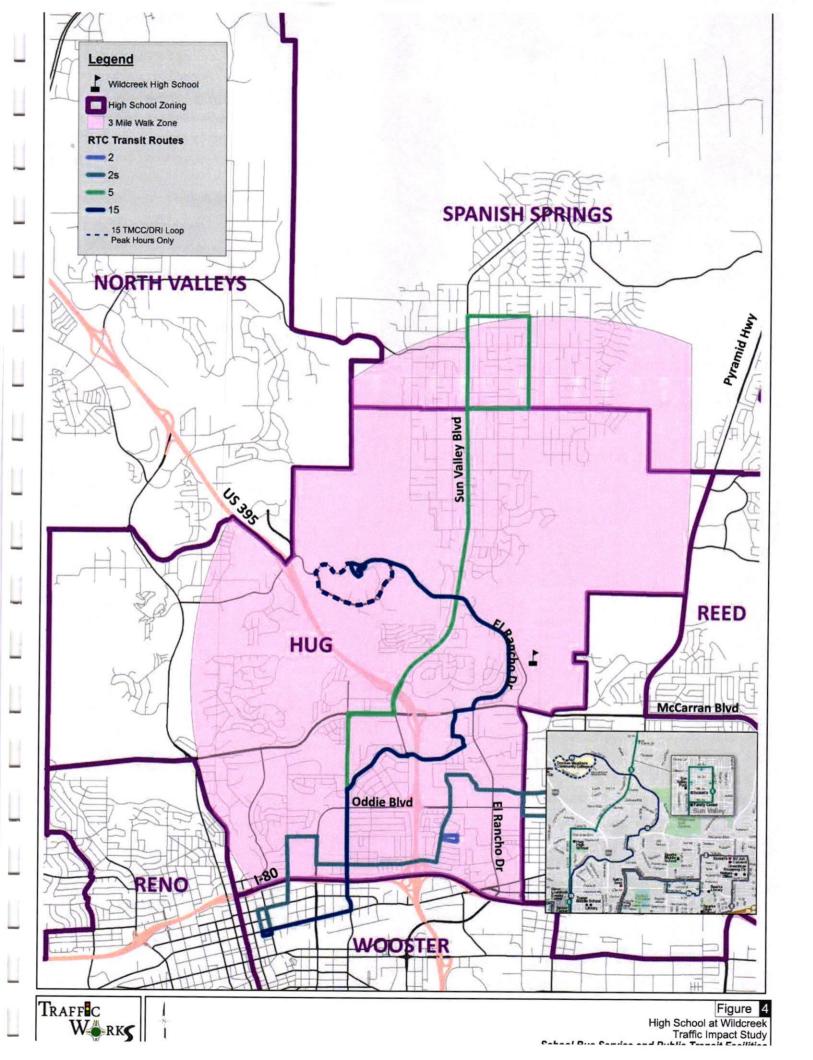


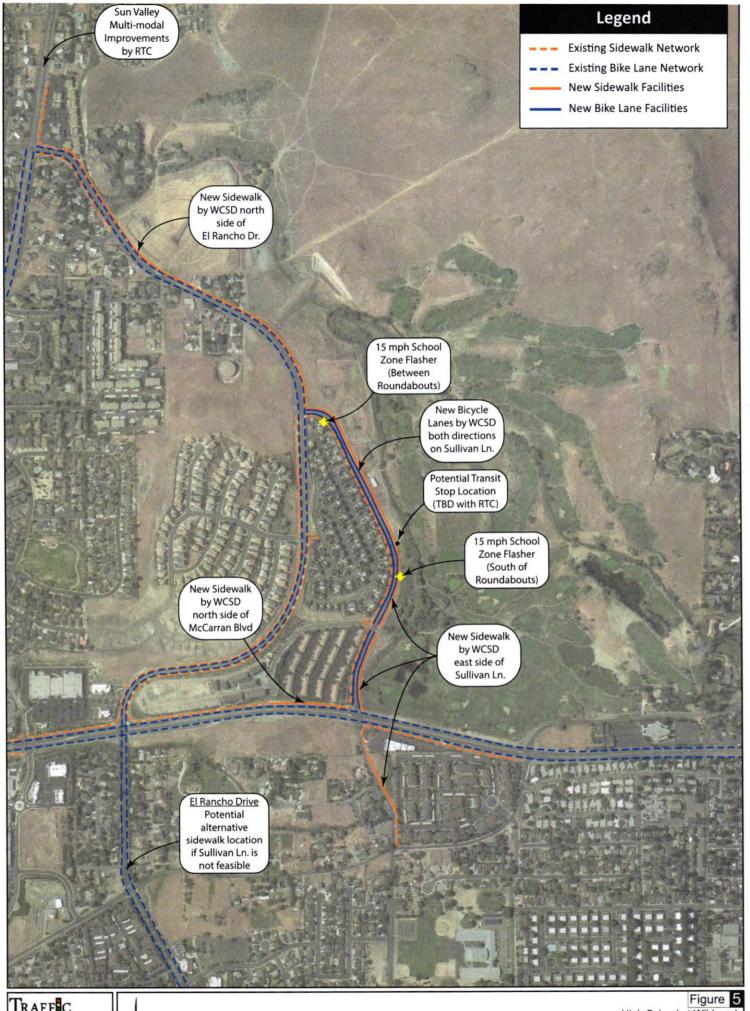




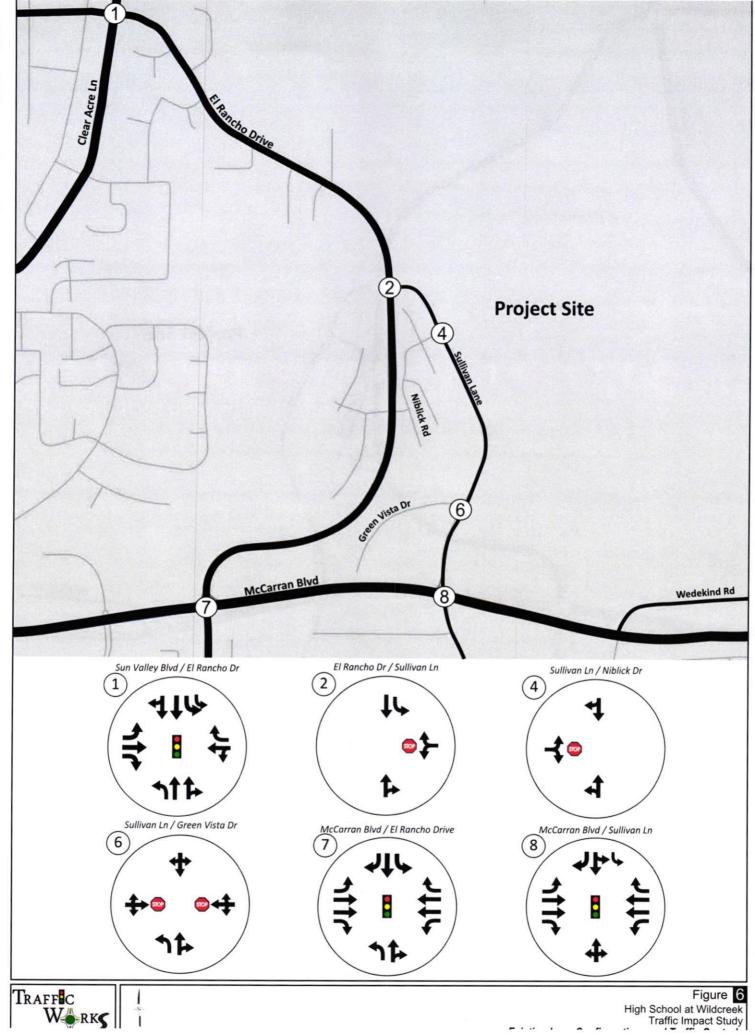


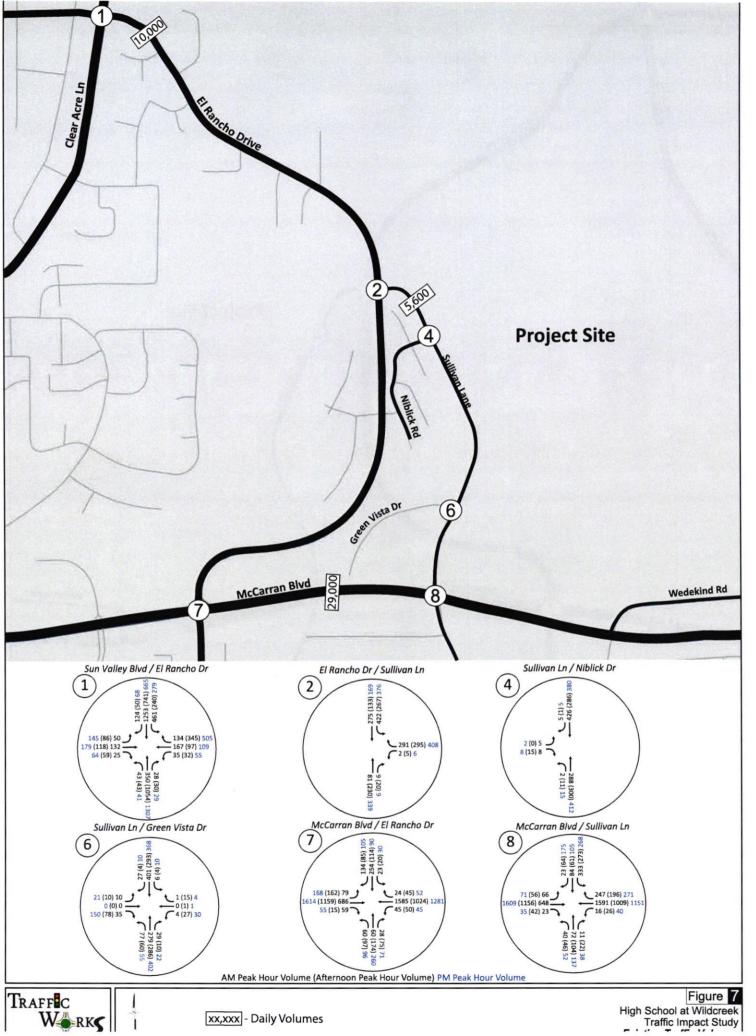




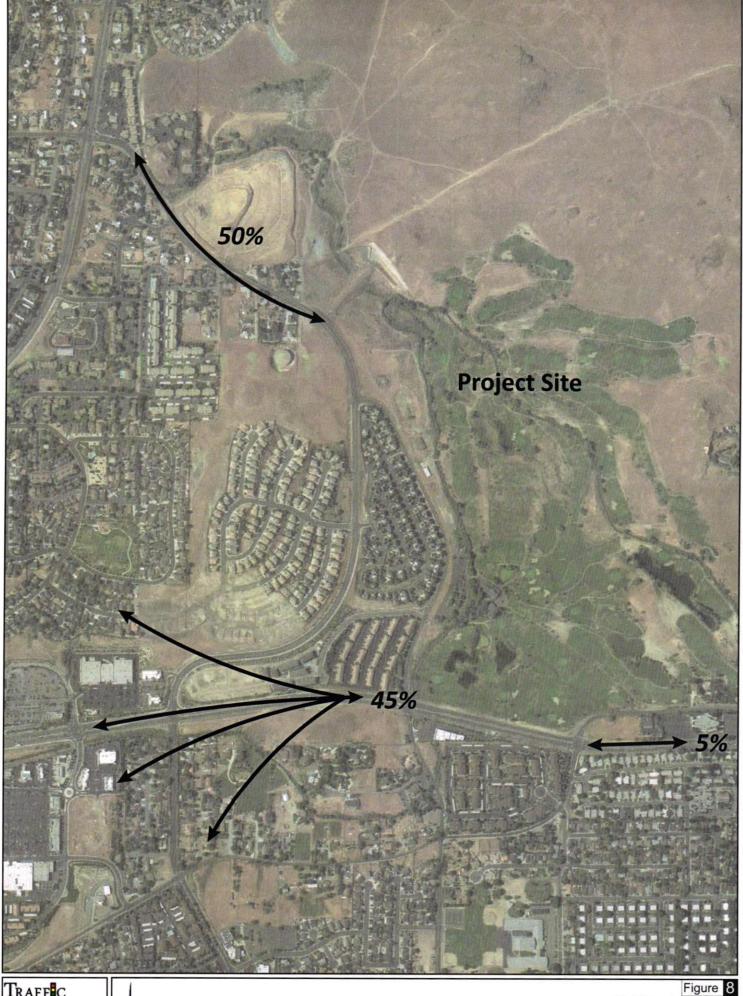




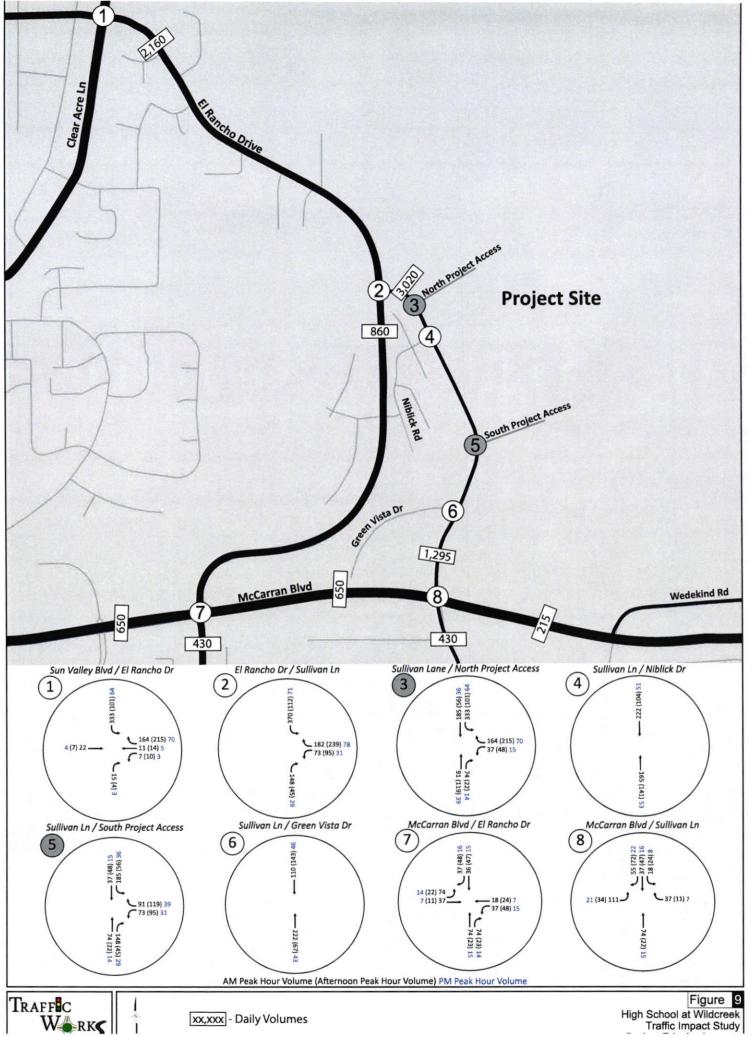




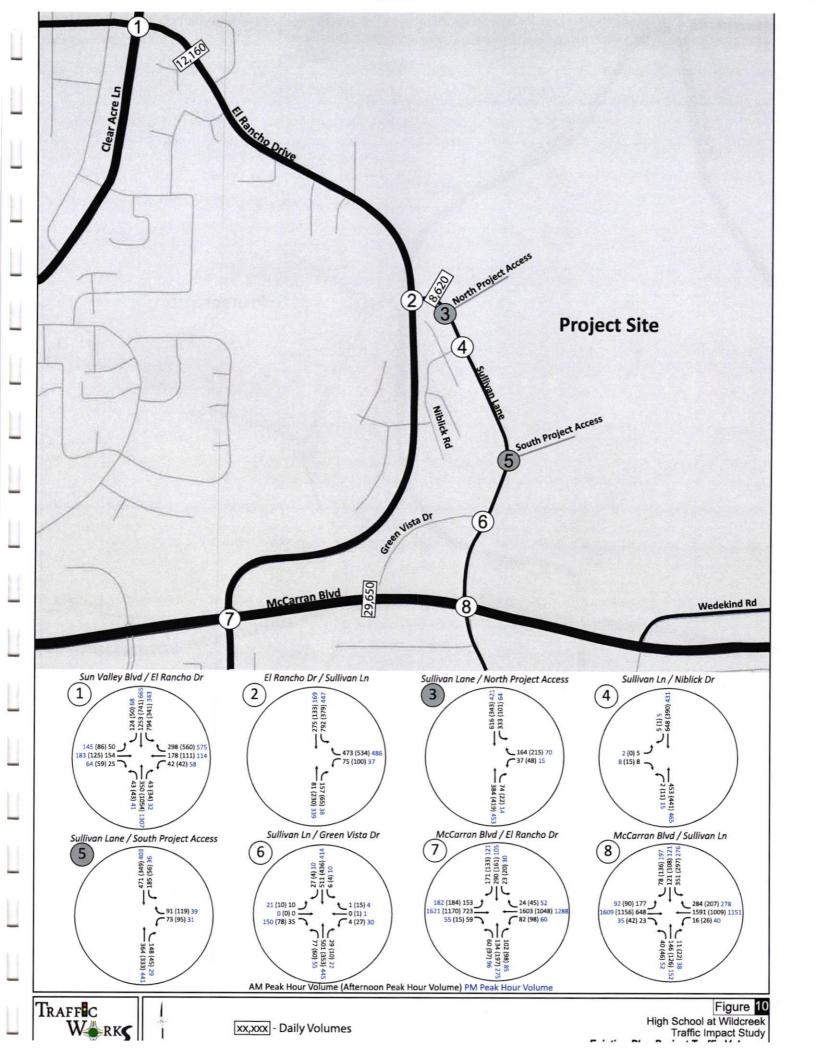
Traffic Impact Study

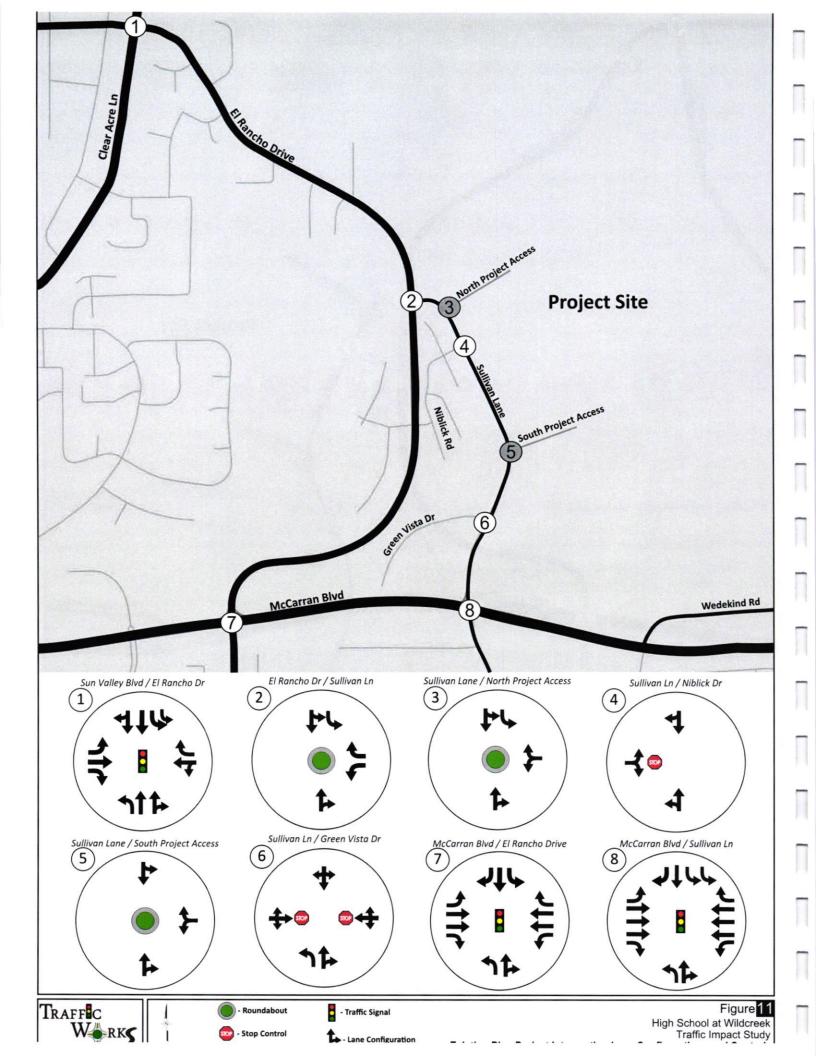


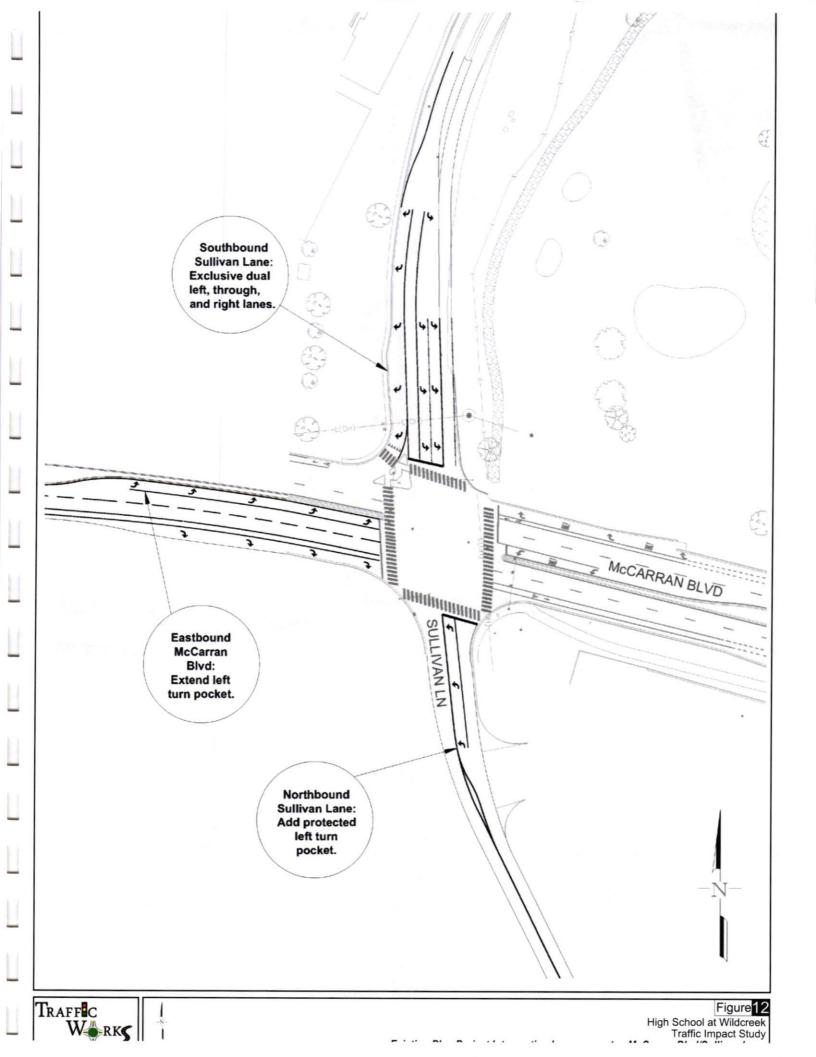
Traffic Wark Figure 8
High School at Wildcreek
Traffic Impact Study

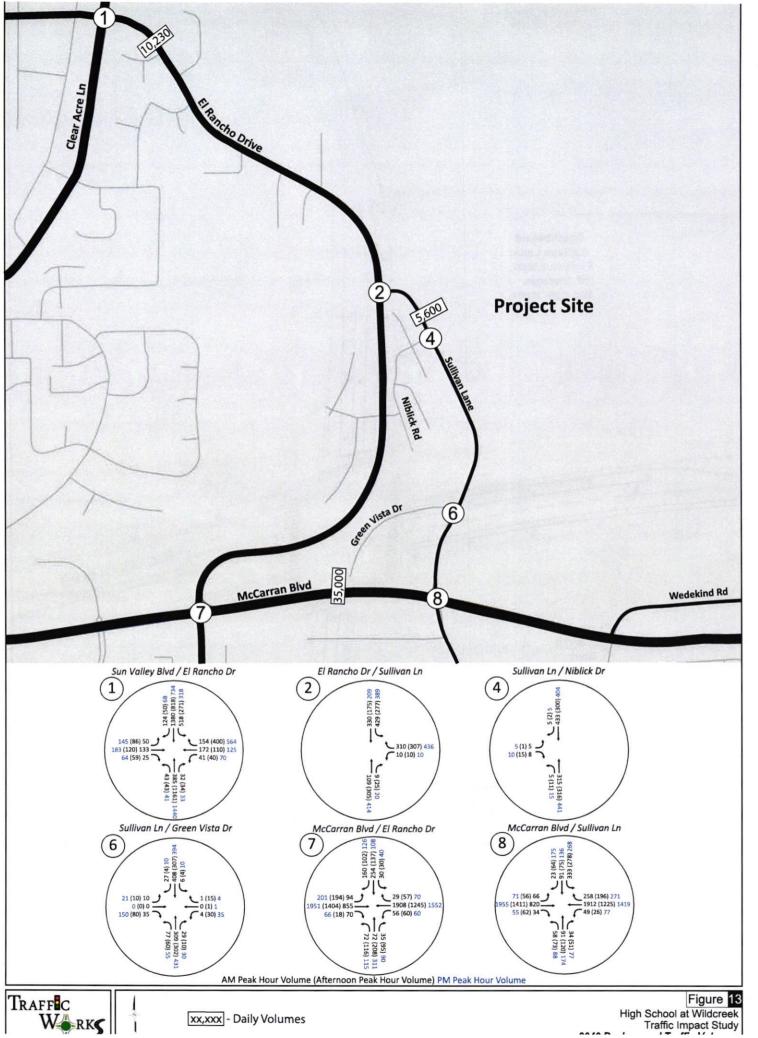


High School at Wildcreek Traffic Impact Study

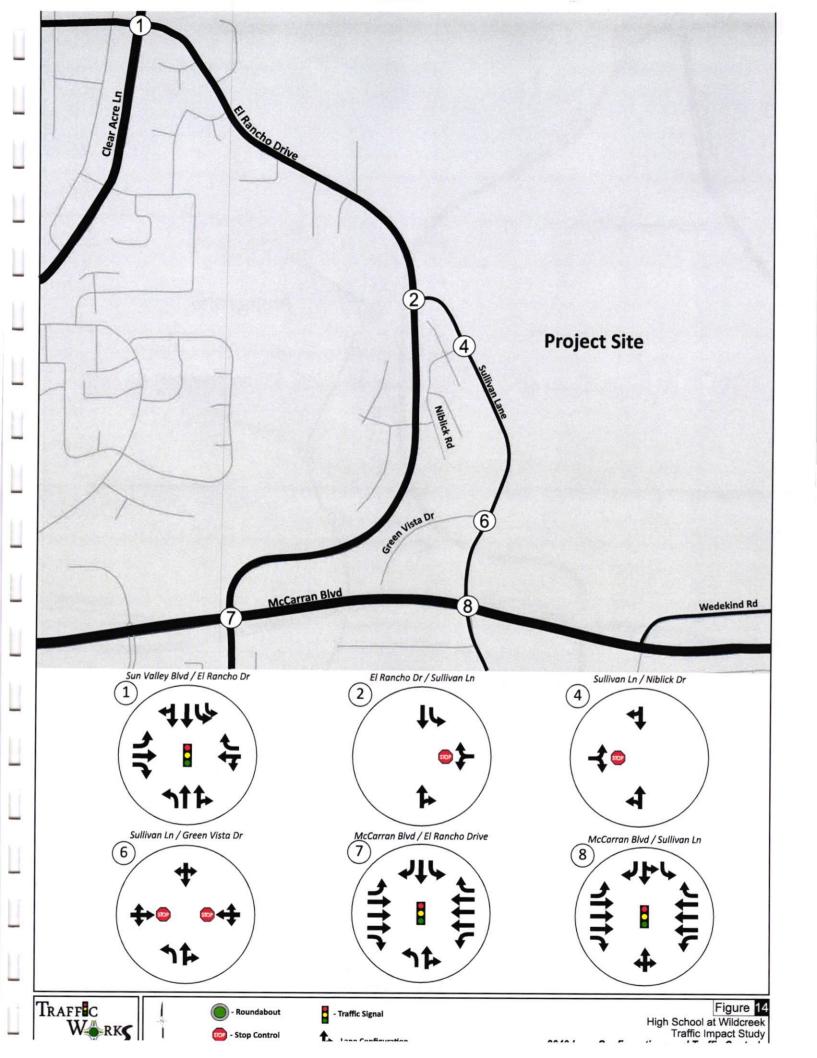


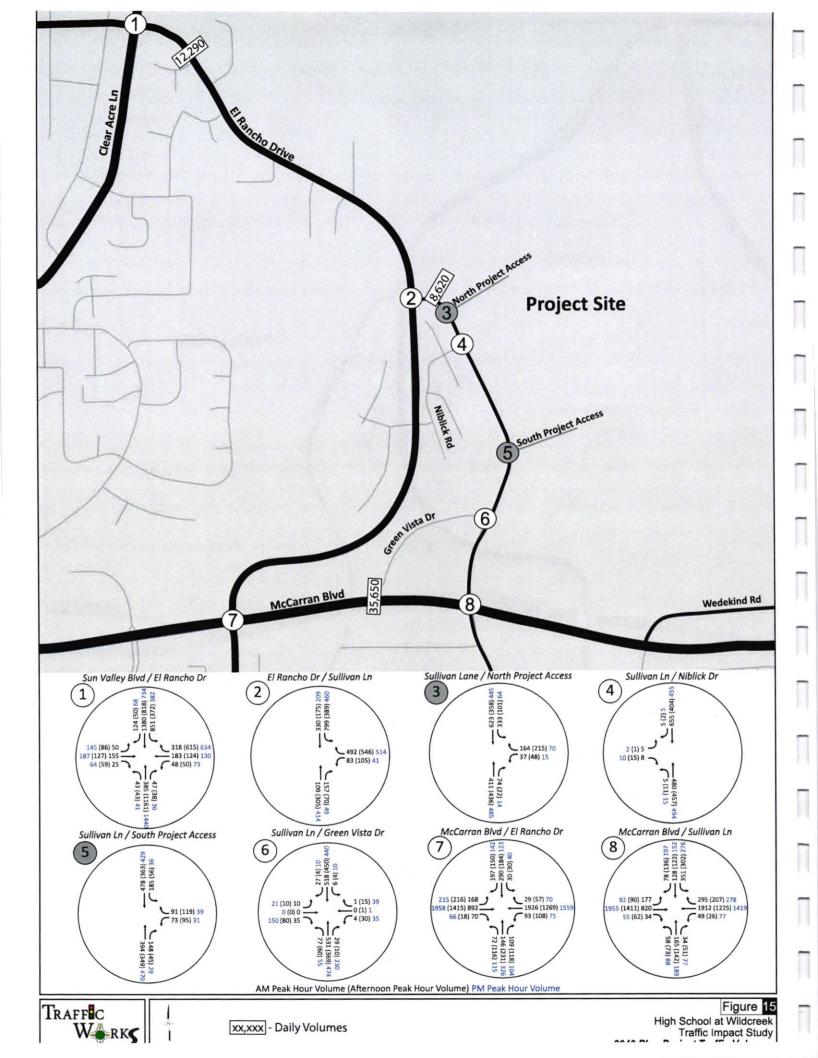


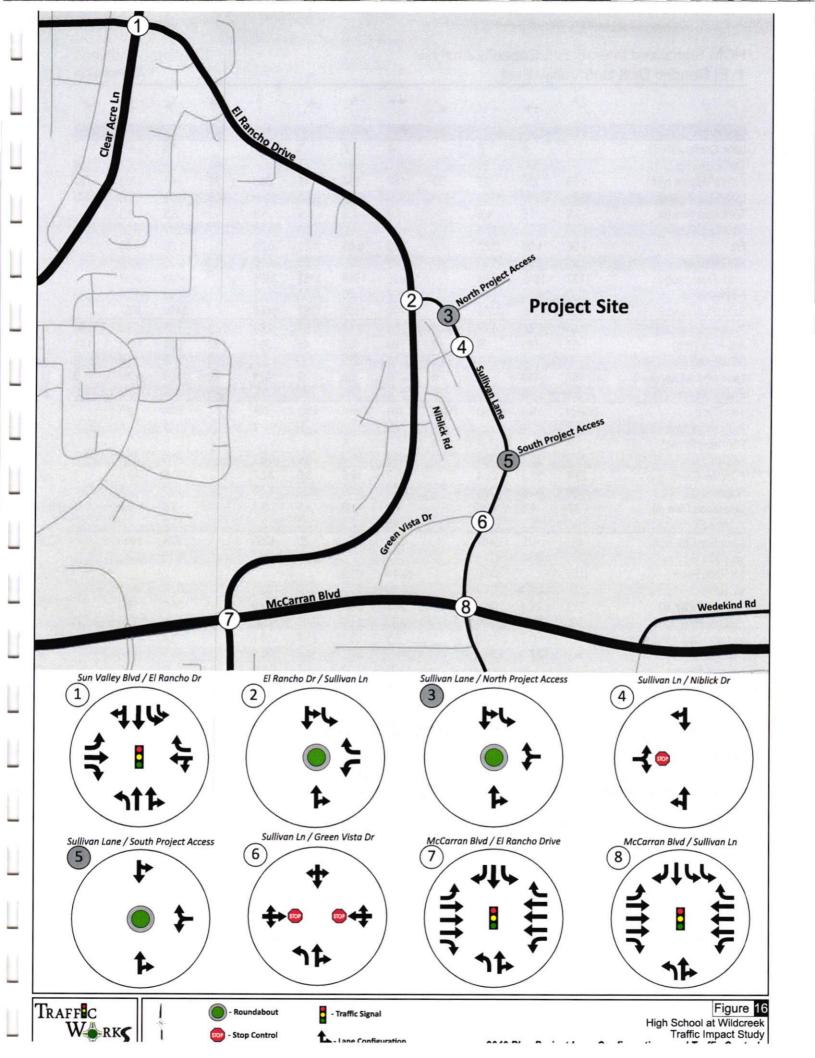




High School at Wildcreek Traffic Impact Study







	٠	→	•	•	←	•	4	†	~	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	↑	7		4	7	7	† ‡		ሻሻ	† ‡	
Traffic Volume (vph)	50	132	25	35	167	134	43	350	28	461	1253	124
Future Volume (vph)	50	132	25	35	167	134	43	350	28	461	1253	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1829	1568	1752	3466		3400	3457	
Flt Permitted	0.30	1.00	1.00		0.92	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	550	1845	1568		1700	1568	1752	3466		3400	3457	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	57	150	28	40	190	152	49	398	32	524	1424	141
RTOR Reduction (vph)	0	0	21	0	0	123	0	6	0	0	6	0
Lane Group Flow (vph)	57	150	7	0	230	29	49	424	0	524	1559	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	23.4	23.4	23.4		16.9	16.9	3.6	32.7		20.5	49.6	
Effective Green, g (s)	23.4	23.4	23.4		16.9	16.9	3.6	32.7		20.5	49.6	
Actuated g/C Ratio	0.26	0.26	0.26		0.19	0.19	0.04	0.36		0.23	0.55	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	191	479	407		319	294	70	1259		774	1905	
v/s Ratio Prot	0.01	c0.08					c0.03	0.12		0.15	c0.45	
v/s Ratio Perm	0.07		0.00		c0.14	0.02						
v/c Ratio	0.30	0.31	0.02		0.72	0.10	0.70	0.34		0.68	0.82	
Uniform Delay, d1	26.1	26.8	24.8		34.3	30.2	42.7	20.8		31.7	16.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3	0.0		7.3	0.1	21.8	0.7		2.4	4.1	
Delay (s)	26.4	27.1	24.8		41.7	30.3	64.5	21.5		34.1	20.6	
Level of Service	C	C	С		D	С	Е	С		С	C	
Approach Delay (s)		26.7			37.2			25.9			24.0	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.0	Н	CM 2000	Level of	Service		С			
HCM 2000 Volume to Cap	acity ratio		0.77				13					
Actuated Cycle Length (s)			90.0	S	um of los	t time (s)			16.3			
Intersection Capacity Utiliz	ation		74.5%	IC	CU Level	of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	6.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		1		*	†
Traffic Vol, veh/h	2	291	81	9		275
Future Vol., veh/h	2	291	81	9		275
Conflicting Peds, #/hr		0	0	0		0
Sign Control	Stop	Stop	Free	Free		Free
RT Channelized	REAL PROPERTY.	and the second second		WINDS THE PERSON		None
Storage Length	0	-	-	-		-
Veh in Median Storag	e,# 0		0			0
Grade, %	0	-	0			0
Peak Hour Factor	85	85	85	85		85
Heavy Vehicles, %	2	2	2	2		2
Mymt Flow	2	342	95	11	496	324
WWITTIOW		342	90	- 11	490	324
Major/Minor	Minor1		Major1	4464	Major2	
Conflicting Flow All	1417	101	0	0	106	0
Stage 1	101	8 3 B S				
Stage 2	1316	-	-		-	-
Critical Hdwy	6.42	6.22	-		4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42		700	Wat had	Carl Mari	
Follow-up Hdwy	3.518	3 318	-	_	2.218	-
Pot Cap-1 Maneuver	151	954			1485	
Stage 1	923	304	-	-	1700	-
Stage 2	251				RESE	
Platoon blocked, %	201					
	101	054	-	-	4405	-
Mov Cap-1 Maneuver	101	954			1485	
Mov Cap-2 Maneuver	101	-	-	-	-	-
Stage 1	923	-				
Stage 2	167	-	-	-	-	-
Approach	WB	B) A)	NB		SB	
HCM Control Delay, s	11.4		0		5.2	
HCM LOS	В		U		5.2	
TICWI LOS	Ь	FUNDAMENT	1000121010			CA CHIEFE
STREET, STREET		District.				
Minor Lane/Major Mvn	nt	NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)				902	1485	
HCM Lane V/C Ratio		-	-	0.382		-
HCM Control Delay (s)		-			8.6	
HCM Lane LOS		-	-	В	A	-
HCM 95th %tile Q(veh)			1.8	1.5	
7,000						

Intersection						
Int Delay, s/veh	0.3				Section Caret	CARRENIE
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y	COIL	NDL	4	7	ODIN
Traffic Vol, veh/h	5	8	2	288	426	5
Future Vol, veh/h	5	8	2	288	426	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	CHARLES SHEET AND				
	0	None	•	AND DESCRIPTION OF THE PARTY OF	•	None -
Storage Length		-	-	-	-	
Veh in Median Storage		-		0	0	•
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	9	2	331	490	6
Major/Miner	Minor		Majort		Anion	
	Minor2		Major1		Major2	^
Conflicting Flow All	829	493	495	0	-	0
Stage 1	493	•				•
Stage 2	336	-	-			-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-		-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318	2.218		-	-
Pot Cap-1 Maneuver	340	576	1069			
Stage 1	614	-	-	-	-	-
Stage 2	724				rate of	
Platoon blocked, %	147	No see	4-11-5	-		-
Mov Cap-1 Maneuver	339	576	1069			
	339	3/0		-	-	-
Mov Cap-2 Maneuver		KIZO NEODE	-	-	-	
Stage 1	614					
Stage 2	723		-		-	-
Approach	EB		NB		SB	
HCM Control Delay, s	13.2		0.1		0	
			U. I		U	
HCM LOS	В			CONT. Specialis		
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1069		Sales Property		
HCM Lane V/C Ratio		0.002		0.033	-	-
HCM Control Delay (s		8.4				
HCM Lane LOS		Α	A	В	-	-
HCM 95th %tile Q(veh	١	0	^	DOUGH A THE		
TOW South Wille Colven)	U	1	0.1		

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		1	1			4	
Traffic Vol, veh/h	10	0	35	4	0	1	77	279	29	6	401	27
Future Vol, veh/h	10	0	35	4	0	1	77	279	29	6	401	27
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		Name and Address of the Owner, where	None		Name and Address of the Owner, where the Owner, which the	None			None			None
Storage Length	-	-	-	-	-	-	140	-	-	-	_	-
Veh in Median Storage	e.# -	0			0			0			0	
Grade, %		0	_		0		-	0		-	0	
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	41	5	0	1	90	324	34	7	466	31
											.00	01
Major/Minor	Minor2			Minor1			Major1		-	Major		
Conflicting Flow All	1017	1033	482	1036	1032			^		Major2	0	^
Stage 1	496	496	482	520		341	498	0	0	358	0	0
The state of the s	521	537	1000		520	•			-			
Stage 2			6.00	516	512	6.00	140	-	-	4.40	-	-
Critical Hdwy	7.12 6.12	6.52 5.52	6.22	7.12	6.52	6.22	4.12		1	4.12		
Critical Hdwy Stg 1			·	6.12	5.52	Vii 194 m		-	MARKET PROPERTY.		-	-
Critical Hdwy Stg 2	6.12	5.52	2 240	6.12	5.52	2 240	0.040			0.040		
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	
Pot Cap-1 Maneuver	216	232	584	210	233	701	1066	-		1201		
Stage 1	556	545	-	539	532	-		-	-		-	
Stage 2	539	523	•	542	536		-					
Platoon blocked, %	000	044	F04	400	040	704	4000	-	-	4004	-	-
Mov Cap-1 Maneuver	200	211	584	182	212	701	1066			1201		•
Mov Cap-2 Maneuver	200	211	-	182	212	-		-	-		-	-
Stage 1	509	541		493	487							
Stage 2	493	479	-	500	532	-	-	-	-	-	_	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	15.1			22.3			1.7			0.1		
HCM LOS	С			С								
									Sales and			
Minor Lane/Major Mvm	t	NBL	NBT	NBR	EBLn1V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		1066			409	214	1201	-			STEELE	
HCM Lane V/C Ratio		0.084	-	-	0.128	0.027	0.006	-	-			
HCM Control Delay (s)		8.7			15.1	22.3	8	0				
HCM Lane LOS		Α	-	-	C	С	Α	Α	-			
HCM 95th %tile Q(veh)		0.3			0.4	0.1	0		-			

	٠	→	•	1	←	•	4	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	ř	ሻ	^	7	ሻ	4		ሻ	†	ř
Traffic Volume (vph)	79	686	59	45	1585	24	60	60	28	23	254	134
Future Volume (vph)	79	686	59	45	1585	24	60	60	28	23	254	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1774		1770	1863	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1774		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	84	730	63	48	1686	26	64	64	30	24	270	143
RTOR Reduction (vph)	0	0	30	0	0	13	0	14	0	0	0	114
Lane Group Flow (vph)	84	730	33	48	1686	13	64	80	0	24	270	29
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	10.5	68.1	68.1	7.3	64.9	64.9	7.1	28.2		4.4	24.5	24.5
Effective Green, g (s)	10.5	68.1	68.1	7.3	64.9	64.9	7.1	28.2		4.4	24.5	24.5
Actuated g/C Ratio	0.08	0.52	0.52	0.06	0.50	0.50	0.05	0.22		0.03	0.19	0.19
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	142	1853	829	99	1766	790	96	384	ALC: U	59	351	298
v/s Ratio Prot	c0.05	c0.21		0.03	c0.48		c0.04	0.05		0.01	c0.14	
v/s Ratio Perm			0.02			0.01						0.02
v/c Ratio	0.59	0.39	0.04	0.48	0.95	0.02	0.67	0.21		0.41	0.77	0.10
Uniform Delay, d1	57.7	18.6	15.1	59.5	31.1	16.4	60.3	41.7		61.5	50.1	43.6
Progression Factor	1.00	1.00	1.00	0.49	1.71	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.3	0.6	0.1	0.6	7.4	0.0	12.7	0.1		1.7	8.8	0.1
Delay (s)	62.0	19.2	15.1	30.0	60.6	16.5	73.0	41.8		63.2	58.9	43.7
Level of Service	E	В	В	C	Е	В	Е	D		E	E	D
Approach Delay (s)		23.0			59.2			54.5			54.1	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			48.4	Н	ICM 2000	Level of	Service		D			
HCM 2000 Volume to Capa	city ratio		0.86									
Actuated Cycle Length (s)			130.0	S	um of los	t time (s)			23.0			
Intersection Capacity Utiliza	tion		84.1%			of Service	9		Е			
Analysis Period (min)			15									150
Analysis Period (min) c Critical Lane Group			15									

	•	→	•	•	-	•	1	†	-	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	66	648	23	16	1591	247	40	72	11	333	84	23
Future Volume (vph)	66	648	23	16	1591	247	40	72	11	333	84	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	0.97	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1811		1681	1718	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	0.97	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1811		1681	1718	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	661	23	16	1623	252	41	73	11	340	86	23
RTOR Reduction (vph)	0	0	11	0	0	70	0	4	0	0	0	19
Lane Group Flow (vph)	67	661	12	16	1623	182	0	121	0	211	215	4
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8	· Oilli	2	2		6	6	I Cilli
Permitted Phases		raunia.	4			8	Herita				U D	6
Actuated Green, G (s)	8.2	67.8	67.8	2.8	62.7	62.7		13.1		20.8	20.8	20.8
Effective Green, g (s)	8.2	67.8	67.8	2.8	62.7	62.7		13.1		20.8	20.8	20.8
Actuated g/C Ratio	0.06	0.52	0.52	0.02	0.48	0.48		0.10		0.16	0.16	0.16
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	111	1845	825	38	1706	763	18 50 97	182	THE PARTY	268	274	253
v/s Ratio Prot	c0.04	c0.19	020	0.01	c0.46	700		c0.07		c0.13	0.13	255
v/s Ratio Perm	MEANS	100110	0.01	0.01	00.40	0.11		00.07		CO. 13	0.13	0.00
v/c Ratio	0.60	0.36	0.01	0.42	0.95	0.24		0.67		0.79	0.78	0.00
Uniform Delay, d1	59.3	18.3	15.0	62.8	32.2	19.7		56.3		52.5	52.4	46.0
Progression Factor	1.22	0.37	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	5.9	0.5	0.0	2.7	13.0	0.7		7.0		13.1	12.7	0.0
Delay (s)	78.1	7.4	15.0	65.5	45.2	20.4		63.3		65.6	65.1	46.0
Level of Service	E	A	В	E	D	C		65.5 E		03.0 E	E	40.0 D
Approach Delay (s)		13.9			42.0	0		63.3		_	64.4	U
Approach LOS		В			D			65.5 E			E	
Intersection Summary								_		H262 N23 N03		
HCM 2000 Control Delay			39.4	Н	M 2000	Level of S	onvico		D			
HCM 2000 Volume to Capaci	ty ratio		0.86	IK	JIVI 2000	Level UI O	CIVICE		U			
Actuated Cycle Length (s)	ij ratio		130.0	Ç.	m of lost	time (c)		OS TON	25.5			SERVICE
Intersection Capacity Utilization	nn.		81.2%		U Level o				25.5 D		PAGE 1811	
Analysis Period (min)			15	10	C LEVEL O	1 Sel VICE	255 2 2 2 2 2		U			
c Critical Lane Group			15									

	۶	→	•	•	←	•	•	†	~	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	↑	7		4	7	7	1		44	†	
Traffic Volume (vph)	86	118	59	32	97	345	43	1054	30	240	741	50
Future Volume (vph)	86	118	59	32	97	345	43	1054	30	240	741	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1822	1568	1752	3490		3400	3471	
FIt Permitted	0.39	1.00	1.00		0.89	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	719	1845	1568		1639	1568	1752	3490		3400	3471	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	102	140	70	38	115	411	51	1255	36	286	882	60
RTOR Reduction (vph)	0	0	55	0	0	350	0	2	0	0	4	0
Lane Group Flow (vph)	102	140	15	0	153	61	51	1289	0	286	938	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	19.8	19.8	19.8		13.3	13.3	8.6	44.0		12.8	48.2	
Effective Green, g (s)	19.8	19.8	19.8		13.3	13.3	8.6	44.0		12.8	48.2	
Actuated g/C Ratio	0.22	0.22	0.22		0.15	0.15	0.10	0.49		0.14	0.54	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	199	405	344		242	231	167	1706		483	1858	
v/s Ratio Prot	c0.02	0.08					0.03	c0.37		c0.08	0.27	
v/s Ratio Perm	0.09		0.01		c0.09	0.04						
v/c Ratio	0.51	0.35	0.04		0.63	0.26	0.31	0.76		0.59	0.50	
Uniform Delay, d1	30.3	29.6	27.7		36.1	34.0	37.9	18.6		36.2	13.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.4	0.0		4.7	0.4	0.4	3.2		1.9	1.0	
Delay (s)	31.2	30.0	27.7		40.7	34.4	38.3	21.8		38.1	14.3	
Level of Service	С	С	С		D	С	D	С		D	В	
Approach Delay (s)		29.9			36.1			22.4			19.8	
Approach LOS		С			D			С			В	
Intersection Summary												
HCM 2000 Control Delay			24.4	Н	ICM 2000	Level of	Service		С			
HCM 2000 Volume to Cap			0.70									
Actuated Cycle Length (s)			90.0		um of los		200		16.3			
Intersection Capacity Utiliz	ration		69.7%	10	CU Level	of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	7.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		4		*	^
Traffic Vol, veh/h	5	295	230	20	267	133
Future Vol., veh/h	5	295	230	20	267	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		CONTRACTOR O		None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage			0		200	0
Grade, %	0	-	0	_		0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	3	3	3	3
Mymt Flow	6	364	284			
WIVIIIL FIOW	0	304	284	25	330	164
Major/Minor	Minor1	1	Major1		Major2	
Conflicting Flow All	1119	296	0	0	309	0
Stage 1	296					
Stage 2	823	-	-		-	-
Critical Hdwy	6.43	6.23			4.13	
Critical Hdwy Stg 1	5.43	-	-		-	-
Critical Hdwy Stg 2	5.43				4477	
Follow-up Hdwy	3.527		_	-	2.227	_
Pot Cap-1 Maneuver	228	741			1246	
Stage 1	752	-			1240	-
Stage 2	430			uese Ki		
Platoon blocked, %	430	120000		-		
	100	744	Usasanan	-	1010	-
Mov Cap-1 Maneuver	168	741		•	1246	
Mov Cap-2 Maneuver	168	-	-	-	-	-
Stage 1	752	-			-	
Stage 2	316	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	15.7		0		6	
HCM LOS	C		U		U	
IOWI LOO	- C	t see a see a			S MARKET	
		2020				
Minor Lane/Major Mvm	t	NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)				701	1246	
HCM Lane V/C Ratio		-	-	0.528	0.265	-
HCM Control Delay (s)			-	15.7	8.9	-
HCM Lane LOS		-	-	С	Α	-
HCM 95th %tile Q(veh)	THE RESERVE OF THE PERSON NAMED IN			3.1	1.1	435

Intersection						
Int Delay, s/veh	0.4			The state of the s		
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥		1,00	4	13	JUN
Traffic Vol, veh/h	0	15	11	300	286	1
Future Vol, veh/h	0	15	11	300	286	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	
Storage Length	0	-	-	-	_	-
Veh in Median Storage	_			0	0	
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Contract of the Contract of th	2	2	2	2	2	2
Heavy Vehicles, % Mvmt Flow	0	18	13	357	340	1
WWITH FIOW	U	18	13	35/	340	
Major/Minor	Minor2		Major1	N	Major2	
Conflicting Flow All	724	341	342	0	-	0
Stage 1	341					
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	0.22		_	_	-
Critical Hdwy Stg 1	5.42		SOURCE			
Follow-up Hdwy		3.318	2 219	-		-
Pot Cap-1 Maneuver	393	701	1217	-		
	720	101	1217		-	
Stage 1		en contract		_	THE PARTY OF	-
Stage 2	689	•		100		•
Platoon blocked, %	000	704	4047	-	-	-
Mov Cap-1 Maneuver	388	701	1217			•
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	720			-		
Stage 2	680	-	-	-		-
Approach	EB		NB		SB	
HCM Control Delay, s	10.3		0.3		0	
HCM LOS	В		0.0	N. Control	U	
TOW LOG	В					
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1217	-		A STATE OF THE PARTY OF THE PAR	The second second
HCM Lane V/C Ratio		0.011		0.025	•	
HCM Control Delay (s)					EXPERSES	-
HCM Lane LOS		8	0	10.3	•	•
	1	A	Α	В	-	-
HCM 95th %tile Q(veh)	0		0.1		

Movement	Interposition			45°-00'A	SQFV (S)		AYOUR K			NO SECURITOR		ST 100 1000	
Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR	Intersection	0											
Lane Configurations	int Delay, s/ven	3											
Traffic Vol, veh/h	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Future Vol, veh/h Conflicting Peds, #/hr O O O O O O O O O O O O O O O O O O O	Lane Configurations		4			4		ሻ	1			4	
Conflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Vol, veh/h	10	0	78	27	1	15	60	286	10	4	293	4
Conflicting Peds, #/hr	Future Vol, veh/h	10	0	78	27	1	15	60	286	10	4		4
RT Channelized - None - None - None - None - None - None Storage Length None - None - None - None Storage Length	Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0		0
Storage Length	Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Veh in Median Storage, # 0 - 0 <td>RT Channelized</td> <td></td> <td></td> <td>None</td> <td></td> <td></td> <td>None</td> <td></td> <td>466</td> <td>None</td> <td></td> <td></td> <td>None</td>	RT Channelized			None			None		466	None			None
Grade, % - 0 - - 0 - - 0 - - 0 -<	Storage Length	-	-	-	-	-	-	140	-	-	-	-	_
Peak Hour Factor	Veh in Median Storage	e,# -	0			0			0			0	
Heavy Vehicles, % 2 2 2 2 2 2 2 2 2	Grade, %	-	0	-		0	-	-	0		-	0	
Mymt Flow 11 0 88 30 1 17 67 321 11 4 329 4 Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 811 807 331 846 805 327 334 0 0 333 0 0 Stage 1 340 340 - 462 462 - <td>Peak Hour Factor</td> <td>89</td>	Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Major/Minor Minor2 Minor1 Major1 Major2						2		2	2	2	2	2	2
Major/Minor Minor2 Minor1 Major1 Major2	Mvmt Flow	11	0	88	30	1	17	67	321	11	4	329	
Conflicting Flow All 811 807 331 846 805 327 334 0 0 333 0 0 Stage 1 340 340 - 462 462													
Conflicting Flow All 811 807 331 846 805 327 334 0 0 333 0 0 Stage 1 340 340 - 462 462	Major/Minor	Minor2			Minor1			Major1	7		Major2		100
Stage 1 340 340 - 462 462			807			805		Accept Management of the last	0			0	0
Stage 2					(Table 1)		ALC: UNKNOWN	-			000	NAME OF TAXABLE PARTY.	OF THE OWNER, THE
Critical Hdwy 7.12 6.52 6.22 7.12 6.52 6.22 7.12 6.52 6.22 4.12 - 4.12 - - - - 4.12 -	The second secon												
Critical Hdwy Stg 1 6.12 5.52 - 6.12 5.52 -								4 12			4 12		
Critical Hdwy Stg 2 6.12 5.52 - 6.12 5.52				-			-				- 12	/LEE 100	
Follow-up Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 - 2.218 - 2.218 - 500 Cap-1 Maneuver 298 315 711 282 316 714 1225 - 1226 - 500 Stage 1 675 639 - 580 565	, ,												
Pot Cap-1 Maneuver 298 315 711 282 316 714 1225 - 1226 - Stage 1			THE RESIDENCE OF THE PERSON NAMED IN	3.318			3.318	2.218		Beenle	2 218		
Stage 1 675 639 - 580 565			The state of the s										
Stage 2 573 562 - 639 637 - - - - - - - - -				-				-			-		
Platoon blocked, %										10 ACC-14 LA			7000
Mov Cap-1 Maneuver 277 297 711 236 298 714 1225 - 1226 -	The second secon						1000			32		-	
Mov Cap-2 Maneuver 277 297 - 236 298 - </td <td></td> <td>277</td> <td>297</td> <td>711</td> <td>236</td> <td>298</td> <td>714</td> <td>1225</td> <td></td> <td></td> <td>1226</td> <td></td> <td></td>		277	297	711	236	298	714	1225			1226		
Stage 1 638 636 - 548 534 -							-	-	-	-	-		
Stage 2 528 531 - 558 634 -													
Approach EB WB NB SB HCM Control Delay, s 12.1 18.7 1.4 0.1 HCM LOS B C Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1225 - - 604 310 1226 - - HCM Lane V/C Ratio 0.055 - - 0.164 0.156 0.004 - - HCM Control Delay (s) 8.1 - - 12.1 18.7 7.9 0 - HCM Lane LOS A - - B C A A -		528	531	-			-			-	-	-	
HCM Control Delay, s 12.1 18.7 1.4 0.1 HCM LOS B C Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1225 604 310 1226 HCM Lane V/C Ratio 0.055 0.164 0.156 0.004 HCM Control Delay (s) 8.1 - 12.1 18.7 7.9 0 - HCM Lane LOS A - B C A A -													
HCM Control Delay, s 12.1 18.7 1.4 0.1 HCM LOS B C Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1225 604 310 1226 HCM Lane V/C Ratio 0.055 0.164 0.156 0.004 HCM Control Delay (s) 8.1 - 12.1 18.7 7.9 0 - HCM Lane LOS A - B C A A -	Approach	FB	12/4/1		WB	10111	la la s	NR	6 B 5 K		SR		
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1225 - - 604 310 1226 - - HCM Lane V/C Ratio 0.055 - - 0.164 0.156 0.004 - - HCM Control Delay (s) 8.1 - - 12.1 18.7 7.9 0 - HCM Lane LOS A - B C A A -	the to the second the second to the second t	THE PERSON NAMED IN											
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1225 - - 604 310 1226 - - HCM Lane V/C Ratio 0.055 - - 0.164 0.156 0.004 - - HCM Control Delay (s) 8.1 - - 12.1 18.7 7.9 0 - HCM Lane LOS A - - B C A A -								1.7			0.1		
Capacity (veh/h) 1225 604 310 1226 HCM Lane V/C Ratio 0.055 0.164 0.156 0.004 HCM Control Delay (s) 8.1 12.1 18.7 7.9 0 - HCM Lane LOS A - B C A A -					J								
Capacity (veh/h) 1225 604 310 1226 HCM Lane V/C Ratio 0.055 0.164 0.156 0.004 HCM Control Delay (s) 8.1 12.1 18.7 7.9 0 - HCM Lane LOS A - B C A A -	Minor Lang/Major Maria		MDI	NPT	NDD I	EDI - 41	VDL =4	CDI	CDT	CDD	TOTAL PROPERTY.		SOLUMBER OF THE PARTY OF THE PA
HCM Lane V/C Ratio 0.055 0.164 0.156 0.004 HCM Control Delay (s) 8.1 12.1 18.7 7.9 0		H			and the second					SBK			
HCM Control Delay (s) 8.1 12.1 18.7 7.9 0 - HCM Lane LOS A B C A A -		7 921019										13,130	
HCM Lane LOS A B C A A -		STATE OF THE REAL PROPERTY.		-	-				-	-			
HUN JUL MUE VIVEII UZ UN IIO II		1		-	GOOD OF THE PERSON NAMED IN				_				
7.0 0.0 0.0 0.0 0.0 0.0 0.0 0 0 0 0 0 0	ricivi 95tii 76tile Q(ven)		0.2			0.0	0.5	U					

						,		,		*	•
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ሻ	^	7	ሻ	^	7	7	1>		ሻ	†	7
162	1159	15	50	1024	45	97	174	75	20	114	85
162	1159	15	50	1024	45	97	174	75	20	114	85
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
1770	3539	1583	1770	3539	1583	1770	1778		1770	1863	1583
0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
1770	3539	1583	1770	3539	1583	1770	1778		1770	1863	1583
0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
		15	51	1045	46	99	178	77	20	116	87
		7	0	0	23	0	12	0	0	0	76
165		8	51	1045	23	99	243	0	20	116	11
Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
7			3	8		5	2		1	6	
		4			8						6
15.5	72.0	72.0	7.5	64.0	64.0	11.0	24.4		4.1	16.5	16.5
			7.5	64.0	64.0	11.0	24.4		4.1	16.5	16.5
0.12	0.55	0.55	0.06	0.49	0.49	0.08	0.19		0.03	0.13	0.13
5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
211	1960	876	102	1742	779	149	333	ATTO IN	55	236	200
				0.30		c0.06	c0.14		0.01	0.06	
		0.01			0.01						0.01
0.78	0.60	0.01	0.50	0.60	0.03	0.66	0.73		0.36	0.49	0.06
55.6	19.4	13.0	59.4	23.8	17.0	57.7	49.7		61.7	52.8	49.9
1.00	1.00	1.00	1.12	0.49	1.00	1.00	1.00		1.00	1.00	1.00
15.8	1.4	0.0	1.1	1.2	0.1	8.3	6.6		1.5	0.6	0.0
71.4	20.8	13.0	67.5	12.8	17.1	66.1	56.3		63.2	53.4	49.9
E	C	В	Е	В	В	Е	E		E	D	D
	26.9			15.4			59.0			52.9	
	C			В		To high sto	E			D	
		28.2	Н	CM 2000	Level of	Service		C			
ty ratio		0.70									
		130.0	S	um of los	t time (s)			23.0			
on		70.7%				9		С			
		15									
	162 162 1900 5.4 1.00 1.00 0.95 1770 0.95 1770 0.98 165 0 165 Prot 7 15.5 15.5 0.12 5.4 2.0 211 c0.09 0.78 55.6 1.00 15.8 71.4	162 1159 162 1159 1900 1900 5.4 6.3 1.00 0.95 1.00 1.00 0.95 1.00 1770 3539 0.95 1.00 1770 3539 0.98 0.98 165 1183 0 0 0 165 1183 Prot NA 7 4 15.5 72.0 0.12 0.55 5.4 6.3 2.0 4.0 211 1960 c0.09 c0.33 0.78 0.60 55.6 19.4 1.00 1.00 15.8 1.4 71.4 20.8 E C 26.9 C	162 1159 15 162 1159 15 1900 1900 1900 5.4 6.3 6.3 1.00 0.95 1.00 1.00 1.00 0.85 0.95 1.00 1.00 1770 3539 1583 0.95 1.00 1.00 1770 3539 1583 0.98 0.98 0.98 165 1183 15 0 0 7 165 1183 8 Prot NA Perm 7 4 15.5 72.0 72.0 15.5 72.0 72.0 15.5 72.0 72.0 0.12 0.55 0.55 5.4 6.3 6.3 2.0 4.0 4.0 211 1960 876 c0.09 c0.33 0.01 0.78 0.60 0.01 55.6 19.4 13.0 1.00 1.00 15.8 1.4 0.0 71.4 20.8 13.0 E C B 26.9 C	162 1159 15 50 162 1159 15 50 1900 1900 1900 1900 5.4 6.3 6.3 5.7 1.00 0.95 1.00 1.00 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.95 1770 3539 1583 1770 0.95 1.00 1.00 0.95 1770 3539 1583 1770 0.98 0.98 0.98 0.98 165 1183 15 51 0 0 7 0 165 1183 8 51 Prot NA Perm Prot 7 4 3 4 15.5 72.0 72.0 7.5 15.5 72.0 72.0 7.5 0.12 0.55 0.55 0.06 5.4 6.3 6.3 5.7 2.0 4.0 4.0 2.0 211 1960 876 102 c0.09 c0.33 0.03 0.01 0.78 0.60 0.01 0.50 55.6 19.4 13.0 59.4 1.00 1.00 1.00 1.12 15.8 1.4 0.0 1.1 71.4 20.8 13.0 67.5 E C B E 26.9 C 28.2 H by ratio 0.70 130.0 Si port 70.7% 100	162 1159 15 50 1024 162 1159 15 50 1024 1900 1900 1900 1900 1900 5.4 6.3 6.3 5.7 6.6 1.00 0.95 1.00 1.00 0.95 1.00 1.00 0.85 1.00 1.00 0.95 1.00 1.00 0.95 1.00 1770 3539 1583 1770 3539 0.95 1.00 1.00 0.95 1.00 1770 3539 1583 1770 3539 0.98 0.98 0.98 0.98 0.98 165 1183 15 51 1045 0 0 7 0 0 165 1183 8 51 1045 Prot NA Perm Prot NA 7 4 3 8 4 15.5 72.0 72.0 7.5 64.0 15.5 72.0 72.0 7.5 64.0 0.12 0.55 0.55 0.06 0.49 5.4 6.3 6.3 5.7 6.6 2.0 4.0 4.0 2.0 4.0 211 1960 876 102 1742 c0.09 c0.33 0.01 0.78 0.60 0.01 0.50 0.60 55.6 19.4 13.0 59.4 23.8 1.00 1.00 1.00 1.12 0.49 15.8 1.4 0.0 1.1 1.2 71.4 20.8 13.0 67.5 12.8 E C B E B 26.9 15.4 C B	162 1159 15 50 1024 45 162 1159 15 50 1024 45 1900 1900 1900 1900 1900 1900 5.4 6.3 6.3 5.7 6.6 6.6 1.00 0.95 1.00 1.00 0.95 1.00 1.00 1.00 0.85 1.00 1.00 0.95 1.00 1.00 1.00 0.85 1.00 1.00 0.95 1.00 1.70 3539 1583 1770 3539 1583 0.95 1.00 1.00 0.95 1.00 1.00 1770 3539 1583 1770 3539 1583 0.98 0.98 0.98 0.98 0.98 0.98 0.98 165 1183 15 51 1045 46 0 0 7 0 0 23 165 1183 8 51 1045 23 Prot NA Perm Prot NA Perm 7 4 3 8 15.5 72.0 72.0 7.5 64.0 64.0 15.5 72.0 72.0 7.5 64.0 64.0 15.5 72.0 72.0 7.5 64.0 64.0 0.12 0.55 0.55 0.06 0.49 0.49 5.4 6.3 6.3 5.7 6.6 6.6 2.0 4.0 4.0 2.0 4.0 4.0 211 1960 876 102 1742 779 0.09 0.33 0.03 0.30 0.01 0.01 0.01 0.78 0.60 0.01 0.50 0.60 0.03 55.6 19.4 13.0 59.4 23.8 17.0 1.00 1.00 1.00 1.12 0.49 1.00 15.8 1.4 0.0 1.1 1.2 0.4 71.4 20.8 13.0 67.5 12.8 17.1 E C B E B B 26.9 15.4 C B E B B 26.9 15.4 C B E B B B 15.4 C B Sum of lost time (s) 1CU Level of Service	162 1159 15 50 1024 45 97 162 1159 15 50 1024 45 97 1900 1900 1900 1900 1900 1900 1900 5.4 6.3 6.3 5.7 6.6 6.6 4.5 1.00 0.95 1.00 1.00 0.95 1.00 1.00 1.00 1.00 0.85 1.00 1.00 0.95 1.00 1.00 0.95 1.770 3539 1583 1770 3539 1583 1770 0.95 1.00 1.00 0.95 1770 3539 1583 1770 3539 1583 1770 0.95 1.00 1.00 0.95 1770 3539 1583 1770 3539 1583 1770 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98 165 1183 15 51	162 1159 15 50 1024 45 97 174 162 1159 15 50 1024 45 97 174 1900 1900 1900 1900 1900 1900 1900 1900	162 1159 15 50 1024 45 97 174 75 162 1159 15 50 1024 45 97 174 75 1900 1900 1900 1900 1900 1900 1900 1900	162	162

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	56	1156	42	26	1009	196	46	104	22	273	61	64
Future Volume (vph)	56	1156	42	26	1009	196	46	104	22	273	61	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.97	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1806		1681	1715	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.97	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1806		1681	1715	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	1270	46	29	1109	215	51	114	24	300	67	70
RTOR Reduction (vph)	0	0	24	0	0	73	0	4	0	0	0	60
Lane Group Flow (vph)	62	1270	22	29	1109	142	0	185	0	183	184	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	1 01111
Permitted Phases			4			8					Address of the	6
Actuated Green, G (s)	7.9	63.4	63.4	4.7	60.5	60.5		17.7		18.7	18.7	18.7
Effective Green, g (s)	7.9	63.4	63.4	4.7	60.5	60.5		17.7		18.7	18.7	18.7
Actuated g/C Ratio	0.06	0.49	0.49	0.04	0.47	0.47		0.14		0.14	0.14	0.14
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	107	1725	772	63	1646	736		245		241	246	227
v/s Ratio Prot	c0.04	c0.36		0.02	0.31			c0.10		c0.11	0.11	
v/s Ratio Perm			0.01			0.09		in The				0.01
v/c Ratio	0.58	0.74	0.03	0.46	0.67	0.19		0.75		0.76	0.75	0.04
Uniform Delay, d1	59.4	26.6	17.3	61.4	27.1	20.4		54.1		53.5	53.4	48.0
Progression Factor	1.04	1.10	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	2.4	0.1	1.9	2.2	0.6		11.0		11.5	10.3	0.0
Delay (s)	65.9	31.7	17.4	63.3	29.3	21.0		65.1		65.1	63.8	48.0
Level of Service	E	C	В	E	C	C		E		E	Е	D
Approach Delay (s)		32.7			28.7			65.1			61.8	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			36.7	HC	CM 2000	Level of S	ervice		D	BEST AND A		
HCM 2000 Volume to Capaci	ty ratio		0.75									
Actuated Cycle Length (s)			130.0	Su	m of lost	time (s)			25.5			
Intersection Capacity Utilization	on		74.5%			f Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	†	7		4	7	ሻ	† ‡		ሻሻ	† ‡	
Traffic Volume (vph)	145	179	64	55	109	505	41	1307	29	279	665	68
Future Volume (vph)	145	179	64	55	109	505	41	1307	29	279	665	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1832	1583	1770	3528		3433	3490	
Flt Permitted	0.40	1.00	1.00		0.83	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	751	1863	1583		1545	1583	1770	3528		3433	3490	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	195	70	60	118	549	45	1421	32	303	723	74
RTOR Reduction (vph)	0	0	51	0	0	331	0	2	0	0	7	0
Lane Group Flow (vph)	158	195	19	0	178	218	45	1451	0	303	790	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	24.5	24.5	24.5		17.1	17.1	8.9	39.6		12.5	43.2	
Effective Green, g (s)	24.5	24.5	24.5		17.1	17.1	8.9	39.6		12.5	43.2	With the
Actuated g/C Ratio	0.27	0.27	0.27		0.19	0.19	0.10	0.44		0.14	0.48	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	255	507	430		293	300	175	1552		476	1675	
v/s Ratio Prot	c0.03	0.10	.00				0.03	c0.41		c0.09	0.23	
v/s Ratio Perm	0.14	0.10	0.01		0.12	c0.14						NOTE:
v/c Ratio	0.62	0.38	0.04		0.61	0.73	0.26	0.94		0.64	0.47	
Uniform Delay, d1	28.5	26.6	24.1		33.4	34.2	37.5	24.0		36.6	15.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.4	0.0		3.0	7.9	0.3	11.9		2.8	1.0	
Delay (s)	31.7	27.0	24.2		36.4	42.2	37.8	35.9		39.4	16.7	
Level of Service	C	C	C		D	D	D	D		D	В	
Approach Delay (s)		28.3			40.8			35.9			22.9	
Approach LOS		C			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			32.2	Н	CM 2000	Level of	Service		С			THE REAL PROPERTY.
HCM 2000 Volume to Capac	city ratio		0.82		2111 2000	_0,0,0,0	23,1,00					
Actuated Cycle Length (s)	J. J. Tatio		90.0	S	um of los	t time (s)			16.3			
Intersection Capacity Utiliza	tion		89.3%			of Service			E			
Analysis Period (min)			15		23 23701	2. 0011100			_			
c Critical Lane Group												Part of the San

Intersection						
Int Delay, s/veh	11.5					
Movement	WBL	WBR	NBT	NBR	CDI	CDT
THE RESERVE OF THE PERSON NAMED IN COLUMN 2 IS NOT THE PERSON NAME	WDL	VVDR	TONI	NBK	SBL	SBT
Lane Configurations		400		^		100
Traffic Vol, veh/h	6	408	339	9	376	169
Future Vol, veh/h	6	408	339	9	376	169
Conflicting Peds, #/hr	0	0	0	_ 0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None				None
Storage Length	0			-	200	•
Veh in Median Storage	- 7		0		•	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	458	381	10	422	190
Major/Minor I	Minor1		Major1	and the second	Major2	955.076
Conflicting Flow All	1421	386	0	0	391	0
Stage 1	386	-	-		-	-
Stage 2	1035	#				
Critical Hdwy	6.42	6.22	General Control	-	4.12	-
	5.42					•
Critical Hdwy Stg 1		-	-	-		-
Critical Hdwy Stg 2	5.42	-			-	
Follow-up Hdwy	3.518		-	-	2.218	-
Pot Cap-1 Maneuver	150	662			1168	-
Stage 1	687	-	-	-	-	-
Stage 2	342				-	
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	662			1168	
Mov Cap-2 Maneuver	96	-	-		-	-
Stage 1	687					
Stage 2	218	-	-	-	-	-
		1-260				
Approach	WB		NB		SB	S. Parille
HCM Control Delay, s	27.3		0		6.8	
HCM LOS	D	Normal Services		STATES OF		00000000
Minor Lane/Major Mvm	t	NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)				610	1168	
HCM Lane V/C Ratio		-	-	0.763		-
HCM Control Delay (s)			-		9.8	
HCM Lane LOS		-	-	D	A	-
HCM 95th %tile Q(veh)					1.7	
	THE RESERVE AND ADDRESS OF THE PARTY OF THE			THE REAL PROPERTY.	Service Control	

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		MUL	4	100	ODK
Traffic Vol, veh/h	2	8	15	412	380	5
Future Vol, veh/h	2	8	15	412	380	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None	riee -	TAX BOARD	riee -	THE RESERVE
Storage Length	0	None -		None -		None -
Veh in Median Storage				0	0	
	STREET, SQUARE					
Grade, %	0	- 00	- 00	0	0	- 00
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	17	468	432	6
Major/Minor	Minor2		Major1	٨	//ajor2	
	937	435	438	0		0
Conflicting Flow All				and the same of the same of		
Stage 1	435				-	
Stage 2	502	-		-	-	-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318				-
Pot Cap-1 Maneuver	294	621	1122			
Stage 1	653	_	-	-	-	-
Stage 2	608					
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	288	621	1122			
Mov Cap-2 Maneuver	288	-	-	-	-	-
Stage 1	653					
Stage 2	596	-	_	_	-	-
Oldgo Z	000					NAME OF
		Value 1955				
Approach	EB		NB		SB	
HCM Control Delay, s	12.3		0.3		0	
HCM LOS	В					
						CDD
Minor Long Maiss 14	4	MOL	NOT	EDI-4		
Minor Lane/Major Mvm	ıt	NBL	Color Colored	EBLn1	SBT	SBR
Capacity (veh/h)	it	1122		504	SBT -	- SBR
Capacity (veh/h) HCM Lane V/C Ratio		1122 0.015	-	504 0.023	Carlotte and Control	national transmiss
Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s)		1122 0.015 8.3	- - 0	504 0.023 12.3		
Capacity (veh/h) HCM Lane V/C Ratio		1122 0.015	-	504 0.023	-	-

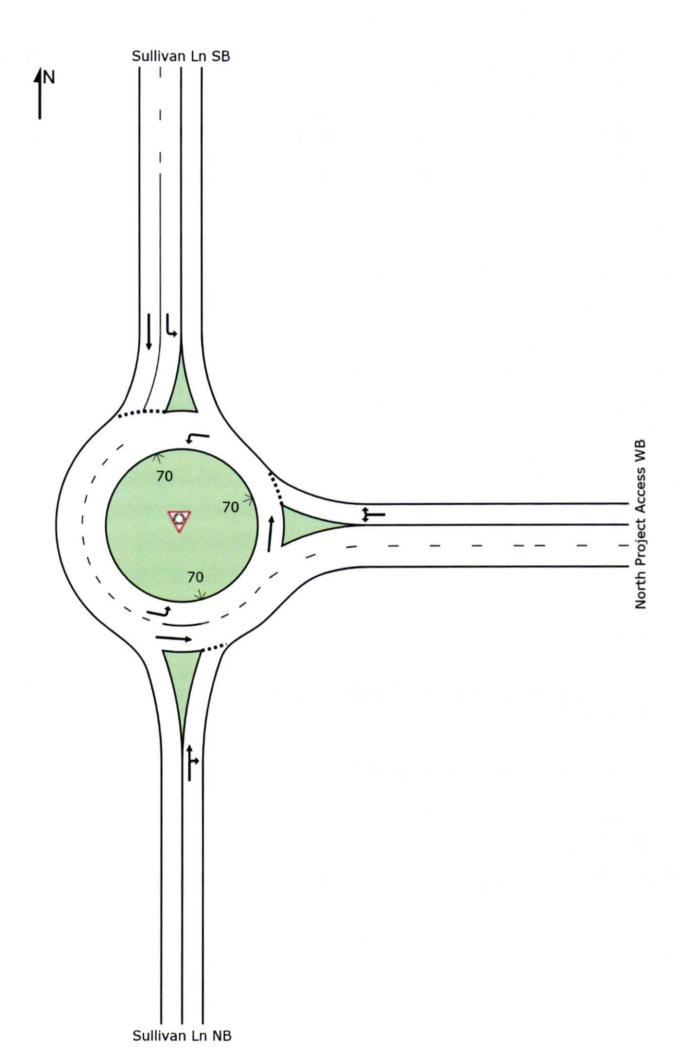
Int Delay, s/veh	Intersection	63.53								\$ 50 B			
Traffic Vol, veh/h		4								The state of the s		arcontractors.	
Lane Configurations	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	Lane Configurations		4			4		ሻ	1				
Future Vol, veh/h Conflicting Peds, #hr O O O O O O O O O O O O O O O O O O O		21	0	150	30	1	4	55	402	22	10	368	10
Conflicting Peds, #/hr		21	the same of the sa			1	4						
Sign Control Stop Stop		0	0	0	0		0		-				
RT Channelized - None - None - None - None - None - None Storage Length None - None - None - None Storage Length	Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free			Street, Square, Square		
Storage Length	RT Channelized	SALES AND ADDRESS.	AND DESCRIPTION OF THE PERSON NAMED IN		OF STREET	STATE OF THE PARTY NAMED IN					NAME OF TAXABLE PARTY.	STATE SALL DE	
Grade, % - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -	Storage Length	-		-	-			140	-		-	-	-
Peak Hour Factor 95 96 2 2 2 2 2		e,# -	0			0		STREET, SQUARE, SQUARE	0			0	
Heavy Vehicles, % 2 2 2 2 2 2 2 2 2	Grade, %	-	0		-	0		-	0	-	-	0	-
Major/Minor Minor2 Minor1 Major1 Major2	Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Major/Minor Minor2 Minor1 Major1 Major2	Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Conflicting Flow All 967 976 393 1044 970 435 398 0 0 446 0 0	Mvmt Flow	22	0	158	32	1	4	58	423	23	11	387	11
Conflicting Flow All 967 976 393 1044 970 435 398 0 0 446 0 0													
Stage 1	Major/Minor	Minor2			Minor1			Major1			Major2		
Stage 1	Conflicting Flow All	967	976	393	1044	970	435	398	0	0	446	0	0
Critical Hdwy 7.12 6.52 6.22 7.12 6.52 6.22 7.12 6.52 6.22 4.12 - 4.12 - - - - 4.12 - - - 4.12 -	Stage 1	414	414		551	551			-		-		OTHER PROPERTY.
Critical Hdwy Stg 1 6.12 5.52 - 6.12 5.52	Stage 2	553	562	-	493	419	-	-	-		-	-	
Critical Hdwy Stg 2 6.12 5.52 - 6.12 5.52	Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12			4.12		
Follow-up Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 - 2.218 - 2.218 - 2.218 Pot Cap-1 Maneuver 234 251 656 207 253 621 1161 - 1114 - 1114 - Stage 1 616 593 - 519 515	Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-		-	-	
Pot Cap-1 Maneuver 234 251 656 207 253 621 1161 - 1114 - Stage 1 616 593 - 519 515	Critical Hdwy Stg 2	6.12	5.52		6.12	5.52							
Stage 1 616 593 - 519 515 -	Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218			2.218		
Stage 2 517 510 - 558 590	Pot Cap-1 Maneuver	234	251	656	207	253	621	1161			1114		
Platoon blocked, % Mov Cap-1 Maneuver 221 235 656 150 237 621 1161 - 1114 - 1 Mov Cap-2 Maneuver 221 235 - 150 237	Stage 1	616	593	-	519	515	-	-	-	-	-	-	
Mov Cap-1 Maneuver 221 235 656 150 237 621 1161 - - 1114 - - Mov Cap-2 Maneuver 221 235 - 150 237 -	Stage 2	517	510		558	590							
Mov Cap-2 Maneuver 221 235 - 150 237 - </td <td>Platoon blocked, %</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td>-</td>	Platoon blocked, %									-		-	-
Stage 1 585 585 - 493 489	Mov Cap-1 Maneuver	221	235	656	150	237	621	1161			1114		
Stage 2	Mov Cap-2 Maneuver			-	150		-	-		-	-	-	-
Approach EB WB NB SB HCM Control Delay, s 15.3 32.8 0.9 0.2 HCM LOS C D Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1161 528 166 1114 HCM Lane V/C Ratio 0.05 0.341 0.222 0.009 HCM Control Delay (s) 8.3 - 15.3 32.8 8.3 0 - HCM Lane LOS A - C D A A -	THE RESERVE OF THE PARTY OF THE												
HCM Control Delay, s 15.3 32.8 0.9 0.2 HCM LOS C D Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1161 528 166 1114 HCM Lane V/C Ratio 0.05 0.341 0.222 0.009 HCM Control Delay (s) 8.3 15.3 32.8 8.3 0 - HCM Lane LOS A - C D A A -	Stage 2	487	485	-	418	582	-	-	-	-	-	-	-
HCM Control Delay, s 15.3 32.8 0.9 0.2 HCM LOS C D Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1161 528 166 1114 HCM Lane V/C Ratio 0.05 0.341 0.222 0.009 HCM Control Delay (s) 8.3 15.3 32.8 8.3 0 - HCM Lane LOS A - C D A A -													
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1161 - - 528 166 1114 - - HCM Lane V/C Ratio 0.05 - - 0.341 0.222 0.009 - - HCM Control Delay (s) 8.3 - - 15.3 32.8 8.3 0 - HCM Lane LOS A - C D A A -	Approach	EB			WB			NB			SB	7	
Minor Lane/Major Mvmt	HCM Control Delay, s	15.3			32.8			0.9			0.2		
Capacity (veh/h) 1161 - - 528 166 1114 - - HCM Lane V/C Ratio 0.05 - - 0.341 0.222 0.009 - - HCM Control Delay (s) 8.3 - - 15.3 32.8 8.3 0 - HCM Lane LOS A - C D A A -	HCM LOS	С			D								
Capacity (veh/h) 1161 - - 528 166 1114 - - HCM Lane V/C Ratio 0.05 - - 0.341 0.222 0.009 - - HCM Control Delay (s) 8.3 - - 15.3 32.8 8.3 0 - HCM Lane LOS A - C D A A -													
HCM Lane V/C Ratio 0.05 0.341 0.222 0.009 HCM Control Delay (s) 8.3 15.3 32.8 8.3 0		nt		NBT	NBR				SBT	SBR			
HCM Control Delay (s) 8.3 15.3 32.8 8.3 0 - HCM Lane LOS A C D A A -	Capacity (veh/h)												
HCM Lane LOS A C D A A -	HCM Lane V/C Ratio			-	-				-	-			
				-						-			
HCM 95th %tile Q(veh) 0.2 1.5 0.8 0	HCM Lane LOS			-					Α	-			
	HCM 95th %tile Q(veh))	0.2			1.5	0.8	0					

	•	→	•	•	←	•	4	†	~	-	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	7	^	7	7	4		ħ	†	7
Traffic Volume (vph)	168	1614	55	45	1281	52	96	260	71	30	90	105
Future Volume (vph)	168	1614	55	45	1281	52	96	260	71	30	90	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1803		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1803		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	173	1664	57	46	1321	54	99	268	73	31	93	108
RTOR Reduction (vph)	0	0	27	0	0	29	0	8	0	0	0	91
Lane Group Flow (vph)	173	1664	30	46	1321	25	99	333	0	31	93	17
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4	1 01111	3	8		5	2		1	6	
Permitted Phases			4			8	TO THE					6
Actuated Green, G (s)	16.2	68.2	68.2	7.3	59.3	59.3	11.0	27.7		4.8	20.5	20.5
Effective Green, g (s)	16.2	68.2	68.2	7.3	59.3	59.3	11.0	27.7		4.8	20.5	20.5
Actuated g/C Ratio	0.12	0.52	0.52	0.06	0.46	0.46	0.08	0.21		0.04	0.16	0.16
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	220	1856	830	99	1614	722	149	384		65	293	249
v/s Ratio Prot	c0.10	c0.47	000	0.03	0.37	,	c0.06	c0.18		0.02	0.05	
v/s Ratio Perm	00.10	00.11	0.02	1.00		0.02						0.01
v/c Ratio	0.79	0.90	0.04	0.46	0.82	0.03	0.66	0.87		0.48	0.32	0.07
Uniform Delay, d1	55.2	27.7	15.0	59.5	30.7	19.5	57.7	49.4		61.4	48.5	46.6
Progression Factor	1.00	1.00	1.00	0.77	1.54	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.6	7.3	0.1	0.8	3.2	0.1	8.3	17.7		2.0	0.2	0.0
Delay (s)	70.8	35.0	15.1	46.8	50.4	19.6	66.1	67.1		63.4	48.8	46.7
Level of Service	E	D	В	D	D	В	E	E		E	D	D
Approach Delay (s)		37.7		-	49.1			66.9			49.7	
Approach LOS		D			D			Е			D	
Intersection Summary				(9)								
HCM 2000 Control Delay			45.7	Н	CM 2000	Level of	Service		D			
HCM 2000 Volume to Capa	city ratio		0.92									
Actuated Cycle Length (s)			130.0	S	um of los	t time (s)			23.0			
Intersection Capacity Utiliza	ition		90.9%			of Service)		E			and the second
Analysis Period (min)			15									
c Critical Lane Group												

	•	→	•	•	-	•	4	1	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	ř	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	71	1609	35	40	1151	271	52	137	38	268	105	175
Future Volume (vph)	71	1609	35	40	1151	271	52	137	38	268	105	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	Busie	0.95	0.98	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1800		1681	1732	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1800		1681	1732	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	1694	37	42	1212	285	55	144	40	282	111	184
RTOR Reduction (vph)	0	0	21	0	0	84	0	6	0	0	0	142
Lane Group Flow (vph)	75	1694	16	42	1212	201	0	233	0	195	198	42
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	Cilii
Permitted Phases			4	NEW SE		8						6
Actuated Green, G (s)	8.7	56.8	56.8	6.6	55.0	55.0		21.3		19.8	19.8	19.8
Effective Green, g (s)	8.7	56.8	56.8	6.6	55.0	55.0		21.3		19.8	19.8	19.8
Actuated g/C Ratio	0.07	0.44	0.44	0.05	0.42	0.42		0.16		0.15	0.15	0.15
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	118	1546	691	89	1497	669		294		256	263	241
v/s Ratio Prot	c0.04	c0.48		0.02	0.34			c0.13		c0.12	0.11	
v/s Ratio Perm			0.01			0.13					STATE	0.03
v/c Ratio	0.64	1.10	0.02	0.47	0.81	0.30		0.79		0.76	0.75	0.17
Uniform Delay, d1	59.1	36.6	20.8	60.0	32.9	24.8		52.2		52.8	52.8	48.0
Progression Factor	1.39	0.69	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	49.4	0.0	1.4	4.8	1.1		12.8		11.4	10.3	0.1
Delay (s)	86.5	74.8	20.9	61.4	37.7	25.9		65.0		64.2	63.1	48.1
Level of Service	F	E	C	E	D	C		E		E	E	D
Approach Delay (s)		74.1			36.2			65.0			58.7	The Section
Approach LOS		Е			D			Е			Е	
Intersection Summary												
HCM 2000 Control Delay			57.4	Н	CM 2000	Level of S	Service		Е			
HCM 2000 Volume to Capacit	y ratio		0.95									
Actuated Cycle Length (s)	Herrie		130.0	Su	m of lost	time (s)			25.5			
Intersection Capacity Utilization	n		89.9%			f Service		74-1-1	Е			
Analysis Period (min)			15		4277							259.86
c Critical Lane Group												

	•	→	•	•	—	•	4	†	~	-	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7		4	7	*	† ‡		ሻሻ	41	
Traffic Volume (vph)	50	154	25	42	178	298	43	350	43	794	1253	124
Future Volume (vph)	50	154	25	42	178	298	43	350	43	794	1253	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1827	1568	1752	3444		3400	3457	
FIt Permitted	0.29	1.00	1.00		0.90	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	527	1845	1568		1669	1568	1752	3444	1	3400	3457	
Peak-hour factor, PHF	0.88	0.86	0.88	0.85	0.87	0.80	0.88	0.88	0.83	0.82	0.88	0.88
Adj. Flow (vph)	57	179	28	49	205	372	49	398	52	968	1424	141
RTOR Reduction (vph)	0	0	20	0	0	296	0	11	0	0	6	0
Lane Group Flow (vph)	57	179	8	0	254	77	49	439	0	968	1559	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	24.6	24.6	24.6		18.5	18.5	3.3	20.3		31.7	48.7	
Effective Green, g (s)	24.6	24.6	24.6		18.5	18.5	3.3	20.3		31.7	48.7	
Actuated g/C Ratio	0.27	0.27	0.27		0.21	0.21	0.04	0.23		0.35	0.54	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	187	504	428		343	322	64	776		1197	1870	
v/s Ratio Prot	0.01	c0.10					c0.03	0.13		0.28	c0.45	
v/s Ratio Perm	0.07		0.00		c0.15	0.05						
v/c Ratio	0.30	0.36	0.02		0.74	0.24	0.77	0.57		0.81	0.83	
Uniform Delay, d1	25.3	26.3	23.9		33.5	29.9	43.0	30.9		26.4	17.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3	0.0		7.9	0.3	37.9	3.0		4.1	4.5	
Delay (s)	25.6	26.6	23.9		41.4	30.1	80.8	33.9		30.5	21.8	
Level of Service	С	С	С		D	С	F	С		С	С	
Approach Delay (s)		26.1			34.7			38.5			25.1	
Approach LOS		С			С			D			С	
Intersection Summary							T Y					
HCM 2000 Control Delay			28.4	Н	CM 2000	Level of	Service		С			
HCM 2000 Volume to Cap	acity ratio		0.79									
Actuated Cycle Length (s)			90.0	S	um of los	t time (s)			16.3			
Intersection Capacity Utiliz	ation		76.6%	IC	CU Level	of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												No. 2 Sept

Intersection						
Int Delay, s/veh	1945.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WDL	WDI	TOVI	NOR	SDL	
Traffic Vol, veh/h	75	473	81	157		
Future Vol, veh/h	75	473	81	157 157	792 792	275
Conflicting Peds, #/hr	0	4/3	0	157		275
		The state of the s		AND DESCRIPTION OF	0	0
Sign Control RT Channelized	Stop	Stop	Free	Free	Free	Free
	-	None		None	200	
Storage Length	0	-	-	-	200	-
Veh in Median Storage			0	•		0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	80	84	75	80	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	591	96	209	990	324
Major/Minor	Minor1	State of	Majort		Major	- T
			Major1		Major2	_
Conflicting Flow All	2505	201	0	0	306	0
Stage 1	201	-			•	•
Stage 2	2304		-	-		-
Critical Hdwy	6.42	6.22			4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~31	840			1255	
Stage 1	833	-		-	-	-
Stage 2	~ 80					
Platoon blocked, %				-		-
Mov Cap-1 Maneuver	~7	840			1255	
Mov Cap-2 Maneuver	~ 7	-	-	_	-	
Stage 1	833					
Stage 2	~ 17			31811	-	
Glaye 2	- 11	12/25/25		-	-	-
Approach	WB		NB		SB	
HCM Control Delay, \$ 6	6478.2		0		13.3	
HCM LOS	F		X			
Ballande belonen	BHIS					
		MAN AND AND ADDRESS OF THE PARTY OF THE PART		NAME OF STREET	Maria Salah	a water and
Minor Lane/Major Mvm	nt	NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)				46	1255	
HCM Lane V/C Ratio		-	-1	5.027		-
HCM Control Delay (s)				478.2	17.6	
HCM Lane LOS		-	-	F	С	-
HCM 95th %tile Q(veh)				83.8	8.8	
	general sur	None Manual				
Notes						
~: Volume exceeds cap	pacity	\$: De	lay exce	eeds 30	00s	+: Comp



MOVEMENT SUMMARY

Site: Sullivan Ln/North Project Access

Existing Plus Project Conditions AM Peak Hour Roundabout

Mov	OD	Demand	Flower	Dog	Average	Level of	OFO/ Deals	- 10	D	Est.	
ID	Mov	Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Service	95% Back of Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	Sullivan Ln	NB									
8	T1	441	2.0	0.671	16.4	LOSC	3.8	97.7	0.63	0.69	29.3
18	R2	100	2.0	0.671	16.4	LOS C	3.8	97.7	0.63	0.69	28.7
Approa	ich	541	2.0	0.671	16.4	LOS C	3.8	97.7	0.63	0.69	29.2
East: N	lorth Project	Access WB									
1	L2	48	2.0	0.378	10.0	LOS B	1.6	41.2	0.58	0.58	31.4
16	R2	219	2.0	0.378	10.0	LOS B	1.6	41.2	0.58	0.58	30.8
Approa	ich	267	2.0	0.378	10.0	LOS B	1.6	41.2	0.58	0.58	30.9
North:	Sullivan Ln S	SB									
7	L2	444	2.0	0.421	8.0	LOSA	2.3	58.0	0.22	0.10	30.8
4	T1	716	2.0	0.679	13.7	LOS B	6.1	155.2	0.36	0.17	30.3
Approa	ch	1160	2.0	0.679	11.5	LOS B	6.1	155.2	0.31	0.14	30.5
All Vehi	icles	1968	2.0	0.679	12.7	LOSB	6.1	155.2	0.43	0.35	30.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, January 04, 2019 4:55:17 PM SIDRA INTERSECTION 6.0.24.4877

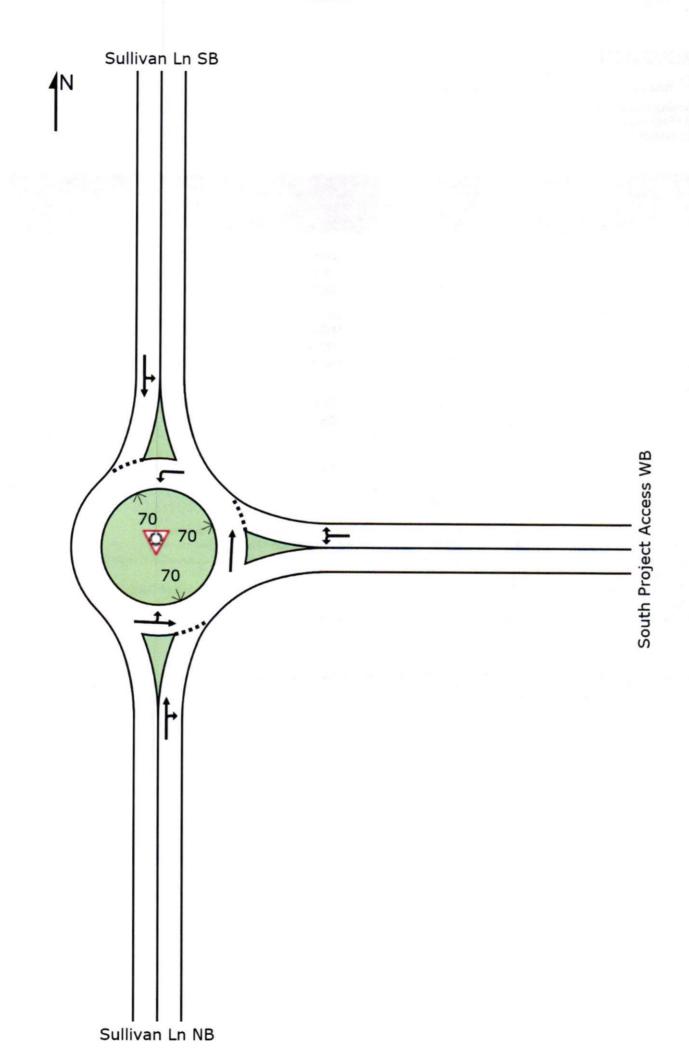
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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\EPP-AM.sip6

8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

SIDRA INTERSECTION 6

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥	- EUN	1100	4	100	ODIN
Traffic Vol, veh/h	5	8	2	453	648	5
Future Vol, veh/h	5	8	2	453	648	5
Conflicting Peds, #/hr	0	0	0	0	040	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Slop -	CONTRACTOR OF THE PERSON NAMED IN				None
The state of the s			•			
Storage Length	0	-		-	-	-
Veh in Median Storage	the contract of the contract of	-		0	0	
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	50	82	83	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	9	4	552	781	6
Major/Minor	Minor2	Shirt	Major1	Same of	Major2	
Conflicting Flow All	1344	784	786	0	· ·	0
Stage 1	784	104	700	-		-
product to the second of the s						
Stage 2	560	- 0.00	140	-	-	_
Critical Hdwy	6.42	6.22	4.12			•
Critical Hdwy Stg 1	5.42	•		-	-	-
Critical Hdwy Stg 2	5.42			-		
Follow-up Hdwy		3.318		-	-	-0
Pot Cap-1 Maneuver	167	393	833			ter de
Stage 1	450	-	-	-	-	-
Stage 2	572					
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	166	393	833			
Mov Cap-2 Maneuver		-	-	-	-	-
Stage 1	450					
Stage 2	568	-			_	-
Olage 2	500		CONTRACT.		STEV	- TEN
				and the second		C. Selection
Approach	EB		NB		SB	
HCM Control Delay, s	19.8		0.1		0	
HCM LOS	С					
Minor Lane/Major Mvn	nt	NBL	NOT	EBLn1	SBT	SBR
	IL.					THE RESIDENCE OF THE PERSON
Capacity (veh/h)		833	•			
HCM Lane V/C Ratio		0.005		0.058	-	-
HOMO		03	0	19.8		-
HCM Control Delay (s		9.3	0			
HCM Control Delay (s HCM Lane LOS HCM 95th %tile Q(veh	•	9.3 A 0	A	С	-	-



MOVEMENT SUMMARY

Site: Sullivan Ln/South Project Access

Existing Plus Project Conditions AM Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	Sullivan Ln										
8	T1	414	2.0	0.706	17.1	LOS C	6.3	159.5	0.72	0.68	29.0
18	R2	195	2.0	0.706	17.1	LOS C	6.3	159.5	0.72	0.68	28.4
Approa	ich	608	2.0	0.706	17.1	LOS C	6.3	159.5	0.72	0.68	28.8
East: S	outh Project	Access WB									
1	L2	96	2.0	0.297	8.5	LOSA	1.2	29.8	0.53	0.51	31.5
16	R2	120	2.0	0.297	8.5	LOSA	1.2	29.8	0.53	0.51	30.9
Approa	ich	216	2.0	0.297	8.5	LOSA	1.2	29.8	0.53	0.51	31.2
North:	Sullivan Ln S	SB									
7	L2	247	2.0	0.761	17.8	LOS C	7.7	196.1	0.61	0.38	28.2
4	T1	518	2.0	0.761	17.8	LOS C	7.7	196.1	0.61	0.38	28.2
Approa	ich	764	2.0	0.761	17.8	LOS C	7.7	196.1	0.61	0.38	28.2
All Veh	icles	1588	2.0	0.761	16.3	LOSC	7.7	196.1	0.64	0.51	28.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\EPP-AM.sip6

8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

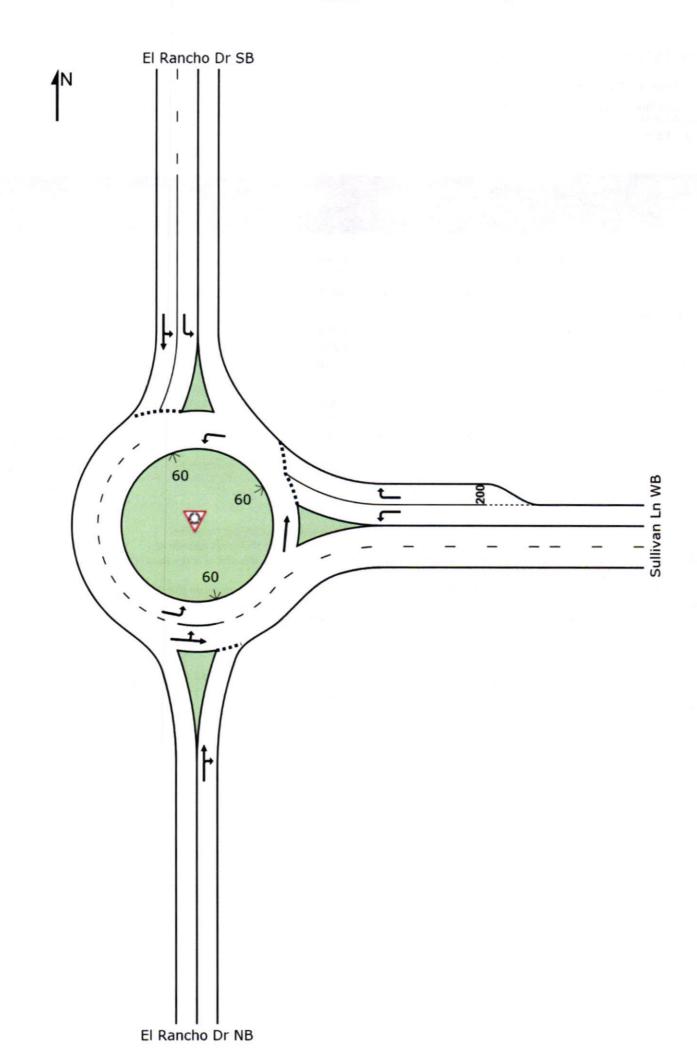
SIDRA INTERSECTION 6

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		*	4			4	
Traffic Vol, veh/h	10	0	35	4	0	1	77	501	29	6	511	27
Future Vol, veh/h	10	0	35	4	0	1	77	501	29	6	511	27
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			
Storage Length	-	_	-	-	-		140	-	-	-		-
Veh in Median Storage	e,# -	0			0			0			0	
Grade, %	-	0	-		0		-	0	-	-	0	
Peak Hour Factor	83	86	86	86	86	86	86	81	86	75	83	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mymt Flow	12	0	41	5	0	1	90	619	34	8	616	32
PROPERTY OF THE PROPERTY OF TH								0.0			010	U.
Major/Minor	Minor2			Minor1			Major1		N	//ajor2		1995A-27
Conflicting Flow All	1463	1479	632	1482	1478	635	648	0	0	652	0	0
Stage 1	648	648	-	814	814	000	040	-	-	002	-	0
Stage 2	815	831	-	668	664			-				
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	E A SERVICE AND		4.12		
Critical Hdwy Stg 1	6.12	5.52	0.22	6.12	5.52	0.22	4.12	-		4.12	•	
Critical Hdwy Stg 1	6.12	5.52		6.12	5.52	0555500	Yk stur		SHELLER	•	•	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218			2.218		
Pot Cap-1 Maneuver	107	126	480	103	126	478	938	-				-
	459	466		372	391	4/8	938	•	-	935		
Stage 1	371	384		2000		-	-	-		-	-	-
Stage 2 Platoon blocked, %	3/1	384	-	448	458							
	00	110	400	00	140	470	000	Inches	-	005	-	-
Mov Cap-1 Maneuver	98	112	480	86	112	478	938		•	935		
Mov Cap-2 Maneuver	98	112	-	86	112	-	-	-	-	-	-	-
Stage 1	415	460		336	353			1000				
Stage 2	335	347	-	405	452	-	-	-	-		-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	22.9			42			1.1			0.1		
HCM LOS	С			Е								
Minor Lane/Major Mvm	nt	NBL	NBT	NBR	EBLn1V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		938			254	103	935					
HCM Lane V/C Ratio		0.095	-		0.208			-	-			
HCM Control Delay (s)		9.2			22.9	42	8.9	0				
HCM Lane LOS		A	-	-	C	E	A	A	-			
HCM 95th %tile Q(veh))	0.3			0.8	0.2	0					
7.511							11/2					

	۶	→	•	•	←	•	4	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7	ሻ	1>		ሻ	^	7
Traffic Volume (vph)	153	723	59	82	1603	24	60	134	102	23	290	171
Future Volume (vph)	153	723	59	82	1603	24	60	134	102	23	290	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1740		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1740		1770	1863	1583
Peak-hour factor, PHF	0.83	0.93	0.92	0.85	0.94	0.94	0.94	0.82	0.80	0.94	0.91	0.89
Adj. Flow (vph)	184	777	64	96	1705	26	64	163	128	24	319	192
RTOR Reduction (vph)	0	0	33	0	0	14	0	22	0	0	0	142
Lane Group Flow (vph)	184	777	31	96	1705	12	64	269	0	24	319	50
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8		Name of				6
Actuated Green, G (s)	13.8	63.9	63.9	11.1	61.2	61.2	7.9	29.6		3.5	24.2	24.2
Effective Green, g (s)	13.8	63.9	63.9	11.1	61.2	61.2	7.9	29.6		3.5	24.2	24.2
Actuated g/C Ratio	0.11	0.49	0.49	0.09	0.47	0.47	0.06	0.23		0.03	0.19	0.19
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	187	1738	777	151	1664	744	107	395		47	346	294
v/s Ratio Prot	c0.10	0.22		0.05	c0.48		c0.04	0.15		0.01	c0.17	
v/s Ratio Perm		87.53	0.02			0.01						0.03
v/c Ratio	0.98	0.45	0.04	0.64	1.02	0.02	0.60	0.68		0.51	0.92	0.17
Uniform Delay, d1	58.0	21.6	17.2	57.5	34.4	18.4	59.6	45.9		62.5	52.0	44.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.6	0.3	0.0	6.3	28.6	0.0	5.9	3.8		3.8	28.9	0.1
Delay (s)	118.6	21.8	17.2	63.8	63.0	18.4	65.4	49.8		66.3	80.9	44.6
Level of Service	F	C	В	E	E	В	E	D		E	F	D
Approach Delay (s)		38.9			62.4			52.6			67.2	
Approach LOS		D			E			D			E	
Intersection Summary												
HCM 2000 Control Delay			55.7	Н	CM 2000	Level of	Service		Е	The same		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			130.1	Sum of lost time (s)					23.0			
Intersection Capacity Utilization			90.6%			of Service)		Е			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	^	7	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	177	648	23	16	1591	284	40	146	11	351	121	78
Future Volume (vph)	177	648	23	16	1591	284	40	146	11	351	121	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1833		1681	1728	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1833		1681	1728	1583
Peak-hour factor, PHF	0.82	0.98	0.96	0.98	0.98	0.95	0.98	0.85	0.92	0.96	0.92	0.81
Adj. Flow (vph)	216	661	24	16	1623	299	41	172	12	366	132	96
RTOR Reduction (vph)	0	0	13	0	0	74	0	2	0	0	0	79
Lane Group Flow (vph)	216	661	11	16	1623	225	0	223	0	245	253	17
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	1 OIIII
Permitted Phases			4			8	bir de					6
Actuated Green, G (s)	10.4	59.1	59.1	1.8	50.8	50.8		19.6		22.1	22.1	22.1
Effective Green, g (s)	10.4	59.1	59.1	1.8	50.8	50.8		19.6		22.1	22.1	22.1
Actuated g/C Ratio	0.08	0.46	0.46	0.01	0.40	0.40		0.15		0.17	0.17	0.17
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	143	1632	730	24	1403	627		280		290	298	273
v/s Ratio Prot	c0.12	0.19		0.01	c0.46			c0.12		0.15	c0.15	210
v/s Ratio Perm			0.01			0.14						0.01
v/c Ratio	1.51	0.41	0.02	0.67	1.16	0.36		0.80		0.84	0.85	0.06
Uniform Delay, d1	58.8	22.9	18.7	62.9	38.6	27.2		52.3		51.3	51.4	44.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	262.3	0.5	0.0	42.9	79.0	1.0		13.7		18.9	18.9	0.0
Delay (s)	321.2	23.3	18.7	105.8	117.7	28.2		66.0		70.3	70.3	44.4
Level of Service	F	C	В	F	F	C		E		E	E	D
Approach Delay (s)		94.6			103.8			66.0			66.1	-
Approach LOS		F			F			Е			E	
Intersection Summary												
HCM 2000 Control Delay			93.1	Н	CM 2000	Level of S	Service		F			
HCM 2000 Volume to Capac	city ratio		1.06									
Actuated Cycle Length (s)			128.1	Sı	um of lost	time (s)			25.5			
Intersection Capacity Utilizat	tion		98.2%			of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7		4	7	ሻ	47+		ሻሻ	44	
Traffic Volume (vph)	50	154	25	42	178	298	43	350	43	794	1253	124
Future Volume (vph)	50	154	25	42	178	298	43	350	43	794	1253	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1827	1568	1752	3444		3400	3457	
Flt Permitted	0.28	1.00	1.00		0.90	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	523	1845	1568		1669	1568	1752	3444		3400	3457	
Peak-hour factor, PHF	0.88	0.86	0.88	0.85	0.87	0.80	0.88	0.88	0.83	0.82	0.88	0.88
Adj. Flow (vph)	57	179	28	49	205	372	49	398	52	968	1424	141
RTOR Reduction (vph)	0	0	20	0	0	0	0	11	0	0	6	0
Lane Group Flow (vph)	57	179	8	0	254	373	49	439	0	968	1559	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	-
Permitted Phases	4		4	8		Free						
Actuated Green, G (s)	24.5	24.5	24.5		18.4	90.0	3.3	20.3		31.8	48.8	
Effective Green, g (s)	24.5	24.5	24.5		18.4	90.0	3.3	20.3		31.8	48.8	
Actuated g/C Ratio	0.27	0.27	0.27		0.20	1.00	0.04	0.23		0.35	0.54	
Clearance Time (s)	3.5	4.6	4.6		4.0		3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5		2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	186	502	426		341	1568	64	776		1201	1874	
v/s Ratio Prot	0.01	0.10					c0.03	0.13		0.28	c0.45	
v/s Ratio Perm	0.07		0.00		c0.15	c0.24						
v/c Ratio	0.31	0.36	0.02		0.74	0.24	0.77	0.57		0.81	0.83	
Uniform Delay, d1	25.4	26.4	24.0		33.6	0.0	43.0	30.9		26.3	17.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3	0.0		8.1	0.4	37.9	3.0		4.0	4.5	
Delay (s)	25.7	26.7	24.0		41.7	0.4	80.8	33.9		30.4	21.7	
Level of Service	С	С	С		D	Α	F	С		С	С	
Approach Delay (s)		26.2			17.1			38.5			25.0	
Approach LOS		С			В			D			С	
Intersection Summary												
HCM 2000 Control Delay			25.5	Н	CM 2000	Level of	Service		С	<u> </u>		
HCM 2000 Volume to Capa	acity ratio		0.79									3.333
Actuated Cycle Length (s)			90.0	S	um of los	t time (s)			16.3			
Intersection Capacity Utilization			76.6%	IC	U Level	of Service			D			
Analysis Period (min)			15								11 11	
c Critical Lane Group												





Site: El Rancho Dr/Sullivan Ln

Existing Plus Project Conditions - with Mitigation AM Peak Hour Roundabout

Mov	OD	Demand		Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	El Rancho D	or NB								perven	ШЭП
8	T1	96	2.0	0.560	17.4	LOSC	2.2	55.7	0.69	0.76	28.7
18	R2	209	2.0	0.560	17.4	LOS C	2.2	55.7	0.69	0.76	28.2
Approa	ich	306	2.0	0.560	17.4	LOS C	2.2	55.7	0.69	0.76	28.3
East: S	ullivan Ln W	/B									
1	L2	100	2.0	0.100	4.5	LOSA	0.4	9.1	0.22	0.11	32.1
16	R2	591	2.0	0.589	11.5	LOS B	4.1	103.0	0.41	0.25	30.1
Approa	ich	691	2.0	0.589	10.5	LOS B	4.1	103.0	0.39	0.23	30.4
North: I	El Rancho D	r SB									
7	L2	990	2.0	0.656	13.5	LOS B	5.1	130.7	0.48	0.30	28.8
4	T1	324	2.0	0.656	13.5	LOS B	5.1	130.7	0.48	0.30	29.3
Approa	ich	1314	2.0	0.656	13.5	LOS B	5.1	130.7	0.48	0.30	28.9
All Vehi	icles	2311	2.0	0.656	13.1	LOSB	5.1	130.7	0.48	0.34	29.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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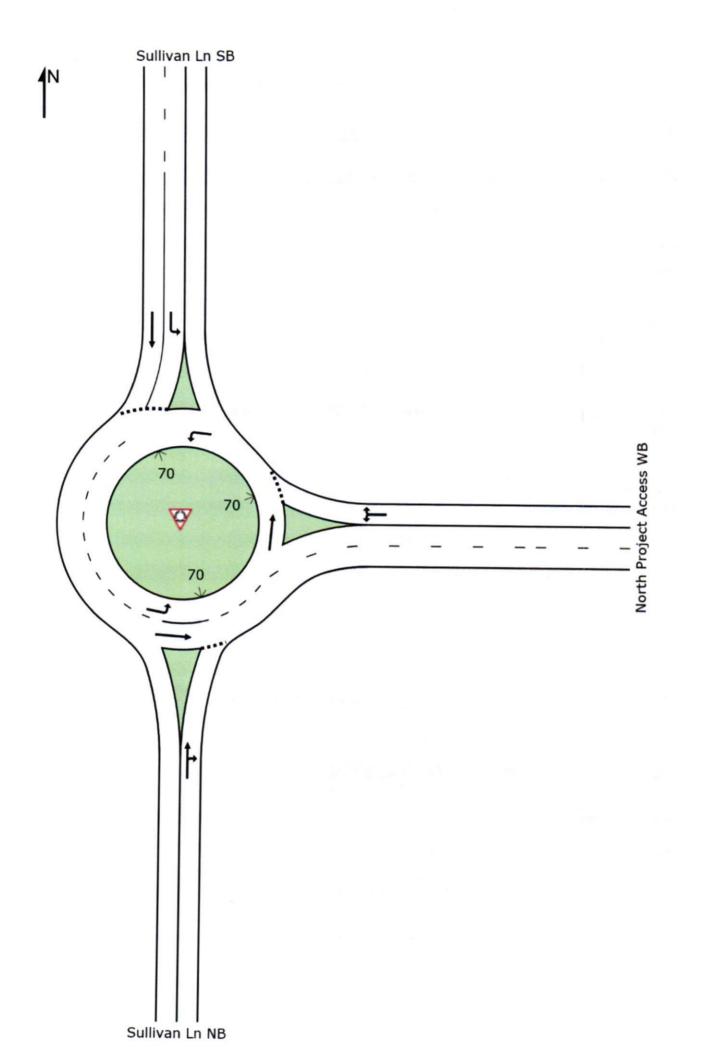
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	7	^	7	ሻ	4		ሻሻ	†	7
Traffic Volume (vph)	177	648	23	16	1591	284	40	146	11	351	121	78
Future Volume (vph)	177	648	23	16	1591	284	40	146	11	351	121	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1845		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1845		3433	1863	1583
Peak-hour factor, PHF	0.82	0.98	0.96	0.98	0.98	0.95	0.98	0.85	0.92	0.96	0.92	0.81
Adj. Flow (vph)	216	661	24	16	1623	299	41	172	12	366	132	96
RTOR Reduction (vph)	0	0	10	0	0	97	0	2	0	0	0	83
Lane Group Flow (vph)	216	661	14	16	1623	202	41	182	0	366	132	13
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	1 01111
Permitted Phases		No.	4			8						6
Actuated Green, G (s)	22.8	84.6	84.6	2.9	65.0	65.0	16.6	20.5		16.5	20.4	20.4
Effective Green, g (s)	22.8	84.6	84.6	2.9	65.0	65.0	16.6	20.5		16.5	20.4	20.4
Actuated g/C Ratio	0.15	0.56	0.56	0.02	0.43	0.43	0.11	0.14		0.11	0.14	0.14
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	269	1995	892	34	1533	685	195	252		377	253	215
v/s Ratio Prot	c0.12	0.19		0.01	c0.46		0.02	c0.10		c0.11	0.07	
v/s Ratio Perm			0.01			0.13						0.01
v/c Ratio	0.80	0.33	0.02	0.47	1.06	0.30	0.21	0.72		0.97	0.52	0.06
Uniform Delay, d1	61.4	17.5	14.4	72.8	42.5	27.6	60.7	62.0		66.5	60.3	56.5
Progression Factor	0.76	0.83	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.7	0.3	0.0	3.7	40.3	1.1	0.2	8.4		38.3	0.9	0.0
Delay (s)	60.4	14.9	14.4	76.5	82.8	28.7	60.9	70.4		104.8	61.2	56.5
Level of Service	E	В	В	E	F	C	E	Е		F	E	E
Approach Delay (s)		25.8			74.4			68.7			87.3	
Approach LOS	1000	C			E			E			F	
Intersection Summary												
HCM 2000 Control Delay			64.2	Н	CM 2000	Level of S	Service		E			
HCM 2000 Volume to Capa	city ratio		0.95									
Actuated Cycle Length (s)			150.0	S	um of lost	time (s)			25.5			1100
Intersection Capacity Utiliza	tion		93.1%	IC	U Level o	of Service			F			
Analysis Period (min)			15							A SALVE		
c Critical Lane Group												

Intersection Summary				
HCM 2000 Control Delay	64.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.5	
Intersection Capacity Utilization	93.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

	٠	→	•	•	←		4	†	~	>	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7		4	7	ሻ	41		ሻሻ	†	
Traffic Volume (vph)	86	125	59	42	111	560	43	1054	34	341	741	50
Future Volume (vph)	86	125	59	42	111	560	43	1054	34	341	741	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1819	1568	1752	3489		3400	3471	
Flt Permitted	0.49	1.00	1.00		0.88	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	897	1845	1568		1624	1568	1752	3489		3400	3471	
Peak-hour factor, PHF	0.83	0.84	0.82	0.81	0.82	0.80	0.83	0.84	0.84	0.81	0.84	0.83
Adj. Flow (vph)	104	149	72	52	135	700	52	1255	40	421	882	60
RTOR Reduction (vph)	0	0	47	0	0	261	0	2	0	0	4	0
Lane Group Flow (vph)	104	149	25	0	187	439	52	1293	0	421	938	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	11
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	45.9	45.9	45.9		39.0	39.0	16.8	51.5		19.2	53.9	
Effective Green, g (s)	45.9	45.9	45.9		39.0	39.0	16.8	51.5		19.2	53.9	
Actuated g/C Ratio	0.35	0.35	0.35		0.30	0.30	0.13	0.40		0.15	0.41	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	343	651	553		487	470	226	1382		502	1439	THE STATE OF THE S
v/s Ratio Prot	c0.01	0.08					0.03	c0.37		c0.12	0.27	
v/s Ratio Perm	0.10		0.02		0.12	c0.28						
v/c Ratio	0.30	0.23	0.05		0.38	0.93	0.23	0.94		0.84	0.65	
Uniform Delay, d1	31.2	29.6	27.7		36.0	44.2	50.8	37.7		53.9	30.5	
Progression Factor	1.00	1.00	1.00		1.02	1.09	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1	0.0		0.4	25.6	0.2	13.1		11.7	2.3	
Delay (s)	31.3	29.7	27.7		37.0	73.7	51.0	50.7		65.6	32.8	
Level of Service	С	С	С		D	Е	D	D		Е	С	
Approach Delay (s)		29.8			66.0			50.7			43.0	
Approach LOS		С			Е			D			D	
Intersection Summary												
HCM 2000 Control Delay			49.7	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capa	acity ratio		0.90									1574
Actuated Cycle Length (s)			130.0		um of los				16.3			
Intersection Capacity Utiliz	ation		83.1%	IC	U Level	of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

ntersection								
nt Delay, s/veh	319.1							
Novement	WBL	WBR	NBT	NBR	SBL	SBT		
ane Configurations	A		4		ሻ	†		
raffic Vol, veh/h	100	534	230	65	379	133		
uture Vol, veh/h	100	534	230	65	379	133		
onflicting Peds, #/hr	0	0	0	0	0	0		
ign Control	Stop	Stop	Free	Free	Free	Free		
T Channelized		None		None		None		
Storage Length	0	-	-	-	200	-		
eh in Median Storage	,# 0		0			0		
Grade, %	0	-	0	-	-	0		
eak Hour Factor	74	78	81	77	80	81		
leavy Vehicles, %	2	2	2	2	2	2		
Ivmt Flow	135	685	284	84	474	164		
								A. A.
The state of the s	Minor1		/lajor1		Major2			
Conflicting Flow All	1438	326	0	0	368	0		
Stage 1	326					-		
Stage 2	1112	-	-	-	-	-		
critical Hdwy	6.42	6.22			4.12			
ritical Hdwy Stg 1	5.42	-	-	-	-	7=		
Critical Hdwy Stg 2	5.42							
Follow-up Hdwy	3.518		-	-	2.218	-		
Pot Cap-1 Maneuver	147	715		-	1191	-		
Stage 1	731	-	-	-	-	-		
Stage 2	315							
Platoon blocked, %			-			-		
Mov Cap-1 Maneuver	~ 88	715			1191			
Mov Cap-2 Maneuver	~ 88	-	-		-	-		
Stage 1	731							
Stage 2	190	-	-	-	-	-		
pproach	WB		NB		SB			
HCM Control Delay, s	\$ 705		0		7.4			
HCM LOS	F							
Minor Lane/Major Mvn	nt	NBT	NBR	WBLn1	SBL	SBT		
Capacity (veh/h)				329	1191			
CM Lane V/C Ratio		-	-	2.492	0.398	-		
HCM Control Delay (s)			\$ 705	10			
HCM Lane LOS		-	-	_	. В	-		
HCM 95th %tile Q(veh	1)	-		66	1.9			
Notes								
: Volume exceeds ca	4	f. D.	alan av	ceeds 3	000	+· Com	putation Not Defined	*: All major volume in platoon





Site: Sullivan Ln/North Project Access

Existing Plus Project Conditions Afternoon Peak Hour Roundabout

		rmance - Ve		14 1 1 1 1 1 1 1							100000000000000000000000000000000000000
Mov	OD	Demand		Deg.	Average	Level of	95% Back		Prop.	Effective	Average
ID	Mov	Total	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
	图如他的图	veh/h	%	v/c	sec		veh	ft		per veh	mph
South:	Sullivan Ln	NB									
8	T1	487	2.0	0.513	9.8	LOSA	2.2	56.0	0.31	0.21	32.0
18	R2	28	2.0	0.513	9.8	LOSA	2.2	56.0	0.31	0.21	31.4
Approa	ich	515	2.0	0.513	9.8	LOSA	2.2	56.0	0.31	0.21	32.0
East: N	lorth Project	Access WB									
1	L2	64	2.0	0.520	13.6	LOS B	2.8	70.9	0.67	0.71	29.9
16	R2	287	2.0	0.520	13.6	LOS B	2.8	70.9	0.67	0.71	29.3
Approa	ich	351	2.0	0.520	13.6	LOS B	2.8	70.9	0.67	0.71	29.4
North:	Sullivan Ln S	SB									
7	L2	136	2.0	0.132	4.7	LOSA	0.5	12.5	0.18	0.08	32.2
4	T1	390	2.0	0.376	7.4	LOSA	1.9	47.9	0.24	0.12	33.2
Approa	ich	526	2.0	0.376	6.7	LOSA	1.9	47.9	0.22	0.11	32.9
All Veh	icles	1392	2.0	0.520	9.6	LOSA	2.8	70.9	0.37	0.30	31.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

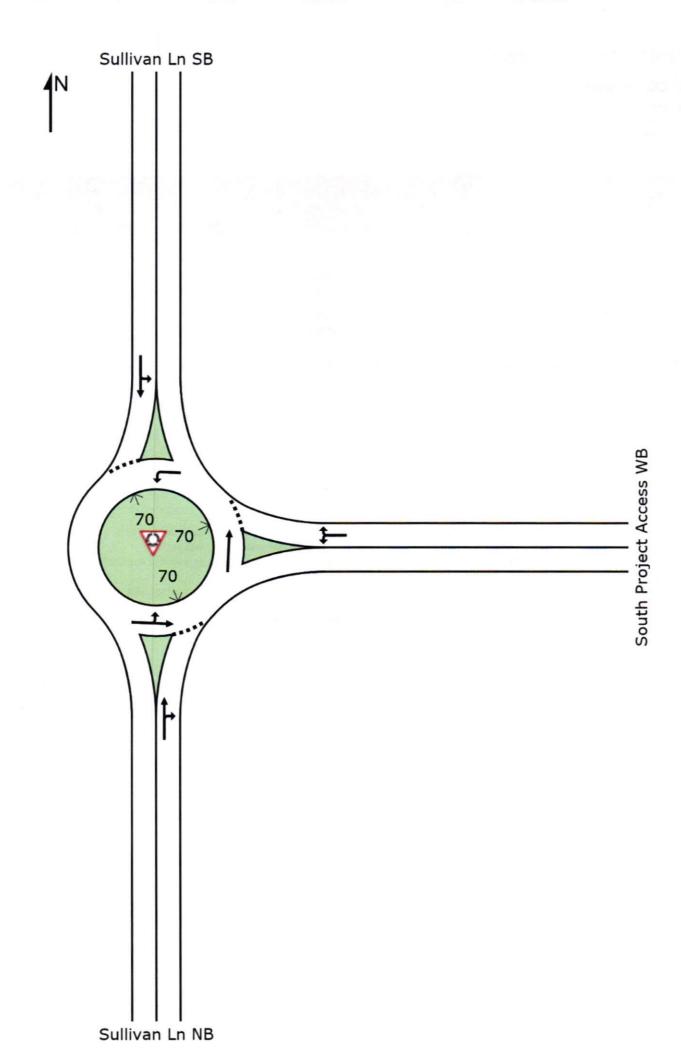
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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\EPP-Afternoon.sip6

8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y	LDI	NDL	A A	100	JON
Traffic Vol, veh/h	0	15	11	441	390	1
						1
Future Vol, veh/h	0	15	11	441	390	1
Conflicting Peds, #/hr	O Cton	O Cton	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None				
Storage Length	0	-	-	-	-	
Veh in Median Storage		1		0	0	
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	81	81	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	13	544	481	1
Matan (Ma	111 -					
	Minor2		Major1		Major2	
Conflicting Flow All	1053	482	483	0	-	0
Stage 1	482					
Stage 2	571	-		-	-	-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-				
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	251	584	1080		-	
Stage 1	621	-	-	-		-
Stage 2	565	_				
Platoon blocked, %				-	_	_
Mov Cap-1 Maneuver	247	584	1080	1		
Mov Cap-2 Maneuver	247	-	-	_		
Stage 1	621					
Stage 2	555	SHARE			Stores.	
Staye 2	555		-	-	-	
Manager of the Control of the Contro			Margia.			
Approach	EB		NB		SB	
HCM Control Delay, s	11.4		0.2		0	
HCM LOS	В		The state of the s			
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1080				
HCM Lane V/C Ratio		0.012	-	0.031	-	-
HCM Control Delay (s)		8.4	0	11.4		
HCM Lane LOS		Α	Α	В	-	-
HCM 95th %tile Q(veh)	0		0.1		
				THE RESERVE AND ADDRESS.		





Site: Sullivan Ln/South Project Access

Existing Plus Project Conditions Afternoon Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	Sullivan Ln	NB									
8	T1	370	2.0	0.419	8.1	LOSA	2.2	56.5	0.28	0.15	32.8
18	R2	60	2.0	0.419	8.1	LOSA	2.2	56.5	0.28	0.15	32.1
Approa	ch	430	2.0	0.419	8.1	LOSA	2.2	56.5	0.28	0.15	32.7
East: S	outh Project	Access WB									
1	L2	128	2.0	0.381	9.5	LOSA	1.6	41.7	0.54	0.51	31.1
16	R2	161	2.0	0.381	9.5	LOSA	1.6	41.7	0.54	0.51	30.5
Approa	ch	289	2.0	0.381	9.5	LOSA	1.6	41.7	0.54	0.51	30.8
North:	Sullivan Ln S	SB									
7	L2	76	2.0	0.481	9.5	LOSA	2.7	68.4	0.40	0.26	31.7
4	T1	392	2.0	0.481	9.5	LOSA	2.7	68.4	0.40	0.26	31.8
Approa	ch	468	2.0	0.481	9.5	LOSA	2.7	68.4	0.40	0.26	31.8
All Vehi	icles	1187	2.0	0.481	9.0	LOSA	2.7	68.4	0.39	0.28	31.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

Intersection							1911					
Int Delay, s/veh	3.1						15					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	LUL	4	LUIT	TIDE	4	HUNK	ሻ	4	HOI	ODL	4	ODIT
Traffic Vol, veh/h	10	0	78	27	1	15	60	353	10	4	436	4
Future Vol, veh/h	10	0	78	27	1	15	60	353	10	4	436	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	Olop -	Olop	None	Olop -	-	None	-	-	None	-	-	None
Storage Length		Bh213	-			-	140		-	West 1000		-
Veh in Median Storage	e.# -	0			0		140	0			0	
Grade, %	c, # - -	0	_		0	_		0	-		0	
Peak Hour Factor	83	89	89	84	89	89	88	87	83	89	84	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	88	32	1	17	68	406	12	4	519	4
MINITE FIOW	12	U	00	32		11	00	400	12		010	
Major/Minor	Minor2	SHEET!	Market Company	Minor1			Major1			Major2		3.73
Conflicting Flow All	1087	1084	521	1122	1081	412	524	0	0	418	0	0
Stage 1	530	530		548	548							
Stage 2	557	554	-	574	533	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	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			70 F -				
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	194	217	555	183	218	640	1043			1141		
Stage 1	533	527	-	521	517		-	-	-	-	-	-
Stage 2	515	514	-	504	525						-	
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	178	202	555	146	203	640	1043			1141		
Mov Cap-2 Maneuver		202	-	146	203	-	. ·	-	-	-	-	
Stage 1	498	524		487	483							
Stage 2	468	480	-	422	522	-	-	-	-	-		
									2186			
Approach	EB			WB	ACCE		NB			SB		
HCM Control Delay, s				29.1		(20 mg	1.2			0.1		March 1
HCM LOS	15.5 C			29.1 D			1.2			0.1		
HOW LOS	U			U								5555
				Man	EDI (NDI 1	001	007	CDD			
Minor Lane/Major Mvr	mt	NBL	NBT		EBLn1\		SBL	SBT	SBR			
Capacity (veh/h)	114	1043					1141					10.60
HCM Lane V/C Ratio		0.065		-	0.226			-				
HCM Control Delay (s	3)	8.7			15.5		8.2	0	•			
HCM Lane LOS		Α	-		C	D	Α	Α	-			
HCM 95th %tile Q(veh		0.2			0.9	1	0	Property.				

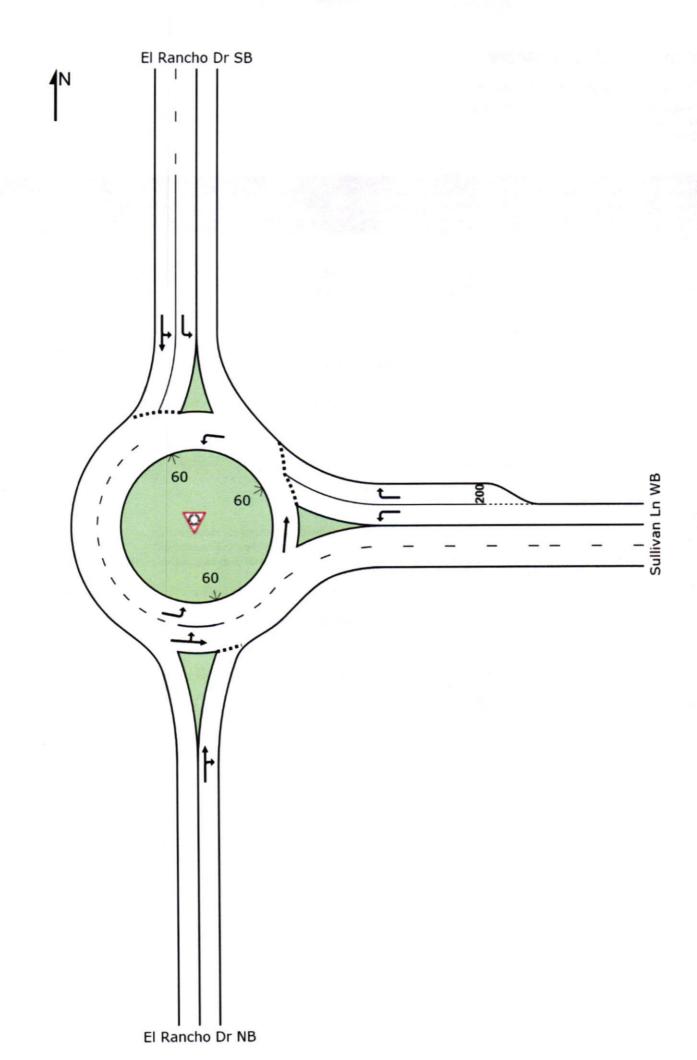
	٠	→	•	•	←	•	1	†	~	>	ļ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	^	7	ሻ	**	7	ሻ	1>		ሻ	†	7
Traffic Volume (vph)	184	1170	15	98	1048	45	97	197	98	20	161	133
Future Volume (vph)	184	1170	15	98	1048	45	97	197	98	20	161	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1767		1770	1863	1583
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1767		1770	1863	1583
Peak-hour factor, PHF	0.96	0.98	0.94	0.84	0.97	0.98	0.97	0.95	0.91	0.98	0.89	0.88
Adj. Flow (vph)	192	1194	16	117	1080	46	100	207	108	20	181	151
RTOR Reduction (vph)	0	0	8	0	0	25	0	15	0	0	0	128
Lane Group Flow (vph)	192	1194	8	117	1080	21	100	300	0	20	181	23
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	. 0
Permitted Phases			4			8						6
Actuated Green, G (s)	17.3	64.0	64.0	12.2	58.9	58.9	11.1	27.7		4.1	19.7	19.7
Effective Green, g (s)	17.3	64.0	64.0	12.2	58.9	58.9	11.1	27.7		4.1	19.7	19.7
Actuated g/C Ratio	0.13	0.49	0.49	0.09	0.45	0.45	0.09	0.21		0.03	0.15	0.15
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	235	1742	779	166	1603	717	151	376		55	282	239
v/s Ratio Prot	c0.11	c0.34		0.07	0.31		c0.06	c0.17		0.01	0.10	
v/s Ratio Perm			0.00			0.01						0.01
v/c Ratio	0.82	0.69	0.01	0.70	0.67	0.03	0.66	0.80		0.36	0.64	0.10
Uniform Delay, d1	54.8	25.3	16.8	57.2	28.0	19.7	57.6	48.5		61.7	51.8	47.5
Progression Factor	1.00	1.00	1.00	1.10	0.70	1.00	1.00	1.00		0.96	0.84	0.87
Incremental Delay, d2	18.4	2.2	0.0	7.1	1.5	0.0	8.2	10.5		1.4	3.6	0.1
Delay (s)	73.2	27.5	16.9	69.9	21.1	19.8	65.8	59.0		60.7	46.9	41.3
Level of Service	E	C	В	E	C	В	E	E		E	D	D
Approach Delay (s)		33.6			25.6			60.6			45.3	
Approach LOS		C			C			Е			D	
Intersection Summary	STATE OF								Maria (Sept.)			
HCM 2000 Control Delay			35.2	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capa	city ratio		0.78				- CATTION					
Actuated Cycle Length (s)			130.0	SI	um of lost	time (s)			23.0			
Intersection Capacity Utiliza	ition		77.2%		U Level o				D	Manage Vell		
Analysis Period (min)			15									
0 111 11 0				The state of the s								

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7		4		ሻ	स	7
Traffic Volume (vph)	90	1156	42	26	1009	207	46	126	22	297	108	136
Future Volume (vph)	90	1156	42	26	1009	207	46	126	22	297	108	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1814		1681	1731	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1814		1681	1731	1583
Peak-hour factor, PHF	0.87	0.91	0.88	0.91	0.91	0.89	0.88	0.88	0.91	0.89	0.82	0.81
Adj. Flow (vph)	103	1270	48	29	1109	233	52	143	24	334	132	168
RTOR Reduction (vph)	0	0	27	0	0	83	0	4	0	0	0	110
Lane Group Flow (vph)	103	1270	21	29	1109	150	0	215	0	230	236	58
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.2	57.4	57.4	4.7	50.2	50.2		19.8		22.6	22.6	22.6
Effective Green, g (s)	12.2	57.4	57.4	4.7	50.2	50.2		19.8		22.6	22.6	22.6
Actuated g/C Ratio	0.09	0.44	0.44	0.04	0.39	0.39		0.15		0.17	0.17	0.17
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	166	1562	698	63	1366	611		276		292	300	275
v/s Ratio Prot	c0.06	c0.36		0.02	0.31			c0.12		c0.14	0.14	
v/s Ratio Perm			0.01			0.09						0.04
v/c Ratio	0.62	0.81	0.03	0.46	0.81	0.24		0.78		0.79	0.79	0.21
Uniform Delay, d1	56.7	31.6	20.5	61.4	35.7	27.0		53.0		51.4	51.4	46.1
Progression Factor	1.04	1.33	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	3.8	0.1	1.9	5.3	1.0		11.9		12.2	11.8	0.1
Delay (s)	63.1	45.8	20.6	63.3	41.0	28.0		64.8		63.6	63.2	46.2
Level of Service	E	D	C	E	D	C		E		E	E	D
Approach Delay (s)		46.2			39.3			64.8			58.8	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			46.9	Н	CM 2000	Level of	Service		D			
HCM 2000 Volume to Capaci	ty ratio		0.81									
Actuated Cycle Length (s)			130.0		um of lost				25.5			
Intersection Capacity Utilization	on		78.1%	IC	U Level	of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	†	7		4	7	ሻ	47		ሻሻ	† \$	
Traffic Volume (vph)	86	125	59	42	111	560	43	1054	34	341	741	50
Future Volume (vph)	86	125	59	42	111	560	43	1054	34	341	741	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1819	1568	1752	3489		3400	3471	
FIt Permitted	0.35	1.00	1.00		0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	644	1845	1568		1603	1568	1752	3489		3400	3471	
Peak-hour factor, PHF	0.83	0.84	0.82	0.81	0.82	0.80	0.83	0.84	0.84	0.81	0.84	0.83
Adj. Flow (vph)	104	149	72	52	135	700	52	1255	40	421	882	60
RTOR Reduction (vph)	0	0	55	0	0	0	0	2	0	0	4	0
Lane Group Flow (vph)	104	149	17	0	187	700	52	1293	0	421	938	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8	-	Free	-					
Actuated Green, G (s)	21.3	21.3	21.3		15.1	90.0	8.6	37.9		17.4	46.7	
Effective Green, g (s)	21.3	21.3	21.3		15.1	90.0	8.6	37.9		17.4	46.7	
Actuated g/C Ratio	0.24	0.24	0.24		0.17	1.00	0.10	0.42		0.19	0.52	
Clearance Time (s)	3.5	4.6	4.6		4.0		3.5	5.3		3.5	5.3	E STATE AND
Vehicle Extension (s)	2.0	2.5	2.5		2.5		2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	193	436	371		268	1568	167	1469		657	1801	
v/s Ratio Prot	0.02	0.08				1000	0.03	c0.37		c0.12	0.27	
v/s Ratio Perm	0.11		0.01		c0.12	c0.45	0.00	00.07		00.12	0.21	
v/c Ratio	0.54	0.34	0.05		0.70	0.45	0.31	0.88	2	0.64	0.52	-
Uniform Delay, d1	30.0	28.5	26.5		35.3	0.0	37.9	24.0		33.4	14.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	Allena
Incremental Delay, d2	1.5	0.3	0.0		7.1	0.9	0.4	7.8		2.1	1.1	
Delay (s)	31.4	28.9	26.5		42.4	0.9	38.3	31.8		35.6	15.4	
Level of Service	С	С	С		D	A	D	C		D	В	
Approach Delay (s)		29.2			9.7			32.1			21.6	
Approach LOS		С			Α			C			C	
Intersection Summary		100										
HCM 2000 Control Delay			23.1	Н	CM 2000	Level of S	Service		С			
HCM 2000 Volume to Capa	acity ratio		0.79				3,1,00		0			
Actuated Cycle Length (s)			90.0	Sı	um of lost	time (s)			16.3	Service Servic		
Intersection Capacity Utiliza	ation		69.7%			of Service			C			
Analysis Period (min)		ALL SALES	15	,0	2 201010	. 5011100			U			10.00
c Critical Lane Group												



Site: El Rancho Dr/Sullivan Ln

Existing Plus Project Conditions - with Mitigation Afternoon Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	El Rancho D						7011			per veri	IIII
8	T1	284	2.0	0.466	10.8	LOS B	1.8	46.0	0.50	0.53	31.3
18	R2	84	2.0	0.466	10.8	LOS B	1.8	46.0	0.50	0.53	30.8
Approa	ch	368	2.0	0.466	10.8	LOS B	1.8	46.0	0.50	0.53	31.2
East: S	ullivan Ln W	/B									
1	L2	135	2.0	0.163	6.0	LOSA	0.6	15.2	0.40	0.32	31.4
16	R2	685	2.0	0.826	25.4	LOS D	10.2	259.1	0.90	0.98	25.3
Approa	ch	820	2.0	0.826	22.2	LOS C	10.2	259.1	0.82	0.87	26.2
North: I	El Rancho D	r SB									
7	L2	474	2.0	0.330	7.2	LOSA	1.5	38.3	0.33	0.22	31.3
4	T1	164	2.0	0.330	7.2	LOSA	1.5	38.3	0.33	0.22	32.0
Approa	ch	638	2.0	0.330	7.2	LOSA	1.5	38.3	0.33	0.22	31.5
All Vehi	icles	1826	2.0	0.826	14.7	LOSB	10.2	259.1	0.59	0.57	28.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, January 04, 2019 4:51:10 PM SIDRA INTERSECTION 6.0.24.4877

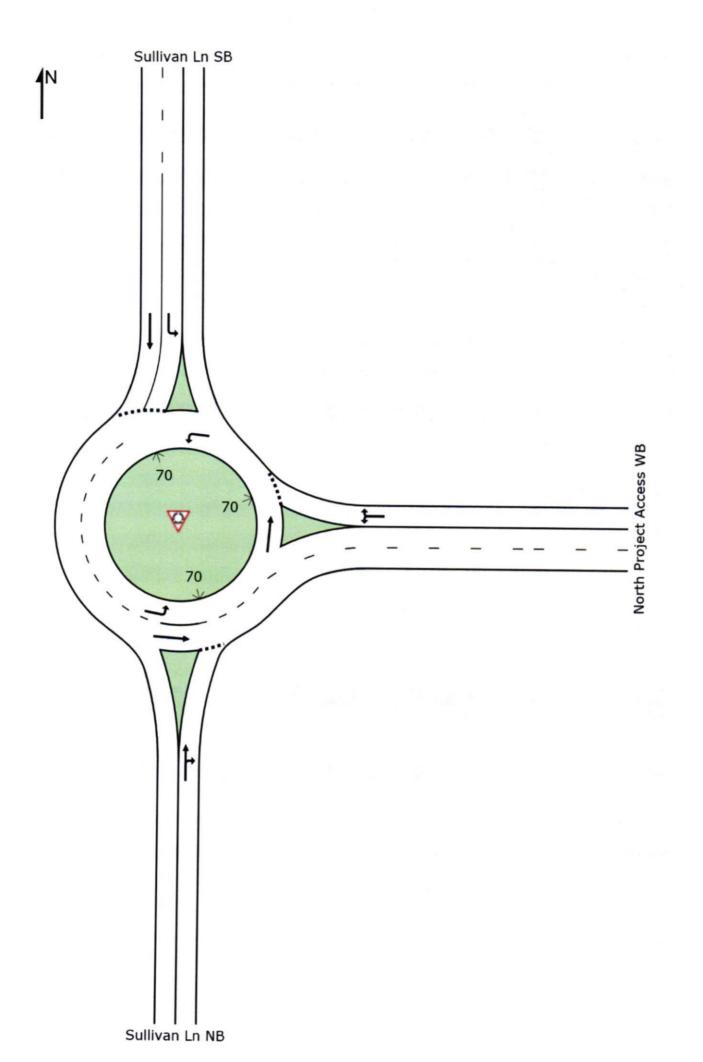
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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\EPP-Afternoon.sip6 8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7	*	4		ሻሻ	†	*
Traffic Volume (vph)	90	1156	42	26	1009	207	46	126	22	297	108	136
Future Volume (vph)	90	1156	42	26	1009	207	46	126	22	297	108	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1823		3433	1863	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1823		3433	1863	1583
Peak-hour factor, PHF	0.87	0.91	0.88	0.91	0.91	0.89	0.88	0.88	0.91	0.89	0.82	0.81
Adj. Flow (vph)	103	1270	48	29	1109	233	52	143	24	334	132	168
RTOR Reduction (vph)	0	0	23	0	0	110	0	5	0	0	0	145
Lane Group Flow (vph)	103	1270	25	29	1109	123	52	162	0	334	132	23
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	NEW YEAR					6
Actuated Green, G (s)	11.7	64.6	64.6	4.7	57.9	57.9	13.7	16.9		14.3	17.5	17.5
Effective Green, g (s)	11.7	64.6	64.6	4.7	57.9	57.9	13.7	16.9		14.3	17.5	17.5
Actuated g/C Ratio	0.09	0.51	0.51	0.04	0.46	0.46	0.11	0.13		0.11	0.14	0.14
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	164	1814	811	66	1626	727	192	244		389	258	219
v/s Ratio Prot	0.06	c0.36		0.02	c0.31		0.03	c0.09		c0.10	0.07	
v/s Ratio Perm	Marie Park		0.02		STATE OF	0.08						0.01
v/c Ratio	0.63	0.70	0.03	0.44	0.68	0.17	0.27	0.66		0.86	0.51	0.11
Uniform Delay, d1	55.1	23.3	15.2	59.4	26.8	20.0	51.6	51.8		54.9	50.3	47.4
Progression Factor	0.64	0.26	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	1.8	0.1	1.7	2.3	0.5	0.3	5.2		16.3	0.7	0.1
Delay (s)	39.3	7.7	15.2	61.1	29.1	20.5	51.8	57.0		71.2	51.0	47.5
Level of Service	D	A	В	E	C	C	D	E		E	D	D
Approach Delay (s)		10.3			28.3			55.8			60.7	
Approach LOS		В			C			E			E	
Intersection Summary					100000	Terran						
HCM 2000 Control Delay			28.6	Н	CM 2000	Level of S	Service		С			
HCM 2000 Volume to Capaci	ity ratio		0.74									
Actuated Cycle Length (s)	ity rutio		126.0	S	um of los	t time (s)			25.5			
Intersection Capacity Utilizati	on		73.0%			of Service			С			
Analysis Period (min)		See See	15		20.0	2311130						
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	↑	7		4	7	*	† ‡		ሻሻ	† ‡	
Traffic Volume (vph)	145	183	64	58	114	575	41	1307	32	343	665	68
Future Volume (vph)	145	183	64	58	114	575	41	1307	32	343	665	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1832	1583	1770	3526		3433	3490	
Flt Permitted	0.47	1.00	1.00		0.84	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	873	1863	1583		1560	1583	1770	3526		3433	3490	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	199	70	63	124	625	45	1421	35	373	723	74
RTOR Reduction (vph)	0	0	47	0	0	203	0	2	0	0	8	0
Lane Group Flow (vph)	158	199	23	0	187	422	45	1454	0	373	789	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	U U
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	33.3	33.3	33.3	_	26.9	26.9	12.8	41.7		11.6	40.5	2/25/00
Effective Green, g (s)	33.3	33.3	33.3		26.9	26.9	12.8	41.7		11.6	40.5	
Actuated g/C Ratio	0.33	0.33	0.33		0.27	0.27	0.13	0.42		0.12	0.40	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	John St.
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	322	620	527		419	425	226	1470		398	1413	
v/s Ratio Prot	c0.02	0.11	02.		110	420	0.03	c0.41		c0.11	0.23	
v/s Ratio Perm	0.15		0.01		0.12	c0.27	0.00	CU.+1		60.11	0.23	
v/c Ratio	0.49	0.32	0.04		0.45	0.99	0.20	0.99		0.94	0.56	
Uniform Delay, d1	27.9	24.9	22.6		30.4	36.4	39.0	28.9		43.8	22.9	2501,0003
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00		
Incremental Delay, d2	0.4	0.2	0.0		0.6	41.5	0.2	21.1			1.00	
Delay (s)	28.3	25.1	22.6		30.9	77.9	39.2	50.0		29.4	1.6	
Level of Service	C	C	C		C	11.5 E	D D	50.0 D		73.2	24.5	SEPTEMBER 1
Approach Delay (s)		25.9	U		67.1	_	U	49.7		E	C	
Approach LOS		C			67.1						40.0	CONTRACT OF
		· ·						D			D	
Intersection Summary												
HCM 2000 Control Delay			47.8	HC	CM 2000	Level of S	ervice		D			
HCM 2000 Volume to Capa	city ratio		0.96									
Actuated Cycle Length (s)			100.0	Su	m of lost	time (s)			16.3			
ntersection Capacity Utiliza	ition		94.0%	ICI	J Level o	f Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	91.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		4		7	1
Traffic Vol, veh/h	37	486	339	38	447	169
Future Vol, veh/h	37	486	339	38	447	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Carried Control		None
Storage Length	0	-		-	200	-
Veh in Median Storage			0		-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mymt Flow	42	546	381	43	502	190
WWIII I IOW	74	540	301	40	002	100
Major/Minor	Minor1	N	Najor1		Major2	
Conflicting Flow All	1596	402	0	0	424	0
Stage 1	402					
Stage 2	1194	-	-	-		
Critical Hdwy	6.42	6.22		-	4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-		-		
Follow-up Hdwy	3.518	3.318	-	-	2.218	
Pot Cap-1 Maneuver	117	648		-	1135	
Stage 1	676	-		-	-	-
Stage 2	287			Marie .		
Platoon blocked, %	201	200000	-	_		-
Mov Cap-1 Maneuver	65	648			1135	
Mov Cap-1 Maneuver	65	-	-	-	-	-
Stage 1	676					
	160		-	-		-
Stage 2	100	-				
	Later and					Sham's
Approach	WB	Terr	NB		SB	
HCM Control Delay, s	256.9		0		7.7	
HCM LOS	F					
Minor Lane/Major Mvn	nt	NBT	NRRI	WBLn1	SBL	SBT
	II.	IADI	NOIN		1135	-
Capacity (veh/h)				1.484		-
HCM Cantrol Dolay (c)		-		256.9	10.7	-
HCM Control Delay (s)		*			В	
HCM Lane LOS		-	-	F		-
HCM 95th %tile Q(veh)			31.1	2.3	



Site: Sullivan Ln/North Project Access

Existing Plus Project Conditions PM Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
South:	Sullivan Ln I		/0	VIC	sec		veh	ft		per veh	mph
8	T1	492	2.0	0.482	9.0	LOSA	2.0	51.7	0.21	0.11	32.4
18	R2	15	2.0	0.482	9.0	LOSA	2.0	51.7	0.21	0.11	31.8
Approa	ich	508	2.0	0.482	9.0	LOSA	2.0	51.7	0.21	0.11	32.4
East: N	lorth Project	Access WB									
1	L2	16	2.0	0.138	6.9	LOSA	0.5	12.1	0.50	0.47	32.8
16	R2	76	2.0	0.138	6.9	LOSA	0.5	12.1	0.50	0.47	32.2
Approa	ch	92	2.0	0.138	6.9	LOSA	0.5	12.1	0.50	0.47	32.3
North:	Sullivan Ln S	SB									
7	L2	70	2.0	0.064	3.8	LOSA	0.2	5.7	0.07	0.02	32.6
4	T1	458	2.0	0.420	7.8	LOSA	2.3	59.2	0.12	0.03	33.0
Approa	ch	527	2.0	0.420	7.3	LOSA	2.3	59.2	0.11	0.03	32.9
All Vehi	icles	1127	2.0	0.482	8.0	LOSA	2.3	59.2	0.19	0.10	32.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

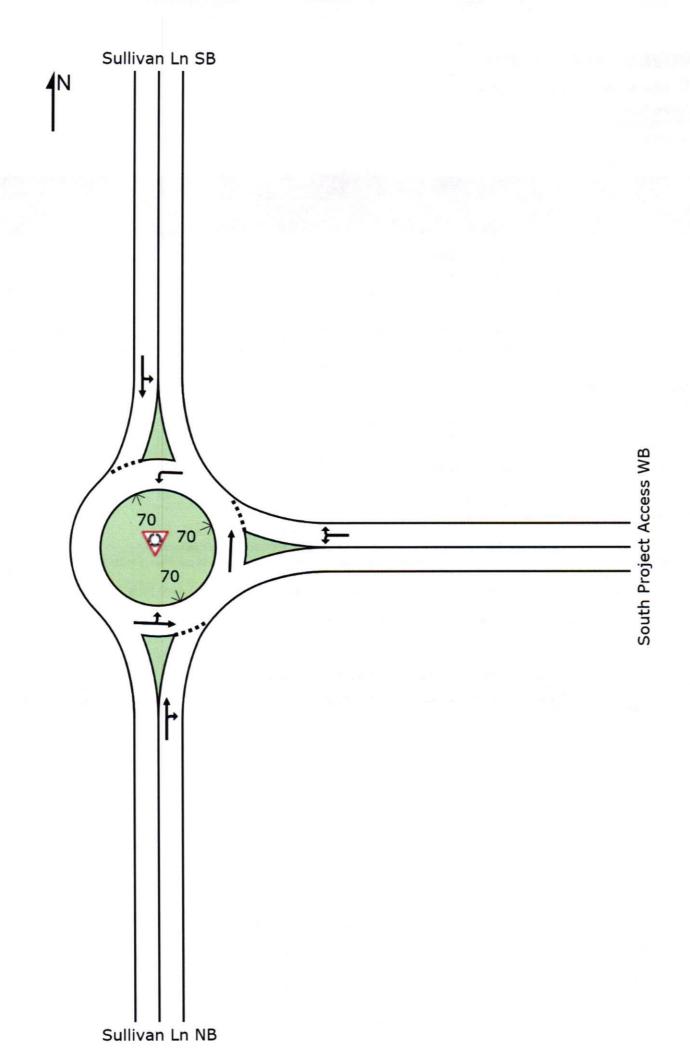
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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\EPP-PM.sip6

8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

Intersection						
Int Delay, s/veh	0.3					
And the special control of the special special control of the special	1000000	EDD	NDI	NDT	CDT	CPD
Movement	EBL	EBR	NBL	NBT €Î	SBT	SBR
Lane Configurations		0	45			-
Traffic Vol, veh/h	2	8	15	465	431	5
Future Vol, veh/h	2	8	15	465	431	5
Conflicting Peds, #/hr	0	0	_ 0	_ 0	_ 0	_ 0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		110110	•	None	•	None
Storage Length	0	-	:=	-	-	-
Veh in Median Storage			•		0	
Grade, %	0	-	-	•	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	17	528	490	6
	Minor2		Major1		Major2	
Conflicting Flow All	1056	493	495	0	-	0
Stage 1	493	•				
Stage 2	563	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12			-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318	2.218	-		-
Pot Cap-1 Maneuver	250	576	1069			
Stage 1	614	-	-	-	_	-
Stage 2	570					
Platoon blocked, %	010			-	_	-
Mov Cap-1 Maneuver	244	576	1069			
Mov Cap-1 Maneuver	244	310	1009			
•		-	-		-	ersoner e
Stage 1	614	•	-	•		•
Stage 2	557	-	-	-	•	-
			1			
Approach	EB		NB		SB	
HCM Control Delay, s	13.2		0.3		0	
HCM LOS	13.2 B		0.5		U	
TION LOG	D					
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1069	1/2			
HCM Lane V/C Ratio		0.016		0.025	-	
HCM Control Delay (s)		8.4	0			
HCM Lane LOS		A	A	В	_	7/2
HCM 95th %tile Q(veh)	0	_	0.1		
. Tom our folie de ven	1	U		0.1		



Site: Sullivan Ln/South Project Access

Existing Plus Project Conditions PM Peak Hour Roundabout

		rmance - Ve				1	050/ BI-	"		Est v	
Mov ID	OD Mov	Demand Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back (Vehicles veh	or Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	Sullivan Ln I	NB									
8	T1	479	2.0	0.480	8.9	LOSA	2.9	73.3	0.21	0.09	32.5
18	R2	32	2.0	0.480	8.9	LOSA	2.9	73.3	0.21	0.09	31.7
Approa	ich	511	2.0	0.480	8.9	LOSA	2.9	73.3	0.21	0.09	32.4
East: S	outh Project	Access WB									
1	L2	34	2.0	0.112	6.5	LOSA	0.4	9.7	0.49	0.45	32.4
16	R2	42	2.0	0.112	6.5	LOSA	0.4	9.7	0.49	0.45	31.8
Approa	ich	76	2.0	0.112	6.5	LOSA	0.4	9.7	0.49	0.45	32.1
North:	Sullivan Ln S	SB									
7	L2	39	2.0	0.446	8.3	LOSA	2.5	64.6	0.19	0.07	32.5
4	T1	438	2.0	0.446	8.3	LOSA	2.5	64.6	0.19	0.07	32.6
Approa	ch	477	2.0	0.446	8.3	LOSA	2.5	64.6	0.19	0.07	32.6
All Vehi	icles	1064	2.0	0.480	8.4	LOSA	2.9	73.3	0.22	0.11	32.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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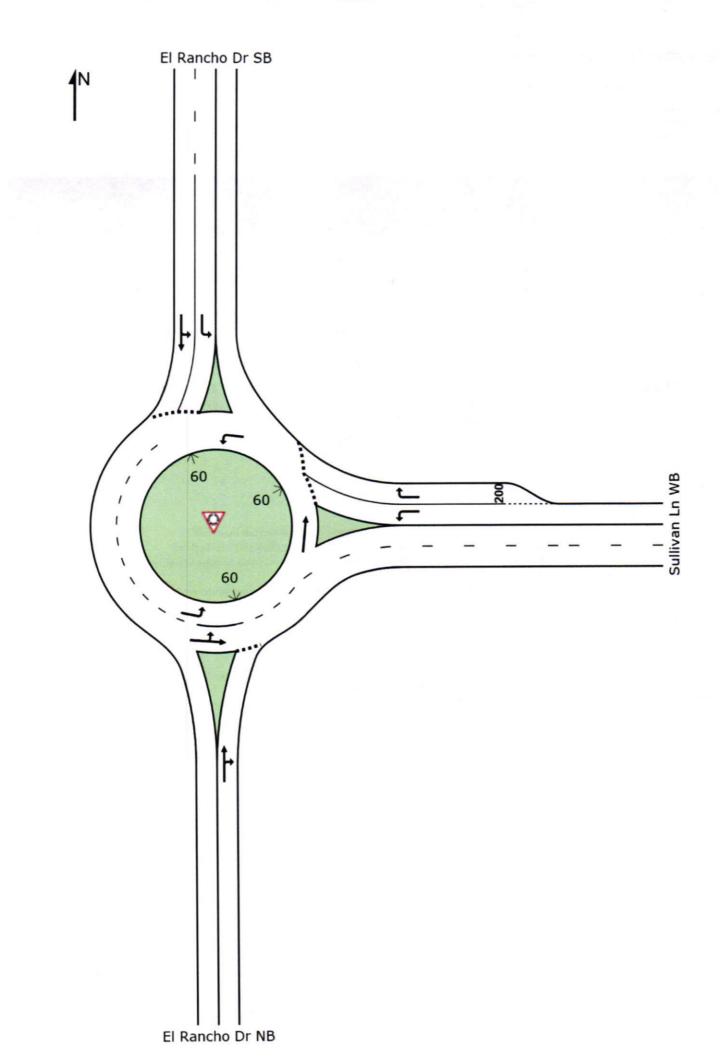
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Intersection						(A) (A) (A)						
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		7	1			4	
Traffic Vol, veh/h	21	0	150	30	1	4	55	445	22	10	414	10
Future Vol, veh/h	21	0	150	30	1	4	55	445	22	10	414	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	-		-	-			140	-	-	-	-	-
Veh in Median Storage	e.# -	0			0			0			0	Assis.
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
Mymt Flow	22	0	158	32	1	4	58	468	23	11	436	11
Major/Minor	Minor2			Minor1			Major1		ı	Major2		
Conflicting Flow All	1060	1069	441	1137	1063	480	446	0	0	492	0	0
Stage 1	462	462		596	596	-						
Stage 2	598	607	-	541	467		-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	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	202	221	616	179	223	586	1114			1071		
Stage 1	580	565		490	492		-	-	-	-	-	
Stage 2	489	486		525	562					-	1	
Platoon blocked, %								_	-		-	-
Mov Cap-1 Maneuver	190	207	616	126	208	586	1114			1071		
Mov Cap-2 Maneuver		207	-	126	208		-	-	-	-	-	
Stage 1	550	557		464	466							
Stage 2	459	461	-	385	554	-	-	-	-	-	-	
Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.8			39.7			0.9			0.2		
HCM LOS	С			Е								
Minor Lane/Major Mvr	nt	NBL	NBT	NBR	EBLn1\	and the same of the same of	SBL	SBT	SBR			
Capacity (veh/h)		1114			483		1071					
HCM Lane V/C Ratio		0.052	-	-	0.373		0.01	-	-			
HCM Control Delay (s	i)	8.4	-	-	16.8	39.7	8.4	0	-			
HCM Lane LOS		Α	-	-	C		Α	Α	-			
HCM 95th %tile Q(veh	n)	0.2			1.7	1	0					

	•	→	•	•	←	•	4	†	-	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	7	^	7	7	1		7	↑	7
Traffic Volume (vph)	182	1621	55	60	1288	52	96	275	85	30	105	121
Future Volume (vph)	182	1621	55	60	1288	52	96	275	85	30	105	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1797		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1797		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	188	1671	57	62	1328	54	99	284	88	31	108	125
RTOR Reduction (vph)	0	0	29	0	0	30	0	9	0	0	0	103
Lane Group Flow (vph)	188	1671	28	62	1328	24	99	363	0	31	108	22
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4	1 01111	3	8	1 OIIII	5	2		1	6	reilli
Permitted Phases			4			8					U	6
Actuated Green, G (s)	16.6	64.6	64.6	9.0	57.0	57.0	11.0	29.6		4.8	22.4	22.4
Effective Green, g (s)	16.6	64.6	64.6	9.0	57.0	57.0	11.0	29.6		4.8	22.4	22.4
Actuated g/C Ratio	0.13	0.50	0.50	0.07	0.44	0.44	0.08	0.23		0.04	0.17	0.17
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	226	1758	786	122	1551	694	149	409		65	321	272
v/s Ratio Prot	0.11	c0.47	100	0.04	c0.38	004	c0.06	c0.20		0.02	0.06	212
v/s Ratio Perm		00.11	0.02	0.04	00.00	0.01	CO.00	CO.20		0.02	0.00	0.01
v/c Ratio	0.83	0.95	0.04	0.51	0.86	0.03	0.66	0.89		0.48	0.34	0.01
Uniform Delay, d1	55.3	31.2	16.8	58.4	32.8	20.8	57.7	48.6		61.4		0.08
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			47.3	45.1
Incremental Delay, d2	21.3	12.6	0.1	0.7	3.8	0.1	8.3	19.5		1.00	1.00	1.00
Delay (s)	76.7	43.7	16.8	59.3	36.7	20.9	66.1	68.1		63.4	0.2	0.0
Level of Service	E	D	В	E	D	C C	E	E		03.4 E	47.5	45.2
Approach Delay (s)		46.2	-		37.1	C	-	67.7		E	D	D
Approach LOS		D			D			THE RESERVE THE PERSON NAMED IN COLUMN			48.3	
Intersection Summary					U			Е			D	
HCM 2000 Control Delay			45.6	LI	214 2000	l aveal af C						
HCM 2000 Volume to Capacit	hy ratio			П	CM 2000	Level of S	bervice		D			
Actuated Cycle Length (s)	y railo		0.95	0	m of last	time (-)			00.0			
Intersection Capacity Utilization	n		130.0		m of lost				23.0			
Analysis Period (min)	Л		91.8%	IC	U Level o	Service			F			
Critical Lane Group			15									

	•	→	•	•		•	4	†	~	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7		4		7	4	7
Traffic Volume (vph)	92	1609	35	40	1151	278	52	152	38	276	121	197
Future Volume (vph)	92	1609	35	40	1151	278	52	152	38	276	121	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1804		1681	1735	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1804		1681	1735	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	1694	37	42	1212	293	55	160	40	291	127	207
RTOR Reduction (vph)	0	0	21	0	0	92	0	6	0	0	0	152
Lane Group Flow (vph)	97	1694	16	42	1212	201	0	249	0	207	211	55
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	11.5	54.7	54.7	6.6	50.1	50.1		22.4		20.8	20.8	20.8
Effective Green, g (s)	11.5	54.7	54.7	6.6	50.1	50.1		22.4		20.8	20.8	20.8
Actuated g/C Ratio	0.09	0.42	0.42	0.05	0.39	0.39		0.17		0.16	0.16	0.16
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	156	1489	666	89	1363	610		310		268	277	253
v/s Ratio Prot	0.05	c0.48		0.02	c0.34			c0.14		c0.12	0.12	
v/s Ratio Perm			0.01			0.13						0.03
v/c Ratio	0.62	1.14	0.02	0.47	0.89	0.33		0.80		0.77	0.76	0.22
Uniform Delay, d1	57.2	37.6	22.0	60.0	37.4	28.1		51.7		52.3	52.2	47.5
Progression Factor	0.54	0.34	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	66.3	0.0	1.4	9.0	1.4		13.2		11.8	10.6	0.2
Delay (s)	33.7	79.1	22.1	61.4	46.3	29.6		64.9		64.2	62.8	47.7
Level of Service	C	E	C	E	D	C		E		E	E	D
Approach Delay (s)		75.6			43.6			64.9			58.3	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			60.8	H	CM 2000	Level of	Service		E			
HCM 2000 Volume to Capa	city ratio		1.01									
Actuated Cycle Length (s)			130.0		um of los				25.5		The Street	
Intersection Capacity Utiliza	ation		93.1%	10	CU Level	of Service	9		F			
Analysis Period (min)			15									

	٠	→	•	•	←	•	4	†	~	>	ţ	- ✓
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	↑	7		4	7	ሻ	†		ሻሻ	44	
Traffic Volume (vph)	145	183	64	58	114	575	41	1307	32	343	665	68
Future Volume (vph)	145	183	64	58	114	575	41	1307	32	343	665	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1832	1583	1770	3526		3433	3490	
Flt Permitted	0.34	1.00	1.00		0.82	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	638	1863	1583		1529	1583	1770	3526		3433	3490	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	199	70	63	124	625	45	1421	35	373	723	74
RTOR Reduction (vph)	0	0	53	0	0	0	0	2	0	0	7	0
Lane Group Flow (vph)	158	199	17	0	187	625	45	1454	0	373	790	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	CONTRACTOR OF THE PARTY OF THE
Permitted Phases	4		4	8	The same	Free						
Actuated Green, G (s)	24.0	24.0	24.0		16.8	100.0	13.9	46.4		16.2	48.7	
Effective Green, g (s)	24.0	24.0	24.0		16.8	100.0	13.9	46.4		16.2	48.7	
Actuated g/C Ratio	0.24	0.24	0.24		0.17	1.00	0.14	0.46		0.16	0.49	
Clearance Time (s)	3.5	4.6	4.6		4.0		3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5		2.0	2.5		3.0	2.5	PERSONAL PROPERTY.
Lane Grp Cap (vph)	201	447	379		256	1583	246	1636		556	1699	
v/s Ratio Prot	c0.03	0.11				1000	0.03	c0.41		c0.11	0.23	SEE SECTION .
v/s Ratio Perm	c0.15		0.01		0.12	0.39				00.11	0.20	
v/c Ratio	0.79	0.45	0.04		0.73	0.39	0.18	0.89		0.67	0.46	
Uniform Delay, d1	35.9	32.3	29.2		39.5	0.0	38.0	24.5		39.4	17.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.8	0.5	0.0		9.7	0.7	0.1	7.6		3.2	0.9	1000
Delay (s)	52.7	32.9	29.2		49.1	0.7	38.2	32.1		42.6	17.9	
Level of Service	D	C	C		D	Α	D	C		D	В	
Approach Delay (s)		39.6			11.9		en e	32.3			25.8	
Approach LOS		D			В			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.9	Н	CM 2000	Level of S	Service		С			
HCM 2000 Volume to Capa	acity ratio		0.84									The state of the s
Actuated Cycle Length (s)			100.0	Sı	um of lost	time (s)			16.3			
Intersection Capacity Utiliz	ation		80.7%			of Service			D			Street Street St.
Analysis Period (min)			15									CHARLES
c Critical Lane Group							1000000					



Site: El Rancho Dr/Sullivan Ln

Existing Plus Project Conditions - with Mitigation PM Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	El Rancho [Or NB									
8	T1	381	2.0	0.547	12.9	LOS B	2.4	61.6	0.56	0.60	30.5
18	R2	43	2.0	0.547	12.9	LOS B	2.4	61.6	0.56	0.60	29.9
Approa	ich	424	2.0	0.547	12.9	LOS B	2.4	61.6	0.56	0.60	30.4
East: S	Sullivan Ln W	/B									
1	L2	42	2.0	0.055	5.3	LOSA	0.2	4.7	0.43	0.34	31.7
16	R2	546	2.0	0.727	20.1	LOS C	6.2	157.4	0.79	0.90	27.0
Approa	ich	588	2.0	0.727	19.0	LOS C	6.2	157.4	0.77	0.86	27.3
North: I	El Rancho D	or SB									
7	L2	502	2.0	0.326	6.7	LOSA	1.5	39.3	0.17	0.07	31.5
4	T1	190	2.0	0.326	6.7	LOSA	1.5	39.3	0.17	0.07	32.3
Approa	ich	692	2.0	0.326	6.7	LOSA	1.5	39.3	0.17	0.07	31.7
All Vehi	icles	1703	2.0	0.727	12.5	LOSB	6.2	157.4	0.48	0.47	29.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

200	•	→	•	•	-	•	1	†	~	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	7	^	ř	7	1>		ሻሻ	†	7
Traffic Volume (vph)	92	1609	35	40	1151	278	52	152	38	276	121	197
Future Volume (vph)	92	1609	35	40	1151	278	52	152	38	276	121	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1807		3433	1863	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1807		3433	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	1694	37	42	1212	293	55	160	40	291	127	207
RTOR Reduction (vph)	0	0	17	0	0	100	0	7	0	0	0	169
Lane Group Flow (vph)	97	1694	20	42	1212	193	55	193	0	291	127	38
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	elesia		4			8	V Say S					6
Actuated Green, G (s)	19.2	74.2	74.2	7.4	62.7	62.7	7.1	20.6		12.3	25.8	25.8
Effective Green, g (s)	19.2	74.2	74.2	7.4	62.7	62.7	7.1	20.6		12.3	25.8	25.8
Actuated g/C Ratio	0.14	0.53	0.53	0.05	0.45	0.45	0.05	0.15		0.09	0.18	0.18
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	242	1875	838	93	1584	708	89	265		301	343	291
v/s Ratio Prot	0.05	c0.48		0.02	c0.34		0.03	c0.11		c0.08	c0.07	
v/s Ratio Perm			0.01			0.12						0.02
v/c Ratio	0.40	0.90	0.02	0.45	0.77	0.27	0.62	0.73		0.97	0.37	0.13
Uniform Delay, d1	55.1	29.7	15.7	64.3	32.5	24.3	65.1	57.0		63.6	50.0	47.7
Progression Factor	0.63	0.31	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	4.5	0.0	1.3	3.6	0.9	8.7	8.2		42.2	0.2	0.1
Delay (s)	35.0	13.8	15.7	65.6	36.0	25.2	73.8	65.2		105.9	50.2	47.8
Level of Service	D	В	В	E	D	C	Е	E		F	D	D
Approach Delay (s)		15.0	_	_	34.8			67.1			75.3	
Approach LOS		В			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			34.2	H	ICM 2000	Level of	Service	NE PAR	C			
HCM 2000 Volume to Capaci	ty ratio		0.89									
Actuated Cycle Length (s)			140.0		ium of los				25.5			
Intersection Capacity Utilizati	on		87.2%	10	CU Level	of Service)		E			
Analysis Period (min)			15									

	٠	→	•	•	←	•	1	†	~	>	ţ	1	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	7	^	7		र्स	7	*	† ‡		ሻሻ	†		
Traffic Volume (vph)	50	133	25	41	172	154	43	385	32	518	1380	124	
Future Volume (vph)	50	133	25	41	172	154	43	385	32	518	1380	124	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3		
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95		
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99		
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1752	1845	1568		1827	1568	1752	3464		3400	3461		
Flt Permitted	0.30	1.00	1.00		0.91	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	550	1845	1568		1683	1568	1752	3464		3400	3461		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	54	145	27	45	187	167	47	418	35	563	1500	135	
RTOR Reduction (vph)	0	0	20	0	0	135	0	7	0	0	6	0	
Lane Group Flow (vph)	54	145	7	0	232	32	47	446	0	563	1629	0	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	070	
Protected Phases	7	4			8	PIRION	5	2		1	6		
Permitted Phases	4		4	8		8					•		
Actuated Green, G (s)	23.9	23.9	23.9		17.1	17.1	2.7	30.5		22.2	50.0		
Effective Green, g (s)	23.9	23.9	23.9		17.1	17.1	2.7	30.5		22.2	50.0		
Actuated g/C Ratio	0.27	0.27	0.27		0.19	0.19	0.03	0.34		0.25	0.56		
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3		
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5		
Lane Grp Cap (vph)	198	489	416		319	297	52	1173		838	1922		
v/s Ratio Prot	0.01	c0.08					c0.03	0.13		0.17	c0.47		
v/s Ratio Perm	0.06		0.00		c0.14	0.02		0.10		0.17	00.47		
v/c Ratio	0.27	0.30	0.02		0.73	0.11	0.90	0.38		0.67	0.85		
Uniform Delay, d1	25.7	26.3	24.4		34.3	30.1	43.5	22.6		30.6	16.8		
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	16624	
Incremental Delay, d2	0.3	0.2	0.0		7.5	0.1	88.0	0.9		2.1	4.9	ESTER	
Delay (s)	25.9	26.6	24.4		41.8	30.3	131.5	23.5		32.7	21.7		
Level of Service	С	С	С		D	С	F	C		C	C		
Approach Delay (s)		26.2			37.0			33.7			24.5		
Approach LOS		С			D			C			C		
Intersection Summary												1000	
HCM 2000 Control Delay			27.5	НС	CM 2000	Level of S	Service		С			MED CYCLE	
HCM 2000 Volume to Capac	city ratio		0.80				THE REAL PROPERTY.			70 B		MATERIAL STATES	
Actuated Cycle Length (s)	-		90.0	Su	m of lost	time (s)		16.3					
Intersection Capacity Utilizat	tion		78.7%		U Level o			10000	D	1000			
Analysis Period (min)			15						U			A SECRET	
c Critical Lane Group													

Intersection						
Int Delay, s/veh	6.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WDL	NON	1 dvi	NOR	SDL T	<u>361</u>
Traffic Vol, veh/h	10	310	109	9	429	330
Future Vol, veh/h	10	310	109	9	429	330
Conflicting Peds, #/hr	0	0	0	0	429	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None			and the second second	
			•		200	
Storage Length	0		_	-	200	-
Veh in Median Storage			0	-	•	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	337	118	10	466	359
Major/Minor	Minor1	N	Major1		Major2	
Conflicting Flow All	1414	123	0	0	128	0
Stage 1	123	120	-	U	120	-
Stage 2	1291				_	
Critical Hdwy	6.42	6.22			4.12	
	5.42	0.22		•	4.12	
Critical Hdwy Stg 1	5.42					-
Critical Hdwy Stg 2	3.518				2.218	
Follow-up Hdwy						
Pot Cap-1 Maneuver	152	928			1458	
Stage 1	902				-	-
Stage 2	258	•	•	•		•
Platoon blocked, %				-	4450	-
Mov Cap-1 Maneuver	103	928			1458	
Mov Cap-2 Maneuver	103	-	-	-	-	-
Stage 1	902	•		•	•	•
Stage 2	176	-	-	-	-	-
Approach	WB		NB		SB	e vy
	14.1		0		4.9	
HCM Control Delay, s	14.1 B		U		4.9	
HCM LOS	D	35.00 S.00 S.00				
Minor Lane/Major Mvm	nt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)				742	1458	
HCM Lane V/C Ratio		-	-	0.469	0.32	-
HCM Control Delay (s)				14.1	8.6	
HCM Lane LOS		-	-	В	Α	-
HCM 95th %tile Q(veh)			2.5	1.4	
	A CONTRACTOR OF THE PARTY OF TH					

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥			4	4	
Traffic Vol, veh/h	5	8	5	315	433	5
Future Vol, veh/h	5	8	5	315	433	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	0.00		-			None
Storage Length	0	-	-	-	-	-
Veh in Median Storage				0	0	-
Grade, %	0	-		0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	9	6	362	498	6
Major/Minor	Line C		Material Control		4-1-0	
	Minor2		Major1		/lajor2	
Conflicting Flow All	875	501	503	0	-	0
Stage 1	501	•	•			
Stage 2	374	- 0.00	- 440		-	-
Critical Hdwy	6.42	6.22	4.12		•	
Critical Hdwy Stg 1	5.42	-	-		-	-
Critical Hdwy Stg 2	5.42	-		-	•	
Follow-up Hdwy		3.318		-	-	-
Pot Cap-1 Maneuver	320	570	1061		•	•
Stage 1	609			-	-	-
Stage 2	696					-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	318	570	1061			
Mov Cap-2 Maneuver	318		-	-	-	-
Stage 1	609				-	
Stage 2	691	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	13.5		0.1		0	
HCM LOS	В		J. 1		v	
Minor Lane/Major Mvm	t	NBL	NRT	EBLn1	SBT	SBR
Capacity (veh/h)		1061		437	-	JUIN -
HCM Lane V/C Ratio		0.005		0.034		
HCM Control Delay (s)		8.4	0	13.5	•	• •
HCM Lane LOS		Α	A	13.5 B	•	•
HCM 95th %tile Q(veh)		0	- A	0.1	-	
TOWN JOHN JOHNE CHIVEIN		U		0.1		

Intersection	77									1,000		
Int Delay, s/veh	1.7				es Subi Es S			TO STATE OF THE ST			TO SERVE	
	EBL	EDT	EDD	WDI	WDT	WAD	NDI	NOT	MDD	CDI	CDT	CDD
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	40	4	0.5		4		1	1			4	
Traffic Vol, veh/h	10	0	35	4	0	1	77	309	29	6	408	27
Future Vol, veh/h	10	0	35	4	0	1	77	309	29	6	408	27
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	-	-	-	-	-	-	140	-	-	-		-
Veh in Median Storage	,# -	0	-		0	-		0	-	•	0	
Grade, %		0	-	-	0	-	-	0	-	-	0	
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	41	5	0	1	90	359	34	7	474	31
Major/Minor	Minor2			Minor1			Major1		- 1	Major2		
Conflicting Flow All	1060	1076	490	1079	1075	376	506	0	0	393	0	0
Stage 1	504	504		555	555							
Stage 2	556	572	-	524	520	-		-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	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		4.018	3.318	2.218	-	-	2.218	-	
Pot Cap-1 Maneuver	202	219	578	196	220	670	1059			1166		
Stage 1	550	541	-	516	513	-	-	-	-		-	-
Stage 2	515	504		537	532							
Platoon blocked, %	310	301		301	302		323.50	-			-	
Mov Cap-1 Maneuver	187	199	578	169	200	670	1059			1166		
Mov Cap-1 Maneuver	187	199	-	169	200	-	-	_	-	-	-	-
Stage 1	503	537		472	469							
Stage 2	470	461	-	495	528	-	-	-	-	-	-	-
Market Sales												
	FP			MP			ND			SB		
Approach	EB			WB			NB 1.6					
HCM Control Delay, s	15.5			23.6		10.34	1.6			0.1		
HCM LOS	С			С					la se a se		58151	Jan de ja
	ESPECTS.											
Minor Lane/Major Mvn	nt	NBL	NBT	NBR	EBLn1V		SBL	SBT	SBR			
Capacity (veh/h)		1059			000	199	1166		-			
HCM Lane V/C Ratio		0.085	-	-	0.132			-	-			
HCM Control Delay (s)		8.7			15.5		8.1	0				
HCM Lane LOS		Α	-	-	С	С	Α	Α	-			
HCM 95th %tile Q(veh)	0.3			0.5	0.1	0	•				
•												

Movement Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Total Lost time (s) Lane Util. Factor	94 94 1900 5.4 1.00 1.00	855 855 855 1900 6.3	70 70 1900	WBL 56 56 1900	WBT 1908	WBR	NBL [*]	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Total Lost time (s)	94 94 1900 5.4 1.00	855 855 1900 6.3	70 70 1900	56 56	1908		ሻ	1		*		#
Future Volume (vph) Ideal Flow (vphpl) Total Lost time (s)	94 1900 5.4 1.00	855 1900 6.3	70 1900	56		00		-		1		7
Ideal Flow (vphpl) Total Lost time (s)	1900 5.4 1.00	1900	1900		4000	29	72	72	35	30	254	160
Total Lost time (s)	5.4 1.00	6.3		1000	1908	29	72	72	35	30	254	160
	1.00		0.0	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Litil Factor		0.04	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. I actui	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1772		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1772		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	100	910	74	60	2030	31	77	77	37	32	270	170
RTOR Reduction (vph)	0	0	36	0	0	16	0	14	0	0	0	135
Lane Group Flow (vph)	100	910	38	60	2030	15	77	100	0	32	270	35
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	1 OIIII
Permitted Phases		25	4			8	r restrict					6
Actuated Green, G (s)	11.6	67.2	67.2	7.9	63.5	63.5	7.4	28.2		4.7	24.5	24.5
Effective Green, g (s)	11.6	67.2	67.2	7.9	63.5	63.5	7.4	28.2		4.7	24.5	24.5
Actuated g/C Ratio	0.09	0.52	0.52	0.06	0.49	0.49	0.06	0.22		0.04	0.19	0.19
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	157	2628	818	107	2483	773	100	384		63	351	298
v/s Ratio Prot	c0.06	c0.18	0.0	0.03	c0.40	710	c0.04	0.06		0.02	c0.14	230
v/s Ratio Perm			0.02		00.10	0.01	00.01	0.00		0.02	00.14	0.02
v/c Ratio	0.64	0.35	0.05	0.56	0.82	0.02	0.77	0.26		0.51	0.77	0.12
Uniform Delay, d1	57.2	18.5	15.5	59.4	28.3	17.2	60.5	42.2		61.5	50.1	43.8
Progression Factor	1.00	1.00	1.00	0.46	1.67	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.1	0.4	0.1	2.4	1.9	0.0	27.6	0.1		2.3	8.8	0.1
Delay (s)	63.3	18.8	15.7	29.5	49.2	17.2	88.1	42.4		63.8	58.9	43.9
Level of Service	E	В	В	C	D	В	F	D		E	50.5 E	43.9 D
Approach Delay (s)		22.7			48.2			60.8			53.8	U
Approach LOS		C			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			42.4	L/	2M 2000	Level of S	Convice					
HCM 2000 Volume to Capacity	, ratio		0.78	П	JIVI 2000	Level of 3	bervice		D			
Actuated Cycle Length (s)	y Tallo		130.0	C	ım of loot	time (a)			00.0			
Intersection Capacity Utilization	n		78.6%		um of lost	f Service			23.0			
Analysis Period (min)			15	iC	O Level 0	o Service			D		TO COURSE	
c Critical Lane Group			10								ec s	

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^ ^	7	ሻ	^	7		4		7	4	7
Traffic Volume (vph)	66	820	34	49	1912	258	58	91	34	333	91	23
Future Volume (vph)	66	820	34	49	1912	258	58	91	34	333	91	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	0.97	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1787		1681	1720	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	0.97	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1787		1681	1720	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	837	35	50	1951	263	59	93	35	340	93	23
RTOR Reduction (vph)	0	0	19	0	0	75	0	8	0	0	0	19
Lane Group Flow (vph)	67	837	16	50	1951	188	0	179	0	214	219	4
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	8.2	58.8	58.8	7.1	58.0	58.0		17.5		21.1	21.1	21.1
Effective Green, g (s)	8.2	58.8	58.8	7.1	58.0	58.0		17.5		21.1	21.1	21.1
Actuated g/C Ratio	0.06	0.45	0.45	0.05	0.45	0.45		0.13		0.16	0.16	0.16
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0	1.	2.0	2.0	2.0
Lane Grp Cap (vph)	111	2299	716	96	2268	706		240		272	279	256
v/s Ratio Prot	c0.04	0.16		0.03	c0.38			c0.10		0.13	c0.13	
v/s Ratio Perm		HE LEGISTR	0.01			0.12						0.00
v/c Ratio	0.60	0.36	0.02	0.52	0.86	0.27		0.75		0.79	0.78	0.01
Uniform Delay, d1	59.3	23.3	19.7	59.8	32.4	22.6		54.1		52.3	52.3	45.7
Progression Factor	0.87	0.55	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	0.4	0.1	2.3	4.6	0.9		10.5		12.9	12.5	0.0
Delay (s)	57.8	13.3	19.7	62.1	36.9	23.5		64.6		65.2	64.8	45.7
Level of Service	Е	В	В	E	D	C		E		E	E	D
Approach Delay (s)		16.7			35.9			64.6			64.0	Jy-
Approach LOS		В			D			E			E	
Intersection Summary										1000		
HCM 2000 Control Delay			36.0	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capac	ity ratio		0.81									- 8
Actuated Cycle Length (s)	1000		130.0	Si	um of lost	time (s)			25.5			14 100
Intersection Capacity Utilizat	ion		81.4%			of Service			D	Cale day		
Analysis Period (min)			15									
c Critical Lane Group											14	

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7	3	र्स	7	*	†		44	†	
Traffic Volume (vph)	86	120	59	40	110	400	43	1161	34	271	818	50
Future Volume (vph)	86	120	59	40	110	400	43	1161	34	271	818	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1821	1568	1752	3490		3400	3475	
Flt Permitted	0.38	1.00	1.00		0.88	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	702	1845	1568		1630	1568	1752	3490		3400	3475	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	130	64	43	120	435	47	1262	37	295	889	54
RTOR Reduction (vph)	0	0	49	0	0	365	0	2	0	0	4	0
Lane Group Flow (vph)	93	130	15	0	163	70	47	1297	0	295	939	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	20.5	20.5	20.5		14.0	14.0	8.3	43.1		13.0	47.8	
Effective Green, g (s)	20.5	20.5	20.5		14.0	14.0	8.3	43.1		13.0	47.8	
Actuated g/C Ratio	0.23	0.23	0.23		0.16	0.16	0.09	0.48		0.14	0.53	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	-
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	201	420	357		253	243	161	1671		491	1845	
v/s Ratio Prot	c0.02	0.07		7 11			0.03	c0.37		c0.09	0.27	
v/s Ratio Perm	0.09		0.01		c0.10	0.04						
v/c Ratio	0.46	0.31	0.04		0.64	0.29	0.29	0.78		0.60	0.51	
Uniform Delay, d1	29.1	28.9	27.1		35.7	33.6	38.1	19.5		36.1	13.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1000
Incremental Delay, d2	0.6	0.3	0.0		4.9	0.5	0.4	3.6		2.1	1.0	
Delay (s)	29.7	29.2	27.1		40.6	34.1	38.5	23.1		38.1	14.6	
Level of Service	С	С	С		D	С	D	С		D	В	
Approach Delay (s)		28.9		5-15-15	35.8			23.6			20.2	
Approach LOS		С			D			С			С	
Intersection Summary						Syst 8						
HCM 2000 Control Delay			24.9	Н	CM 2000	Level of	Service		С	2) 17 12		
HCM 2000 Volume to Capa	acity ratio		0.71									
Actuated Cycle Length (s)			90.0	Si	um of lost	time (s)			16.3			
Intersection Capacity Utiliza	ation		76.2%			of Service			D			
Analysis Period (min)			15									The state of the s
c Critical Lane Group												25230

7.3					
WBL	WBR	NBT	NBR	SBL	SBT
¥		1+	Contract Contract	٦	†
10	307	305	25	277	175
	The second second		25		175
	0	0	0	0	0
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NEW YORK					None
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e.# 0		0		STATE OF THE PARTY OF	0
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Minor1	1	Major1		Major2	
1137	345	0	0	359	0
345	Harris .				
792	-			_	-
6.43	6.23			4.13	
	-	-		-	-
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	WBL 10 10 0 Stop - 0 e, # 0 92 3 11 Minor1 1137 345 792 6.43 5.43 5.43 3.527 222 715 444	WBL WBR 10 307 10 307 10 307 0 0 Stop Stop - None 0 - 9, # 0 - 92 92 3 3 11 334 Minor1 1137 345 345 - 792 - 6.43 6.23 5.43 - 5.43 - 3.527 3.327 222 696 715 - 444 - 166 696 166 - 715 - 332 - WB 17.3 C	WBL WBR NBT 10 307 305 10 307 305 0 0 0 0 Stop Stop Free None - 0 - 0 e, # 0 - 0 0 92 92 92 92 3 2 4 3	WBL WBR NBT NBR 10 307 305 25 10 307 305 25 0 0 0 0 Stop Stop Free Free - None - None - None 0 - 0 - 0 92 92 92 92 3 3 3 3 3 1137 345 0 0 345	WBL WBR NBT NBR SBL 10 307 305 25 277 10 307 305 25 277 0 0 0 0 0 0 Stop Stop Free Free

Intersection				74 a 64		
Int Delay, s/veh	0.4	The state of			THE PERSON	Mary Level
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥			4	4	
Traffic Vol, veh/h	1	15	11	316	300	2
Future Vol, veh/h	1	15	11	316	300	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop	None				
		None	*	None		
Storage Length	0		-	-	-	-
Veh in Median Storage	Carlo Control Control			0	0	
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	18	13	376	357	2
Major/Minor	Minor2		Major1	A	//ajor2	
	760	358	360			0
Conflicting Flow All				0	-	0
Stage 1	358					•
Stage 2	402	-	-	-		-
Critical Hdwy	6.42	6.22	4.12	-		
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42		-			
Follow-up Hdwy	3.518	3.318	2.218	-	-	
Pot Cap-1 Maneuver	374	686	1199			
Stage 1	707	-	-	-		-
Stage 2	676					
Platoon blocked, %				_	-	_
Mov Cap-1 Maneuver	369	686	1199		00/01/0	
Mov Cap-1 Maneuver	369	-	1133		-	
	707			-		
Stage 1		•	-			-
Stage 2	667	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	10.7		0.3		0	
HCM LOS	В		0.0		U	
TION EOO						
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1199				
HCM Lane V/C Ratio		0.011	-	0.029	-	-
HCM Control Delay (s)		8	0	10.7		
HCM Lane LOS		Α	Α	В	-	-
HCM 95th %tile Q(veh)	0	-	0.1		
					The State of the S	

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		*	1			4	
Traffic Vol, veh/h	10	0	80	30	1	15	60	302	10	4	307	4
Future Vol, veh/h	10	0	80	30	1	15	60	302	10	4	307	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		1000	None			None	-		None			None
Storage Length	-	-	-	-	-	-	140	-			-	
Veh in Median Storage	e,# -	0			0			0			0	
Grade, %	30 = 0	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	90	34	1	17	67	339	11	4	345	4
Major/Minor	Minor2			Minor1			Major1	e de la constante de la consta		Major2		
Conflicting Flow All	845	841	347	881	838	345	349	0	0	351	0	0
Stage 1	356	356		480	480							
Stage 2	489	485	-	401	358	-	-	-	_	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	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	283	301	696	267	302	698	1210			1208		
Stage 1	661	629	-	567	554	-	-	-	-	-	-	-
Stage 2	561	552		626	628							
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	263	283	696	222	284	698	1210			1208		
Mov Cap-2 Maneuver	263	283		222	284	-	-	-	-	-	-	-
Stage 1	624	626		536	523							
Stage 2	516	521	-	543	625	-	-	-		•		
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.4			20.3			1.3			0.1	AC 1572	
HCM LOS	В	DEID SEL		C		Carrott confi			OCCUPATION.			
Minor Lane/Major Mvm	nt .	NBL	NBT	NRP	EBLn1V	VRI n1	SBL	SBT	SBR	A Section		
Capacity (veh/h)	II.	1210	NDI	HOR	588	287	THE RESERVE OF THE PERSON NAMED IN	-	-			
HCM Lane V/C Ratio		0.056	-		0.172		0.004	-				
HCM Control Delay (s)	PA 32.35	8.2	HONE W	-	12.4	20.3	8	0				
HCM Lane LOS		Α.2		etaneri b	12.4 B	20.5 C	A	A	term in			
HCM 95th %tile Q(veh))	0.2			0.6	0.6	0			10/2015		
TOW JOHN JUNE QUEIN		U.L	- 10 - 16		0.0	3.0						

	١	→	•	1	←	•	4	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	7	^	7	ሻ	4		*	†	7
Traffic Volume (vph)	194	1404	18	60	1245	57	116	208	95	30	137	102
Future Volume (vph)	194	1404	18	60	1245	57	116	208	95	30	137	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1775		1770	1863	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1775		1770	1863	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	198	1433	18	61	1270	58	118	212	97	31	140	104
RTOR Reduction (vph)	0	0	9	0	0	32	0	13	0	0	0	89
Lane Group Flow (vph)	198	1433	9	61	1270	26	118	296	0	31	140	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4	7 01111	3	8	1 01111	5	2		1	6	
Permitted Phases			4		215 2	8		THE STATE OF				6
Actuated Green, G (s)	18.1	67.3	67.3	8.0	57.2	57.2	13.0	27.9		4.8	18.7	18.7
Effective Green, g (s)	18.1	67.3	67.3	8.0	57.2	57.2	13.0	27.9		4.8	18.7	18.7
Actuated g/C Ratio	0.14	0.52	0.52	0.06	0.44	0.44	0.10	0.21		0.04	0.14	0.14
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	246	2632	819	108	2237	696	177	380		65	267	227
v/s Ratio Prot	c0.11	c0.28	010	0.03	0.25	000	c0.07	c0.17		0.02	0.08	
v/s Ratio Perm	00.11	00.20	0.01	0.00	0.20	0.02	00.01	00.11		0.02	0.00	0.01
v/c Ratio	0.80	0.54	0.01	0.56	0.57	0.04	0.67	0.78		0.48	0.52	0.07
Uniform Delay, d1	54.2	21.1	15.2	59.3	27.2	20.7	56.4	48.2		61.4	51.5	48.1
Progression Factor	1.00	1.00	1.00	1.11	0.60	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.3	0.8	0.0	3.3	0.9	0.1	7.1	9.2		2.0	0.9	0.0
Delay (s)	70.5	21.9	15.2	69.0	17.3	20.8	63.6	57.4		63.4	52.4	48.1
Level of Service	E	C	В	E	В	C	E	E		E	D	D
Approach Delay (s)		27.6	No. of Contrast of		19.7		_	59.1			52.0	
Approach LOS		C			В			E			D	1
Intersection Summary												
HCM 2000 Control Delay			30.1	Н	CM 2000	Level of	Service		С			
HCM 2000 Volume to Capac	ity ratio		0.69		000	20.0101	25.1.00		•			
Actuated Cycle Length (s)			130.0	Si	um of los	time (s)			23.0			
Intersection Capacity Utilizat	ion		73.2%			of Service			D			740 - 20
Analysis Period (min)			15			3311100						
c Critical Lane Group									are an all property	2222011		BEST S. SAME

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^ ^	7	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	56	1411	62	26	1225	196	73	120	51	278	75	64
Future Volume (vph)	56	1411	62	26	1225	196	73	120	51	278	75	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.97	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1784		1681	1720	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.97	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1784		1681	1720	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	1534	67	28	1332	213	79	130	55	302	82	70
RTOR Reduction (vph)	0	0	37	0	0	82	0	8	0	0	0	60
Lane Group Flow (vph)	61	1534	30	28	1332	131	0	256	0	190	194	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	The same of the sa
Permitted Phases			4			8						6
Actuated Green, G (s)	7.9	57.6	57.6	4.6	54.6	54.6		23.0		19.3	19.3	19.3
Effective Green, g (s)	7.9	57.6	57.6	4.6	54.6	54.6		23.0		19.3	19.3	19.3
Actuated g/C Ratio	0.06	0.44	0.44	0.04	0.42	0.42		0.18		0.15	0.15	0.15
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	107	2253	701	62	2135	664		315		249	255	235
v/s Ratio Prot	c0.03	c0.30		0.02	0.26			c0.14		c0.11	0.11	
v/s Ratio Perm			0.02			0.08						0.01
v/c Ratio	0.57	0.68	0.04	0.45	0.62	0.20		0.81		0.76	0.76	0.04
Uniform Delay, d1	59.4	28.9	20.5	61.5	29.6	23.8		51.4		53.2	53.1	47.4
Progression Factor	1.12	1.12	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	1.5	0.1	1.9	1.4	0.7		13.9		11.7	11.4	0.0
Delay (s)	70.7	33.8	20.6	63.4	31.0	24.5		65.4		64.7	64.3	47.5
Level of Service	E	C	C	E	C	C		E		E	E	D
Approach Delay (s)		34.7			30.7			65.4			61.9	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			38.3	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capac	ity ratio		0.74									
Actuated Cycle Length (s)			130.0	St	um of lost	time (s)			25.5			
Intersection Capacity Utilizati	ion		68.4%			of Service			С			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7		4	7	7	† ‡		ሻሻ	† ‡	
Traffic Volume (vph)	145	183	64	70	125	564	41	1440	33	318	734	68
Future Volume (vph)	145	183	64	70	125	564	41	1440	33	318	734	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
FIt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1830	1583	1770	3527		3433	3494	
Flt Permitted	0.39	1.00	1.00		0.82	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	723	1863	1583		1520	1583	1770	3527		3433	3494	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	199	70	76	136	613	45	1565	36	346	798	74
RTOR Reduction (vph)	0	0	48	0	0	316	0	2	0	0	7	0
Lane Group Flow (vph)	158	199	22	0	212	297	45	1599	0	346	865	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	ALE TO
Protected Phases	7	4	1 OIIII	1 Onn	8	1 OIIII	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	27.7	27.7	27.7	•	20.3	20.3	6.7	35.9		13.0	42.2	
Effective Green, g (s)	27.7	27.7	27.7		20.3	20.3	6.7	35.9		13.0	42.2	
Actuated g/C Ratio	0.31	0.31	0.31		0.23	0.23	0.07	0.40		0.14	0.47	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	S. Section
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	274	573	487		342	357	131	1406	Y STATE OF	495	1638	
v/s Ratio Prot	c0.03	0.11	401		042	331	0.03	c0.45		c0.10	0.25	
v/s Ratio Perm	0.15	0.11	0.01		0.14	c0.19	0.00	CO.43		60.10	0.20	
v/c Ratio	0.58	0.35	0.04		0.62	0.83	0.34	1.14		0.70	0.53	
Uniform Delay, d1	26.1	24.1	21.9		31.4	33.2	39.6	27.1		36.6	16.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.3	0.0		2.9	14.9	0.6	71.1		4.3	1.2	21015
Delay (s)	27.9	24.4	21.9		34.2	48.1	40.1	98.1		40.9	18.1	
Level of Service	C	C	C		C	D	D	50.1		D	В	
Approach Delay (s)	U	25.3	U		44.6	U		96.5		D	24.6	
Approach LOS		C			D			50.5			24.0	
		•						•			·	
Intersection Summary HCM 2000 Control Delay			57.4	U	CM 2000	Level of	Contino		E			
HCM 2000 Volume to Capa	city ratio		0.94	П	CIVI 2000	Level of	Service		E			
Actuated Cycle Length (s)	icity ratio		90.0	0	um of los	t time (a)			16.0			No. of Concession, Name of Street, or other
Intersection Capacity Utiliza	ation		97.0%		um of los	of Service			16.3			
Analysis Period (min)	ZUUI I		15	IC	O Level	oi Service		Name and Address of the Owner, where	F			CONTRACTOR OF THE PARTY OF THE
c Critical Lane Group			15									

Intersection						
Int Delay, s/veh	18.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		1>		*	↑
Traffic Vol, veh/h	10	436	414	20	389	209
Future Vol, veh/h	10	436	414	20	389	209
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	200	-
Veh in Median Storage			0			0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mymt Flow	11	474	450	22	423	227
			100		120	
	Minor1		Najor1		Major2	
Conflicting Flow All	1534	461	0	0	472	0
Stage 1	461					
Stage 2	1073	-	-	-	-	-
Critical Hdwy	6.42	6.22			4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42			-		
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	128	600			1090	
Stage 1	635	-	-	-	-	
Stage 2	328	-				
Platoon blocked, %			_	-		-
Mov Cap-1 Maneuver	78	600			1090	
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	635	-				
Stage 2	201	_	_	-		-
Olago 2						
Approach	WB		NB		SB	
HCM Control Delay, s	51.9		0		6.8	
HCM LOS	F					
Minor Lane/Major Mvm	t	NBT	NRRV	VBLn1	SBL	SBT
Capacity (veh/h)		INDI	-		1090	-
HCM Lane V/C Ratio				0.929		-
				51.9	10.4	
HCM Control Delay (s) HCM Lane LOS		•		51.9 F	В	-
HCM 95th %tile Q(veh)		9652		100 Sec. 19 19	1.9	
How sour wille Q(ven)				11.4	1.9	

Intersection						
Int Delay, s/veh	0.4		Comment of the			
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y	LDIX	NDL	HOI!	100	ODIN
Traffic Vol, veh/h	5	10	15		404	5
		10	15 15	441	404	5
Future Vol, veh/h	5			441		
Conflicting Peds, #/hr	O Cton	O Cton	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None		None		
Storage Length	0	-	-	-		-
Veh in Median Storage				0	0	
Grade, %	0		-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	11	17	501	459	6
Major/Mines	Minor		Majort		Anion	175 80
	Minor2		Major1		Major2	_
Conflicting Flow All	997	462	465	0		0
Stage 1	462					-
Stage 2	535		-			
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318		-	-	-
Pot Cap-1 Maneuver	271	600	1096			
Stage 1	634	-	-	-	-	-
Stage 2	587					
Platoon blocked, %				-		-
Mov Cap-1 Maneuver	265	600	1096			
Mov Cap-2 Maneuver	265		-	-	-	-
Stage 1	634					
Stage 2	575					
Olago Z	313					
	8518797					
Approach	EB		NB		SB	
HCM Control Delay, s	13.9		0.3		0	
HCM LOS	В					
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1096				
HCM Lane V/C Ratio		0.016		0.04	-	
HCM Control Delay (s		8.3	0	13.9		
HCM Lane LOS		Α	A	В		-
HCM 95th %tile Q(veh)	0	^	0.1		
	,	U	E0 1025	0.1		

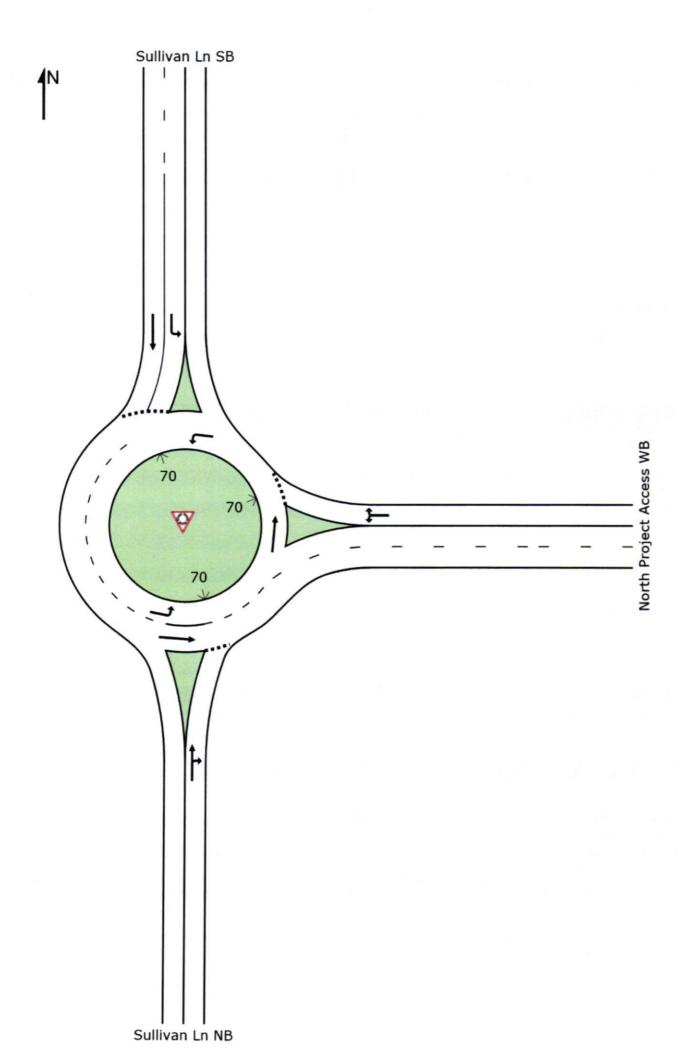
Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR	Intersection												
Lane Configurations	and the second s	4.3	III. Mirror Carrier				and the second	urbinist (III)	T. D. S. O'S. A. S.	A Section of	- Andrews		
Lane Configurations	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	Control of the Contro		4			4		ሻ	1+			4	
Future Vol, veh/h		21	-	150	35	_	4	-		30	10		10
Conflicting Peds, #/hr	PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PR		STREET, STREET,		100 000 RES								
Sign Control Stop RT Channelized Stop None Free None Free Free Free Free Free Free None Free Free Free Free Free Free Free None		4,000,00	10.70	100000000000000000000000000000000000000	- A								
RT Channelized - None - None - None - None - None Storage Length				AND DESCRIPTION OF THE PERSON NAMED IN		A COLUMN TWO IS NOT THE OWNER.		Control of the last					
Storage Length		The second second	OR STREET, SQUARE,		AND DESCRIPTION OF THE PERSONS ASSESSMENT	CONTRACTOR STORY		SECTION AND ADDRESS OF THE PARTY OF THE PART	NAME OF TAXABLE PARTY.		NAME OF TAXABLE PARTY.	SOUTH PARTY	
Veh in Median Storage, # 0 - 1 0 - 0 - 0 - 0 0 4 1 1 0 0 4 1 1 0 0 0 2 <td>THE RESIDENCE AND ADDRESS OF THE PARTY OF TH</td> <td>_</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	THE RESIDENCE AND ADDRESS OF THE PARTY OF TH	_	-	-	-	-							
Grade, % - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - 95 97 0 0 2 2 2		e.# -	0			0		STATE OF THE REAL PROPERTY.	0			0	
Peak Hour Factor 95		-, "	STATISTICS.						- 1 1 1 1 1 A 3 7 A		177	1000	0.000
Heavy Vehicles, % 2 2 2 2 2 2 2 2 2	Activity September 10000	95	100	95			95						
Mymt Flow 22 0 158 37 1 4 58 454 32 11 415 11 Major/Minor Minor1 Major1 Major2 Conflicting Flow All 1029 1042 420 1105 1031 469 425 0 0 485 0 0 Stage 1 441 441 - 585 585 -	Control of the Contro					A PERSONAL PROPERTY.							
Major/Minor Minor2 Minor1 Major1 Major2													
Conflicting Flow All 1029 1042 420 1105 1031 469 425 0 0 485 0 0 Stage 1 441 441 - 585 585 Stage 2 588 601 - 520 446 Critical Hdwy 7.12 6.52 6.22 7.12 6.52 6.22 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 Critical Hdwy Stg 2 6.12 5.52 - 6.12 5.52 Critical Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218 Follow-up Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218 Stage 1 595 577 - 497 498 Stage 2 495 489 - 539 574 Stage 2 495 489 - 539 574 Platoon blocked, % Mov Cap-1 Maneuver 200 215 633 134 218 594 1134 - 1078 Stage 1 565 569 - 472 473 Stage 2 465 464 - 399 567 Approach EB WB NB SB HCM Control Delay, s 16.2 HCM LOS C E				,00	01			00	.07	OL.		.10	
Conflicting Flow All 1029 1042 420 1105 1031 469 425 0 0 485 0 0 Stage 1 441 441 - 585 585 Stage 2 588 601 - 520 446 Critical Hdwy 7.12 6.52 6.22 7.12 6.52 6.22 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 Critical Hdwy Stg 2 6.12 5.52 - 6.12 5.52 Critical Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218 Follow-up Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218 Stage 1 595 577 - 497 498 Stage 2 495 489 - 539 574 Stage 2 495 489 - 539 574 Platoon blocked, % Mov Cap-1 Maneuver 200 215 633 134 218 594 1134 - 1078 Stage 1 565 569 - 472 473 Stage 2 465 464 - 399 567 Approach EB WB NB SB HCM Control Delay, s 16.2 HCM LOS C E	Major/Minor	Minor2			Minor1			Major1			Major2		
Stage 1 441 441 - 585 585		1029	1042	420	1105	1031			0			0	0
Stage 2 588 601 - 520 446				Name and Address of the Owner, where					and the same of th				Name and Address of the Owner, where the Owner, which the Owner, where the Owner, which the
Critical Hdwy 7.12 6.52 6.22 7.12 6.52 6.22 4.12 - 4.12 Critical Hdwy Stg 1 6.12 5.52 - 6.12 5.52				-			-	-	-	-	-	-	-
Critical Hdwy Stg 1 6.12 5.52 - 6.12 5.52				6.22			6.22	4.12			4.12	THE RESIDENCE OF THE PERSON NAMED IN	and a state of the
Critical Hdwy Stg 2 6.12 5.52 - 6.12 5.52	The state of the s			-			-	-	-	-	-	-	-
Follow-up Hdwy 3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218 2.218 Pot Cap-1 Maneuver 212 230 633 188 233 594 1134 - 1078 - Stage 1 595 577 - 497 498				St.									
Pot Cap-1 Maneuver 212 230 633 188 233 594 1134 - 1078 -	The second secon			3.318			3.318	2.218	-		2.218	-	-
Stage 1 595 577 - 497 498													
Stage 2 495 489 - 539 574							-	-	-	-	-		S. Alexander
Platoon blocked, % Mov Cap-1 Maneuver 200 215 633 134 218 594 1134 - 1078 - Mov Cap-2 Maneuver 200 215 - 134 218 Stage 1 565 569 - 472 473 Stage 2 465 464 - 399 567 Approach EB WB NB SB HCM Control Delay, s 16.2 39 0.9 0.2 HCM LOS C E									13.			-	
Mov Cap-1 Maneuver 200 215 633 134 218 594 1134 - 1078 - - Mov Cap-2 Maneuver 200 215 - 134 218 -									-	-		-	-
Mov Cap-2 Maneuver 200 215 - 134 218 - </td <td>Commence of the Commence of th</td> <td>200</td> <td>215</td> <td>633</td> <td>134</td> <td>218</td> <td>594</td> <td>1134</td> <td></td> <td></td> <td>1078</td> <td></td> <td></td>	Commence of the Commence of th	200	215	633	134	218	594	1134			1078		
Stage 1 565 569 - 472 473	Control of the Contro						-	-	-	-	-	-	-
Stage 2 465 464 - 399 567							-						
Approach EB WB NB SB HCM Control Delay, s 16.2 39 0.9 0.2 HCM LOS C E	The state of the s			-			-		-	-			-
HCM Control Delay, s 16.2 39 0.9 0.2 HCM LOS C E													
HCM LOS C E	Approach	EB	333		WB			NB			SB		
HCM LOS C E	HCM Control Delay, s	16.2			39			0.9			0.2		
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR					Е								
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR													
		nt		NBT	NBR				SBT	SBR			
Capacity (veh/h) 1134 500 147 1078													
HCM Lane V/C Ratio 0.051 0.36 0.286 0.01				-	-					-			
HCM Control Delay (s) 8.3 16.2 39 8.4 0 -)											
HCM Lane LOS A C E A A -				-	-								
HCM 95th %tile Q(veh) 0.2 1.6 1.1 0	HCM 95th %tile Q(veh	1)	0.2		•	1.6	1.1	0		*			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7	ሻ	1		ሻ	†	7
Traffic Volume (vph)	201	1951	66	60	1552	70	115	311	90	40	108	126
Future Volume (vph)	201	1951	66	60	1552	70	115	311	90	40	108	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1800		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1800		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	207	2011	68	62	1600	72	119	321	93	41	111	130
RTOR Reduction (vph)	0	0	36	0	0	43	0	8	0	0	0	118
Lane Group Flow (vph)	207	2011	32	62	1600	29	119	406	0	41	111	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.7	61.8	61.8	8.4	52.5	52.5	24.7	31.4		6.4	12.1	12.1
Effective Green, g (s)	17.7	61.8	61.8	8.4	52.5	52.5	24.7	31.4		6.4	12.1	12.1
Actuated g/C Ratio	0.14	0.48	0.48	0.06	0.40	0.40	0.19	0.24		0.05	0.09	0.09
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	240	2417	752	114	2053	639	336	434		87	173	147
v/s Ratio Prot	0.12	c0.40		0.04	c0.31		c0.07	c0.23		0.02	0.06	
v/s Ratio Perm			0.02			0.02						0.01
v/c Ratio	0.86	0.83	0.04	0.54	0.78	0.05	0.35	0.93		0.47	0.64	0.08
Uniform Delay, d1	55.0	29.6	18.3	58.9	33.7	23.5	45.7	48.3		60.2	56.9	53.9
Progression Factor	1.00	1.00	1.00	1.15	1.26	17.28	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.0	3.5	0.1	1.8	2.0	0.1	0.2	27.0		1.5	6.0	0.1
Delay (s)	80.0	33.1	18.4	69.8	44.3	406.7	46.0	75.3		61.6	62.8	54.0
Level of Service	F	C	В	E	D	F	D	E		E	E	D
Approach Delay (s)		36.9			60.2			68.8			58.6	
Approach LOS		D			E			E			E	
Intersection Summary							27.5					
HCM 2000 Control Delay			50.1	Н	CM 2000	Level of	Service		D			
HCM 2000 Volume to Capa	city ratio		0.86									
Actuated Cycle Length (s)			130.0	S	um of los	t time (s)			23.0			
Intersection Capacity Utiliza	tion		87.9%	IC	U Level	of Service)		Е			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	71	1955	55	77	1419	271	88	174	77	268	136	175
Future Volume (vph)	71	1955	55	77	1419	271	88	174	77	268	136	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1782		1681	1740	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1782		1681	1740	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	2058	58	81	1494	285	93	183	81	282	143	184
RTOR Reduction (vph)	0	0	38	0	0	109	0	9	0	0	0	152
Lane Group Flow (vph)	75	2058	20	81	1494	176	0	348	0	209	216	32
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4	-12	3	8		2	2		6	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	8.2	44.9	44.9	9.7	46.7	46.7		28.8		21.1	21.1	21.1
Effective Green, g (s)	8.2	44.9	44.9	9.7	46.7	46.7		28.8		21.1	21.1	21.1
Actuated g/C Ratio	0.06	0.35	0.35	0.07	0.36	0.36		0.22		0.16	0.16	0.16
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	111	1756	546	132	1826	568		394		272	282	256
v/s Ratio Prot	0.04	c0.40		0.05	c0.29			c0.20		c0.12	0.12	
v/s Ratio Perm	Harris .		0.01			0.11						0.02
v/c Ratio	0.68	1.17	0.04	0.61	0.82	0.31		0.88		0.77	0.77	0.13
Uniform Delay, d1	59.6	42.5	28.2	58.3	37.8	30.0		49.0		52.1	52.1	46.6
Progression Factor	0.50	0.39	1.00	1.00	1.00	1.00		1.00		0.99	0.99	0.94
Incremental Delay, d2	7.5	81.4	0.1	5.8	4.2	1.4		19.8		11.1	10.6	0.1
Delay (s)	37.3	98.2	28.3	64.2	42.0	31.4		68.8		62.7	62.2	43.9
Level of Service	D	F	C	E	D	C		E		E	E	D
Approach Delay (s)		94.3			41.4			68.8			56.8	
Approach LOS		F			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			68.3	Н	CM 2000	Level of S	Service		E			
HCM 2000 Volume to Capaci	ty ratio		1.00									
Actuated Cycle Length (s)			130.0	S	um of lost	time (s)			25.5			
Intersection Capacity Utilization	on		93.0%			of Service	4		F			
Analysis Period (min)			15									
c Critical Lane Group												

EBR 7 25 25	EBR 1					•			▼	•
25		WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	7		र्स	7	ሻ	4 \$		77	↑ ↑	
25	25	48	183	318	43	385	47	851	1380	124
	25	48	183	318	43	385	47	851	1380	124
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
0.85	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
1568	1568		1826	1568	1752	3443		3400	3461	
1.00	1.00		0.90	1.00	0.95	1.00		0.95	1.00	
1568	1568		1661	1568	1752	3443		3400	3461	
0.89	0.89	0.92	0.90	0.82	0.90	0.92	0.84	0.84	0.92	0.91
28	28	52	203	388	48	418	56	1013	1500	136
20	20	0	0	308	0	12	0	0	6	0
8	8	0	255	80	48	462	0	1013	1630	0
3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Perm	Perm F	Perm	NA	Perm	Prot	NA		Prot	NA	
			8		5	2		1	6	HERE
4	4	8		8						
24.7	24.7		18.6	18.6	3.2	19.2		32.7	48.7	
24.7	24.7		18.6	18.6	3.2	19.2		32.7	48.7	
0.27	0.27		0.21	0.21	0.04	0.21		0.36	0.54	
4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
430	430		343	324	62	734		1235	1872	
					c0.03	0.13		0.30	c0.47	
0.00	0.00		c0.15	0.05						
0.02	0.02		0.74	0.25	0.77	0.63		0.82	0.87	
23.8	23.8		33.5	29.8	43.0	32.2		26.0	17.9	
1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
0.0	0.0		8.0	0.3	41.1	4.1		4.5	5.9	
23.8			41.5	30.1	84.1	36.2		30.5	23.8	
С	C		D	С	F	D		С	С	
			34.6			40.6			26.4	
			C			D			С	
									1000	
29.5	29.5	HC	M 2000	Level of S	Service		С			
0.82	0.82									
90.0							16.3			
80.8%		ICU	Level o	f Service			D			
15	15									
		0.82 90.0 80.8%	0.82 90.0 Sun 80.8% ICU	0.82 90.0 Sum of lost 80.8% ICU Level of	0.82 90.0 Sum of lost time (s) 80.8% ICU Level of Service	0.82 90.0 Sum of lost time (s) 80.8% ICU Level of Service	0.82 90.0 Sum of lost time (s) 80.8% ICU Level of Service	0.82 90.0 Sum of lost time (s) 16.3 80.8% ICU Level of Service D	0.82 90.0 Sum of lost time (s) 16.3 80.8% ICU Level of Service D	0.82 90.0 Sum of lost time (s) 16.3 80.8% ICU Level of Service D

Intersection						
Int Delay, s/veh	2042.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥	THE I	1	HOIL) T	A
Traffic Vol, veh/h	83	492	109	157	799	330
Future Vol, veh/h	83	492	109	157	799	330
Conflicting Peds, #/hr		0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None	riee -	THE RESERVE AND ADDRESS OF THE PARTY OF THE		None
AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUM	0	NONE -	0.000	None	200	
Storage Length		-	-			-
Veh in Median Storag			0			0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	85	91	77	83	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	579	120	204	963	359
Major/Minor	Minor1		Major1		Major2	
						_
Conflicting Flow All	2506	222	0	0	324	0
Stage 1	222					•
Stage 2	2284	-	-		-	-
Critical Hdwy	6.42	6.22			4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy	3.518	3.318	-	-	2.218	
Pot Cap-1 Maneuver	~31	818			1236	
Stage 1	815	-	-	-	-	-
Stage 2	~82					
Platoon blocked, %	-		_	_		-
Mov Cap-1 Maneuver	~7	818			1236	
		The State of the last	300			
Mov Cap-2 Maneuver		-	-	-	-	-
Stage 1	815		•	•		
Stage 2	~ 18	-	-	-	-	-
Approach	WB	No.	NB	(7.4.T.)	SB	
	A CONTRACTOR OF THE PARTY OF TH					
HCM Control Delay,\$			0		12.6	
HCM LOS	F					
Minor Lane/Major Mvr	nt	NBT	NBRV	/BI n1	SBL	SBT
Capacity (veh/h)				43	1236	
HCM Lane V/C Ratio				5.968		
	,	-				-
HCM Control Delay (s HCM Lane LOS)	•	40	912.4	17.3	•
HI MI DOD I (IS	-\	-	NO THE REAL PROPERTY.	F	C	distanti
	The second second second			83.5	8.5	
HCM 95th %tile Q(veh	1)					
HCM 95th %tile Q(veh	1)					
		\$: De	elay exc	eeds 3	00s	+: Comp



Site: Sullivan Ln/North Project Access

2040 Plus Project Conditions AM Peak Hour Roundabout

Move	ment Perfo	rmance - Ve	hicles								
Mov ID	OD Mov	Demand Total veh/h	I Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	Sullivan Ln	NB									
8	T1	467	2.0	0.703	17.8	LOSC	4.3	109.7	0.66	0.73	28.8
18	R2	100	2.0	0.703	17.8	LOS C	4.3	109.7	0.66	0.73	28.2
Approa	ach	567	2.0	0.703	17.8	LOS C	4.3	109.7	0.66	0.73	28.7
East: N	North Project	Access WB									
1	L2	48	2.0	0.388	10.4	LOS B	1.7	42.9	0.59	0.60	31.2
16	R2	219	2.0	0.388	10.4	LOS B	1.7	42.9	0.59	0.60	30.6
Approa	ach	267	2.0	0.388	10.4	LOS B	1.7	42.9	0.59	0.60	30.7
North:	Sullivan Ln S	SB									
7	L2	444	2.0	0.421	8.0	LOSA	2.3	58.0	0.22	0.10	30.8
4	T1	724	2.0	0.687	14.0	LOS B	6.3	160.1	0.37	0.17	30.2
Approa	ich	1168	2.0	0.687	11.7	LOS B	6.3	160.1	0.31	0.14	30.5
All Veh	icles	2002	2.0	0.703	13.3	LOSB	6.3	160.1	0.45	0.37	30.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, January 04, 2019 4:39:19 PM SIDRA INTERSECTION 6.0.24.4877

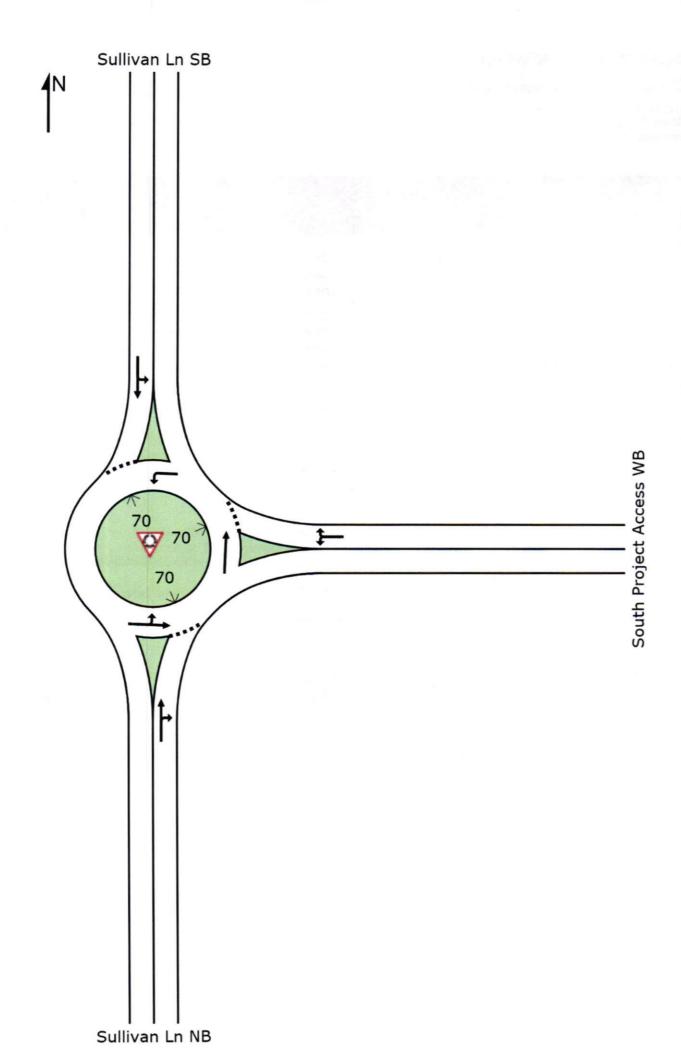
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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\2040PP-AM.sip6

8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

SIDRA INTERSECTION 6

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
	Y	EDR	NDL	ND1	100	ODK
Lane Configurations		0	-			-
Traffic Vol, veh/h	5	8	5	480	655	5
Future Vol, veh/h	5	8	5	480	655	5
Conflicting Peds, #/hr	0	0	0	0	_ 0	_ 0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		
Storage Length	0	-	-	-	-	-
Veh in Median Storage	The state of the s			0	0	
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	82	83	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	9	6	585	789	6
VI-lash Basa	LC		Madage	VISION NO.	And and	A CONTRACTOR
The same of the sa	Minor2		Major1		Major2	
Conflicting Flow All	1389	792	795	0	-	0
Stage 1	792					
Stage 2	597	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318	2.218		-	-
Pot Cap-1 Maneuver	157	389	826		-	
Stage 1	446	-	-	_	-	
Stage 2	550					
Platoon blocked, %	500					-
Mov Cap-1 Maneuver	155	389	826			
Mov Cap-1 Maneuver	155	303	020	-		
					-	-
Stage 1	446	•	-			•
Stage 2	544	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	20.6		0.1	- CALLER	0	
HCM LOS	C		0.1		U	
TIOWI LOG	U					
		The second second	AND DESCRIPTION	and the same of the		TAX STORY
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		826		246		
HCM Lane V/C Ratio		0.007	-	0.061	-	-
HCM Control Delay (s)		9.4	0	20.6		
HCM Lane LOS		Α	Α	С	-	-
HCM 95th %tile Q(veh)	0		0.2		



Site: Sullivan Ln/South Project Access

2040 Plus Project Conditions AM Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	Sullivan Ln I	NB					医肾炎病性2年				
8	T1	448	2.0	0.746	19.1	LOS C	7.4	188.1	0.77	0.75	28.3
18	R2	195	2.0	0.746	19.1	LOS C	7.4	188.1	0.77	0.75	27.7
Approa	ch	642	2.0	0.746	19.1	LOS C	7.4	188.1	0.77	0.75	28.1
East: S	outh Project	Access WB									
1	L2	96	2.0	0.308	8.9	LOS A	1.2	30.8	0.55	0.54	31.3
16	R2	120	2.0	0.308	8.9	LOSA	1.2	30.8	0.55	0.54	30.8
Approa	ch	216	2.0	0.308	8.9	LOSA	1.2	30.8	0.55	0.54	31.0
North:	Sullivan Ln S	SB									
7	L2	247	2.0	0.769	18.2	LOS C	8.0	202.3	0.62	0.38	28.0
4	T1	525	2.0	0.769	18.2	LOS C	8.0	202.3	0.62	0.38	28.1
Approa	ch	772	2.0	0.769	18.2	LOS C	8.0	202.3	0.62	0.38	28.1
All Vehi	icles	1630	2.0	0.769	17.3	LOSC	8.0	202.3	0.67	0.55	28.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, January 04, 2019 4:41:11 PM SIDRA INTERSECTION 6.0.24.4877

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8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\2040PP-AM.sip6

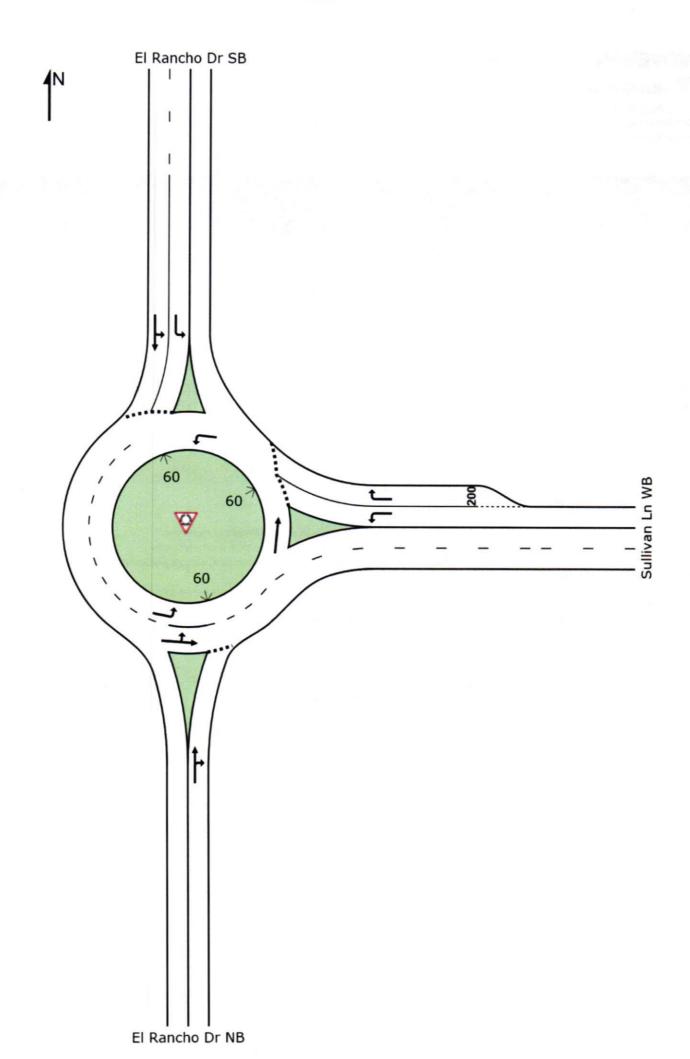
SIDRA INTERSECTION 6

Intersection								12 A C					
Int Delay, s/veh	1.6	in the later parties											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4	LUIT	HUL	4	TIDIN	7	1	HUIT	ODL	4	ODIN	
Traffic Vol, veh/h	10	0	35	4	0	1	77	531	29	6	518	27	
Future Vol, veh/h	10	0	35	4	0	1	77	531	29	6	518	27	
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		1	None	0.00	Olop	None			None	-	-		
Storage Length						-	140	-	-	-	-	-	
Veh in Median Storage	.# -	0			0			0			0		
Grade, %	-	0	-		0		-	0	-	-	0	_	
Peak Hour Factor	83	86	86	86	86	86	86	81	86	75	83	84	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	12	0	41	5	0	1	90	656	34	8	624	32	
Major/Minor I	Minor2			Minor1			Major1		1000	Major2			
Conflicting Flow All	1508	1524	640	1528	1523	672	656	0	0	689	0	0	
Stage 1	656	656		851	851								
Stage 2	852	868		677	672		-	-	-			_	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	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					1			
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218		-	2.218	-	-	
Pot Cap-1 Maneuver	99	118	475	96	118	456	931			905		-	
Stage 1	454	462	-	355	376	-	-	-	-	-	-	-	
Stage 2	354	370		443	454							-	
Platoon blocked, %								-			-	-	
Mov Cap-1 Maneuver	90	105	475	80	105	456	931			905			
Mov Cap-2 Maneuver	90	105	-	80	105	-	-	-	-	-	-	-	
Stage 1	410	456		321	340								
Stage 2	319	334	-	399	448	-	-		-	-	-	-	
Approach	EB			WB			NB	5633		SB			
HCM Control Delay, s	24.2			44.9			1.1			0.1			
HCM LOS	С			Ε									
Minor Lane/Major Mvm	t	NBL	NBT	NBR	EBLn1V		SBL	SBT	SBR				
Capacity (veh/h)		931			240	96	905						
HCM Lane V/C Ratio		0.096	-	•		0.061	0.009	-	-				
HCM Control Delay (s)		9.3			24.2	44.9	9	0					
HCM Lane LOS		Α	-	-	С	Е	Α	Α	-				
HCM 95th %tile Q(veh)	W-18-18-18-18-18-18-18-18-18-18-18-18-18-	0.3			0.8	0.2	0	200					

	•	\rightarrow	•	•	←	•	1	†	-	-	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	ተተተ	7	ሻ	^	7	ሻ	1>		ሻ	†	7
Traffic Volume (vph)	168	892	70	93	1926	29	72	146	109	30	290	197
Future Volume (vph)	168	892	70	93	1926	29	72	146	109	30	290	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1741		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1741		1770	1863	1583
Peak-hour factor, PHF	0.84	0.93	0.92	0.86	0.94	0.91	0.94	0.83	0.80	0.94	0.91	0.90
Adj. Flow (vph)	200	959	76	108	2049	32	77	176	136	32	319	219
RTOR Reduction (vph)	0	0	41	0	0	19	0	23	0	0	0	142
Lane Group Flow (vph)	200	959	35	108	2049	13	77	289	0	32	319	77
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4	1 OIIII	3	8	1 01111	5	2		1	6	1 Olilli
Permitted Phases		ALCOHOL:	4			8		ere e	P. River			6
Actuated Green, G (s)	20.3	60.3	60.3	11.5	51.5	51.5	7.4	31.5		4.7	27.8	27.8
Effective Green, g (s)	20.3	60.3	60.3	11.5	51.5	51.5	7.4	31.5		4.7	27.8	27.8
Actuated g/C Ratio	0.16	0.46	0.46	0.09	0.40	0.40	0.06	0.24		0.04	0.21	0.21
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	276	2358	734	156	2014	627	100	421		63	398	338
v/s Ratio Prot	c0.11	0.19	101	0.06	c0.40	021	c0.04	0.17		0.02	c0.17	000
v/s Ratio Perm	00.11	0.10	0.02	0.00	00.10	0.01	00.04	0.17		0.02	00.11	0.05
v/c Ratio	0.72	0.41	0.05	0.69	1.02	0.02	0.77	0.69		0.51	0.80	0.23
Uniform Delay, d1	52.2	23.0	19.1	57.5	39.2	23.9	60.5	44.8		61.5	48.5	42.2
Progression Factor	1.00	1.00	1.00	0.50	1.26	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.8	0.5	0.1	1.0	11.1	0.0	27.6	3.7		2.3	10.5	0.1
Delay (s)	59.9	23.6	19.2	29.6	60.6	23.9	88.1	48.5		63.8	58.9	42.3
Level of Service	E	C	В	C	E	C	F	D		E	E	D
Approach Delay (s)		29.2	_	•	58.5			56.3			52.8	
Approach LOS		C	985		E			E			D	
Intersection Summary												
HCM 2000 Control Delay			49.3	Н	CM 2000	Lovel of	Sonico		D			
HCM 2000 Volume to Capac	rity ratio		0.89		CIVI 2000	Level UI	DEI VICE		D			
Actuated Cycle Length (s)	nty ratio		130.0	C.	um of lost	time (c)			22.0			
Intersection Capacity Utilizat	tion		84.9%		U Level			NO BELLET	23.0 E			
Analysis Period (min)			15	10	O LEVEL	JI GEI VICE			Е			No. of Concession,
c Critical Lane Group			10							10000		

	٠	→	•	•	←	•	4	†	<i>></i>	-	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7		4		ሻ	4	7
Traffic Volume (vph)	177	820	34	49	1912	295	58	165	34	351	128	78
Future Volume (vph)	177	820	34	49	1912	295	58	165	34	351	128	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1812		1681	1730	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1812		1681	1730	1583
Peak-hour factor, PHF	0.82	0.98	0.94	0.94	0.98	0.95	0.97	0.86	0.94	0.96	0.91	0.81
Adj. Flow (vph)	216	837	36	52	1951	311	60	192	36	366	141	96
RTOR Reduction (vph)	0	0	22	0	0	109	0	4	0	0	0	79
Lane Group Flow (vph)	216	837	14	52	1951	202	0	284	0	249	258	17
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	22.0	49.5	49.5	6.7	34.5	34.5		24.7		23.6	23.6	23.6
Effective Green, g (s)	22.0	49.5	49.5	6.7	34.5	34.5		24.7		23.6	23.6	23.6
Actuated g/C Ratio	0.17	0.38	0.38	0.05	0.27	0.27		0.19		0.18	0.18	0.18
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	299	1936	602	91	1349	420		344	19 641	305	314	287
v/s Ratio Prot	c0.12	0.16		0.03	c0.38			c0.16		0.15	c0.15	
v/s Ratio Perm			0.01			0.13						0.01
v/c Ratio	0.72	0.43	0.02	0.57	1.45	0.48		0.83		0.82	0.82	0.06
Uniform Delay, d1	51.1	29.8	25.1	60.2	47.8	40.2		50.6		51.1	51.2	44.0
Progression Factor	0.64	0.70	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	6.6	0.7	0.1	5.3	205.1	3.9		14.2		14.7	15.0	0.0
Delay (s)	39.4	21.4	25.2	65.5	252.8	44.1		64.7		65.8	66.2	44.1
Level of Service	D	C	C	E	F	D		E		E	E	D
Approach Delay (s)		25.1			220.5			64.7			62.5	
Approach LOS		C			F			E			E	
Intersection Summary												
HCM 2000 Control Delay			138.3	Н	CM 2000	Level of S	Service		F			
HCM 2000 Volume to Capaci	ty ratio		1.01									
Actuated Cycle Length (s)			130.0		um of lost				25.5			
Intersection Capacity Utilizati	on		94.8%			of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	↑	7		र्भ	7	ሻ	†		ሻሻ	†	
Traffic Volume (vph)	50	155	25	48	183	318	43	385	47	851	1380	124
Future Volume (vph)	50	155	25	48	183	318	43	385	47	851	1380	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1826	1568	1752	3443		3400	3461	
FIt Permitted	0.28	1.00	1.00		0.90	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	523	1845	1568		1660	1568	1752	3443		3400	3461	
Peak-hour factor, PHF	0.89	0.90	0.89	0.92	0.90	0.82	0.90	0.92	0.84	0.84	0.92	0.91
Adj. Flow (vph)	56	172	28	52	203	388	48	418	56	1013	1500	136
RTOR Reduction (vph)	0	0	20	0	0	0	0	12	0	0	6	0
Lane Group Flow (vph)	56	172	8	0	255	388	48	462	0	1013	1630	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	40000
Permitted Phases	4		4	8		Free						
Actuated Green, G (s)	24.6	24.6	24.6		18.5	90.0	3.2	19.1		32.9	48.8	
Effective Green, g (s)	24.6	24.6	24.6		18.5	90.0	3.2	19.1		32.9	48.8	NAME OF TAXABLE PARTY.
Actuated g/C Ratio	0.27	0.27	0.27		0.21	1.00	0.04	0.21	HERRI	0.37	0.54	
Clearance Time (s)	3.5	4.6	4.6		4.0		3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5		2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	186	504	428		341	1568	62	730		1242	1876	
v/s Ratio Prot	0.01	0.09					0.03	c0.13		0.30	c0.47	
v/s Ratio Perm	0.07		0.00		c0.15	c0.25						
v/c Ratio	0.30	0.34	0.02		0.75	0.25	0.77	0.63		0.82	0.87	
Uniform Delay, d1	25.3	26.2	23.9		33.6	0.0	43.0	32.3		25.8	17.8	Section 19
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	NG IS TO
Incremental Delay, d2	0.3	0.3	0.0		8.2	0.4	41.1	4.2		4.2	5.8	
Delay (s)	25.6	26.5	23.9		41.8	0.4	84.1	36.4		30.1	23.6	200
Level of Service	С	С	С		D	Α	F	D		С	C	
Approach Delay (s)		26.0			16.8			40.8			26.1	E116 65
Approach LOS		С			В			D			C	
Intersection Summary												
HCM 2000 Control Delay			26.5	Н	CM 2000	Level of S	Service		С			
HCM 2000 Volume to Capa	acity ratio		0.82									
Actuated Cycle Length (s)			90.0	Sı	um of lost	time (s)			16.3			
Intersection Capacity Utiliz	ation		80.8%			of Service			D			
Analysis Period (min)			15			22,1100			To be the second of			
c Critical Lane Group												



Site: El Rancho Dr/Sullivan Ln

2040 Plus Project Conditions - with Mitigation AM Peak Hour Roundabout

Mov	OD	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay	Service	Vehicles veh	Distance	Queued	Stop Rate per veh	Speed mph
South:	El Rancho D	or NB									
8	T1	120	2.0	0.581	17.9	LOSC	2.4	59.9	0.70	0.77	28.5
18	R2	204	2.0	0.581	17.9	LOS C	2.4	59.9	0.70	0.77	28.0
Approa	ich	324	2.0	0.581	17.9	LOS C	2.4	59.9	0.70	0.77	28.2
East: S	ullivan Ln W	/B									
1	L2	108	2.0	0.110	4.7	LOSA	0.4	10.1	0.25	0.14	32.0
16	R2	579	2.0	0.590	11.8	LOS B	4.0	100.8	0.46	0.30	30.0
Approa	ich	687	2.0	0.590	10.7	LOS B	4.0	100.8	0.42	0.27	30.3
North:	El Rancho D	r SB									
7	L2	963	2.0	0.666	13.9	LOS B	5.3	133.6	0.51	0.32	28.7
4	T1	359	2.0	0.666	13.9	LOS B	5.3	133.6	0.51	0.32	29.3
Approa	ich	1321	2.0	0.666	13.9	LOS B	5.3	133.6	0.51	0.32	28.8
All Veh	icles	2332	2.0	0.666	13.5	LOSB	5.3	133.6	0.51	0.37	29.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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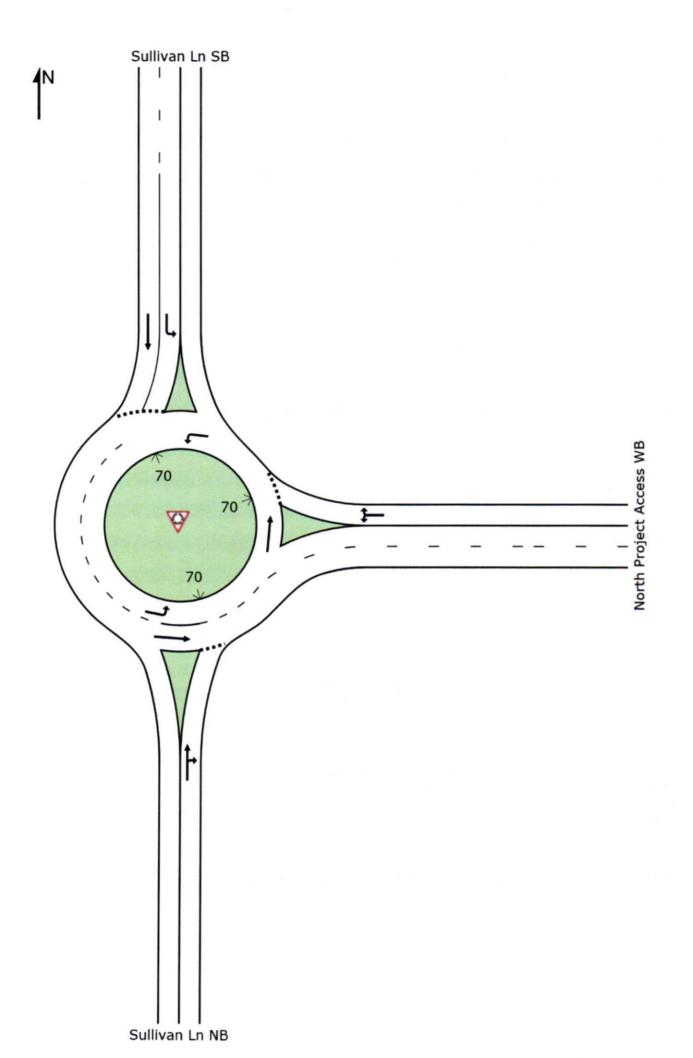
Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\2040PP-AM.sip6 8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

SIDRA INTERSECTION 6

	٠	→	•	•	-	•	1	†	~	-	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^ ^	7	ሻ	^ ^	7	ሻ	4		ሻሻ	↑	7
Traffic Volume (vph)	177	820	34	49	1912	295	58	165	34	351	128	78
Future Volume (vph)	177	820	34	49	1912	295	58	165	34	351	128	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1819		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1819		3433	1863	1583
Peak-hour factor, PHF	0.82	0.98	0.94	0.94	0.98	0.95	0.97	0.86	0.94	0.96	0.91	0.81
Adj. Flow (vph)	216	837	36	52	1951	311	60	192	36	366	141	96
RTOR Reduction (vph)	0	0	19	0	0	106	0	5	0	0	0	72
Lane Group Flow (vph)	216	837	17	52	1951	205	60	223	0	366	141	24
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	22.4	72.3	72.3	7.2	57.4	57.4	8.0	22.8		22.2	37.0	37.0
Effective Green, g (s)	22.4	72.3	72.3	7.2	57.4	57.4	8.0	22.8		22.2	37.0	37.0
Actuated g/C Ratio	0.15	0.48	0.48	0.05	0.38	0.38	0.05	0.15		0.15	0.25	0.25
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	264	2450	763	84	1945	605	94	276		508	459	390
v/s Ratio Prot	c0.12	0.16		0.03	c0.38		0.03	c0.12		c0.11	0.08	
v/s Ratio Perm			0.01			0.13						0.01
v/c Ratio	0.82	0.34	0.02	0.62	1.00	0.34	0.64	0.81		0.72	0.31	0.06
Uniform Delay, d1	61.8	24.1	20.3	70.1	46.3	32.9	69.6	61.5		60.9	46.1	43.2
Progression Factor	0.55	0.10	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.5	0.3	0.1	9.2	21.1	1.5	10.0	14.9		4.2	0.1	0.0
Delay (s)	49.7	2.7	20.4	79.2	67.4	34.4	79.6	76.4		65.2	46.2	43.2
Level of Service	D	A	C	E	E	C	E	E		E	D	D
Approach Delay (s)		12.6			63.3			77.1			57.2	
Approach LOS		В			E			E			E	
Intersection Summary												
HCM 2000 Control Delay			50.5	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capaci	ty ratio		0.89									
Actuated Cycle Length (s)			150.0	S	um of lost	time (s)			25.5			
Intersection Capacity Utilization	on		88.5%			of Service			Е			
Analysis Period (min)			15								Property live	
c Critical Lane Group												

	•	→	•	•	—	•	1	†	~	-		4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7		4	7	ሻ	† ‡		ሻሻ	41	
Traffic Volume (vph)	86	127	59	50	124	615	43	1161	38	372	818	50
Future Volume (vph)	86	127	59	50	124	615	43	1161	38	372	818	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1819	1568	1752	3488		3400	3474	
Flt Permitted	0.38	1.00	1.00		0.87	1.00	0.95	1.00		0.95	1.00	隐即我
Satd. Flow (perm)	694	1845	1568		1607	1568	1752	3488		3400	3474	
Peak-hour factor, PHF	0.92	0.91	0.92	0.89	0.89	0.85	0.90	0.92	0.92	0.86	0.92	0.89
Adj. Flow (vph)	93	140	64	56	139	724	48	1262	41	433	889	56
RTOR Reduction (vph)	0	0	47	0	0	521	0	2	0	0	4	0
Lane Group Flow (vph)	93	140	17	0	195	203	48	1301	0	433	941	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	23.6	23.6	23.6		17.5	17.5	7.1	36.4		16.6	45.9	
Effective Green, g (s)	23.6	23.6	23.6		17.5	17.5	7.1	36.4		16.6	45.9	
Actuated g/C Ratio	0.26	0.26	0.26		0.19	0.19	0.08	0.40		0.18	0.51	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	219	483	411		312	304	138	1410		627	1771	
v/s Ratio Prot	c0.02	0.08		1000			0.03	c0.37		c0.13	0.27	
v/s Ratio Perm	0.10		0.01		0.12	c0.13						
v/c Ratio	0.42	0.29	0.04		0.62	0.67	0.35	0.92		0.69	0.53	
Uniform Delay, d1	27.2	26.5	24.8		33.2	33.6	39.3	25.5		34.3	14.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	E COM	1.00	1.00	Later Co
Incremental Delay, d2	0.5	0.2	0.0		3.4	4.9	0.6	11.5		3.3	1.1	COLUMN TO SE
Delay (s)	27.7	26.8	24.8		36.6	38.5	39.8	36.9		37.6	16.0	14/15/5
Level of Service	С	С	С		D	D	D	D		D	В	
Approach Delay (s)		26.6			38.1			37.0			22.8	35-34 B
Approach LOS		С			D			D			С	
Intersection Summary									The state of			
HCM 2000 Control Delay			31.5	Н	CM 2000	Level of	Service		С			
HCM 2000 Volume to Capa	acity ratio		0.79									
Actuated Cycle Length (s)			90.0	Sı	um of lost	time (s)			16.3			and the last of
Intersection Capacity Utiliz	ation		89.6%			of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												EXELS:

Intersection						
Int Delay, s/veh	325.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		1+		*	^
Traffic Vol, veh/h	105	546	305	70	389	175
Future Vol, veh/h	105	546	305	70	389	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	0.00	None		None	-	
Storage Length	0	-	_	-	200	-
Veh in Median Storage			0		200	0
Grade, %	0		0	-	_	0
Peak Hour Factor	75	84	92	80	87	91
Heavy Vehicles, %	2	2	2	2	2	2
Mymt Flow	140	650	332	88	447	192
WIVITIL FIOW	140	000	332	88	441	192
Major/Minor	Minor1	N	Major1		Major2	
Conflicting Flow All	1462	375	0	0	419	0
Stage 1	375					
Stage 2	1087	-	-			-
Critical Hdwy	6.42	6.22			4.12	
Critical Hdwy Stg 1	5.42	0.22	-		7.12	SUSPERIOR -
Critical Hdwy Stg 2	5.42				CITY OF	
Follow-up Hdwy	3.518		-		2.218	-
Pot Cap-1 Maneuver	142	671		78,410 (0)	1140	
The state of the s	695	0/1			1140	•
Stage 1		-	-		-	-
Stage 2	323	-				
Platoon blocked, %	00	074	-	-	1110	-
Mov Cap-1 Maneuver	~ 86	671			1140	
Mov Cap-2 Maneuver	~ 86	-	-		-	-
Stage 1	695					
Stage 2	196	-	-	-	-	-
Approach	WB		NB	61 N	SB	
HCM Control Delay, s			0		7.1	
HCM LOS	\$ 755 F		U		1.1	
HCM LOS	F	Manager 1				
Minor Lane/Major Mvm	nt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)				304	1140	
HCM Lane V/C Ratio		-	-	2.599		-
HCM Control Delay (s)				\$ 755	10.2	
HCM Lane LOS		-	-	F	В	-
HCM 95th %tile Q(veh))			65.3	1.9	
	,			23.0		
Notes						
~: Volume exceeds cap	pacity	\$: De	lay exc	eeds 30	00s	+: Comp



Site: Sullivan Ln/North Project Access

2040 Plus Project Conditions Afternoon Peak Hour Roundabout

Mov	OD	Demano	Flows	Deg.	Average	Level of	95% Back	of Oueue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Satn v/c	Delay	Service	Vehicles veh	Distance	Queued	Stop Rate per veh	Speed
South:	Sullivan Ln	NB									
8	T1	501	2.0	0.526	10.1	LOS B	2.3	58.8	0.32	0.22	31.9
18	R2	28	2.0	0.526	10.1	LOS B	2.3	58.8	0.32	0.22	31.3
Approa	ich	529	2.0	0.526	10.1	LOS B	2.3	58.8	0.32	0.22	31.9
East: N	lorth Project	Access WB									
1	L2	64	2.0	0.528	13.9	LOS B	2.9	72.4	0.67	0.73	29.7
16	R2	287	2.0	0.528	13.9	LOS B	2.9	72.4	0.67	0.73	29.2
Approa	ch	351	2.0	0.528	13.9	LOS B	2.9	72.4	0.67	0.73	29.3
North:	Sullivan Ln S	SB									
7	L2	136	2.0	0.132	4.7	LOSA	0.5	12.5	0.18	0.08	32.2
4	T1	402	2.0	0.388	7.6	LOSA	2.0	50.3	0.24	0.12	33.1
Approa	ch	539	2.0	0.388	6.8	LOSA	2.0	50.3	0.23	0.11	32.9
All Veh	icles	1418	2.0	0.528	9.8	LOSA	2.9	72.4	0.37	0.30	31.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

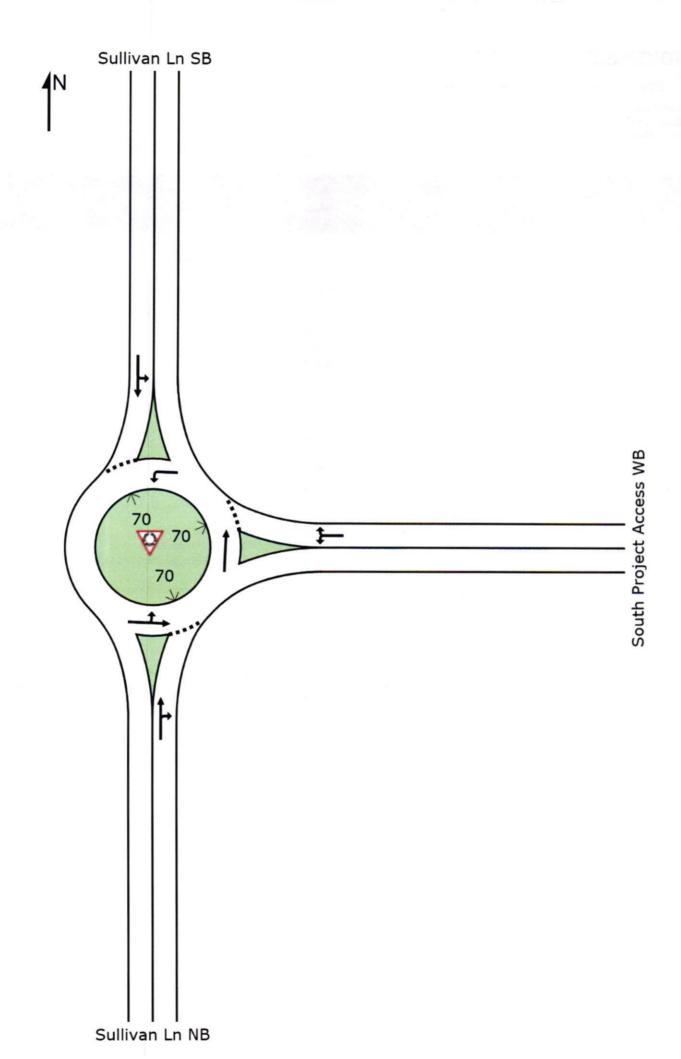
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SIDRA INTERSECTION 6

Intersection						SPORT
Int Delay, s/veh	0.3	The second second		THE PERSON NAMED IN		THE PARTY
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y	LDK	INDL	ND1	100	JOK
Traffic Vol, veh/h	1	15	11	457	404	2
	NAME OF TAXABLE PARTY.					
Future Vol, veh/h	1	15	11	457	404	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		
Storage Length	0	-	-		-	-
Veh in Median Storage	7	•		0	0	
Grade, %	0		-	0	0	-
Peak Hour Factor	84	84	84	81	81	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	18	13	564	499	4
Malas (Mine)	111	COS BA		NOT THE REAL		
	Minor2		Major1		Major2	
Conflicting Flow All	1091	501	503	0		0
Stage 1	501					
Stage 2	590	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12		-	
Critical Hdwy Stg 1	5.42		-		-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318	2.218	-	-	-
Pot Cap-1 Maneuver	238	570	1061			
Stage 1	609	-		-	-	
Stage 2	554					
Platoon blocked, %	004			ST EDWINE	-	
	224	E70	1004	- -		
Mov Cap-1 Maneuver		570	1061		-	
Mov Cap-2 Maneuver	234			-	-	-
Stage 1	609				-	-
Stage 2	544	-			-	-
Approach	EB		NB		SB	
HCM Control Delay, s	12.1		0.2	ALESSAUS	0	
HCM LOS	12.1 B		0.2		U	
I OWI LOO	D					
The state of the State of Stat						Service ST
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1061		523		
HCM Lane V/C Ratio		0.012	-	0.036	-	-
HCM Control Delay (s)		8.4	0	12.1		
HCM Lane LOS		Α	Α	В	_	-
HCM 95th %tile Q(veh)	0		0.1		
7,000				3.1		1



Site: Sullivan Ln/South Project Access

2040 Plus Project Conditions Afternoon Peak Hour Roundabout

Move	ment Perfo	rmance - Ve	hicles								
Mov ID	OD Mov	Demand Total veh/h	I Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	Sullivan Ln I	NB				Marie Control					
8	T1	384	2.0	0.432	8.3	LOSA	2.3	59.5	0.28	0.15	32.7
18	R2	60	2.0	0.432	8.3	LOSA	2.3	59.5	0.28	0.15	32.0
Approa	ich	444	2.0	0.432	8.3	LOSA	2.3	59.5	0.28	0.15	32.6
East: S	outh Project	Access WB									
1	L2	128	2.0	0.386	9.7	LOSA	1.7	42.8	0.55	0.53	31.0
16	R2	161	2.0	0.386	9.7	LOSA	1.7	42.8	0.55	0.53	30.4
Approa	ich	289	2.0	0.386	9.7	LOSA	1.7	42.8	0.55	0.53	30.7
North:	Sullivan Ln S	SB									
7	L2	76	2.0	0.498	9.8	LOSA	2.8	72.4	0.41	0.27	31.6
4	T1	408	2.0	0.498	9.8	LOSA	2.8	72.4	0.41	0.27	31.7
Approa	ich	484	2.0	0.498	9.8	LOSA	2.8	72.4	0.41	0.27	31.7
All Veh	icles	1216	2.0	0.498	9.2	LOSA	2.8	72.4	0.40	0.29	31.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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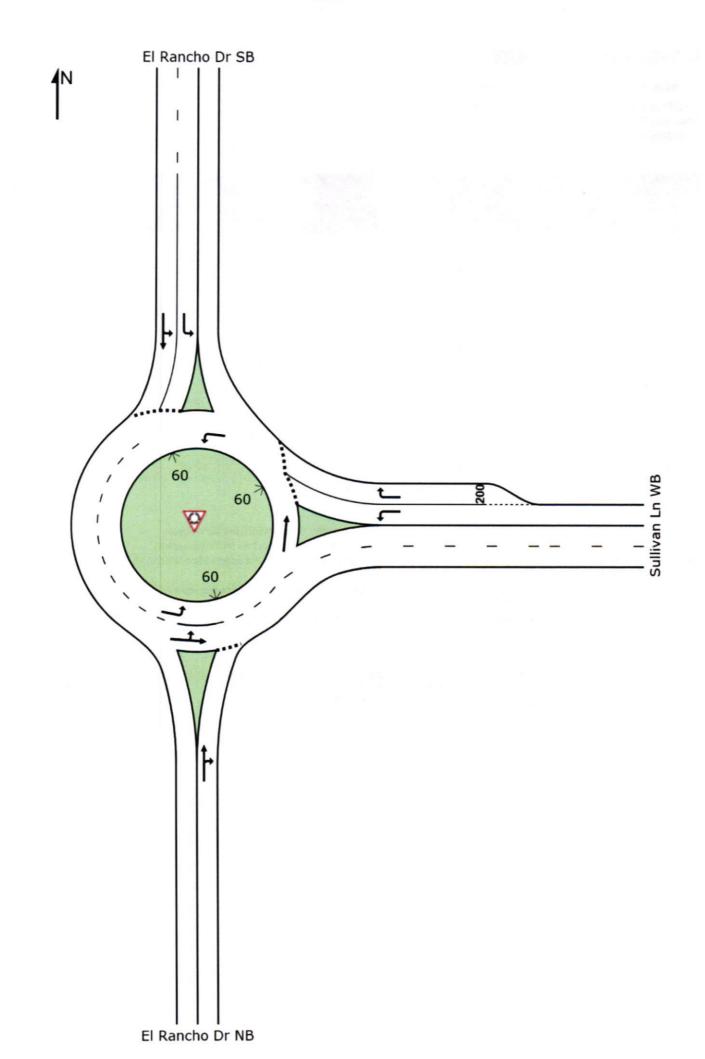
SIDRA INTERSECTION 6

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		ሻ	1			4	
Traffic Vol, veh/h	10	0	80	30	1	15	60	369	10	4	450	4
Future Vol, veh/h	10	0	80	30	1	15	60	369	10	4	450	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	THE R		None			None			None			None
Storage Length				-	-		140	-		-		
Veh in Median Storage	e.# -	0			0			0			0	
Grade, %		0	-		0	-	-	0	-	-	0	-
Peak Hour Factor	83	89	89	89	89	89	88	86	83	89	84	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	90	34	1	17	68	429	12	4	536	4
			The second second second									
Major/Minor	Minor2			Minor1			Major1			Major2	1012	
Conflicting Flow All	1127	1124	538	1163	1120	435	540	0	0	441	0	0
Stage 1	547	547	-	571	571	-	J40 -	-	-	441	-	-
Stage 2	580	577	-	592	549						_	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12			4.12		
Critical Hdwy Stg 1	6.12	5.52	0.22	6.12	5.52	0.22	7.12		1217 23	4.12		
Critical Hdwy Stg 2	6.12	5.52	937	6.12	5.52						200	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218			2.218		
Pot Cap-1 Maneuver	182	205	543	172	206	621	1028			1119	2834	
Stage 1	521	517	- 343	506	505	UZI	1020			-	-	
Stage 2	500	502		493	516			1084				
Platoon blocked, %	300	302		450	310						-	
Mov Cap-1 Maneuver	167	190	543	136	191	621	1028			1119		
Mov Cap-1 Maneuver	167	190	545	136	191	UZI	1020	-		-	-	
Stage 1	487	514	ALE DE	473	472				STEP AND THE STEP			
Stage 2	453	469	-	409	513					-	-	
Stage 2	400	403		+03	313							
Approach	EB	HERATA NA		WB			NB	200		SB		and State
HCM Control Delay, s	16			32			1.2			0.1		
HCM LOS	C	150 100		D		1000	1.4			0.1		
HOW LOS	U			U								
Minor Lane/Major Mvm	vt.	NBL	NBT	NRD	EBLn1V	WRI n1	SBL	SBT	SBR	NO DES	3974.35	
Capacity (veh/h)	IL.	1028	NDI	NON	429	184	1119	-	ODI.			FERR
HCM Lane V/C Ratio		0.066			0.238			-				
		8.8	-		16	32	8.2	0	-			1000
HCM Control Delay (s) HCM Lane LOS		0.0 A			C	D	0.2 A	A				
	1	0.2			0.9	1.1	0	A -				
HCM 95th %tile Q(veh)	0.2	-	•	0.9	1.1	U					

	•	→	•	•	•	•	4	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7	ሻ	4		7	↑	7
Traffic Volume (vph)	216	1415	18	108	1269	57	116	231	118	30	184	150
Future Volume (vph)	216	1415	18	108	1269	57	116	231	118	30	184	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1766		1770	1863	1583
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1766		1770	1863	1583
Peak-hour factor, PHF	0.96	0.98	0.90	0.87	0.97	0.95	0.97	0.95	0.92	0.94	0.90	0.89
Adj. Flow (vph)	225	1444	20	124	1308	60	120	243	128	32	204	169
RTOR Reduction (vph)	0	0	11	0	0	39	0	15	0	0	0	138
Lane Group Flow (vph)	225	1444	9	124	1308	21	120	356	0	32	204	31
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4		K 5 (14)	8						6
Actuated Green, G (s)	24.9	57.0	57.0	13.1	45.2	45.2	12.7	33.2		4.7	24.2	24.2
Effective Green, g (s)	24.9	57.0	57.0	13.1	45.2	45.2	12.7	33.2		4.7	24.2	24.2
Actuated g/C Ratio	0.19	0.44	0.44	0.10	0.35	0.35	0.10	0.26		0.04	0.19	0.19
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	339	2229	694	178	1768	550	172	451		63	346	294
v/s Ratio Prot	c0.13	c0.28		0.07	c0.26		c0.07	c0.20		0.02	0.11	
v/s Ratio Perm			0.01			0.01						0.02
v/c Ratio	0.66	0.65	0.01	0.70	0.74	0.04	0.70	0.79		0.51	0.59	0.11
Uniform Delay, d1	48.7	28.6	20.6	56.5	37.2	28.0	56.8	45.1		61.5	48.4	43.9
Progression Factor	1.00	1.00	1.00	0.44	1.17	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	1.5	0.0	6.3	1.9	0.1	9.5	8.3		2.3	1.7	0.1
Delay (s)	52.4	30.1	20.6	31.4	45.4	28.1	66.3	53.4		63.8	50.0	44.0
Level of Service	D	C	C	C	D	C	E	D		E	D	D
Approach Delay (s)		33.0			43.5			56.6			48.6	
Approach LOS		C			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			41.2	Н	CM 2000	Level of	Service		D			
HCM 2000 Volume to Capac	city ratio		0.76									
Actuated Cycle Length (s)			130.0	S	um of los	time (s)			23.0			
Intersection Capacity Utilizat	tion		77.5%			of Service	1		D			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^ ^^	7		4		ሻ	4	7
Traffic Volume (vph)	90	1411	62	26	1225	207	73	142	51	302	122	136
Future Volume (vph)	90	1411	62	26	1225	207	73	142	51	302	122	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1791		1681	1734	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.98	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1791		1681	1734	1583
Peak-hour factor, PHF	0.87	0.92	0.91	0.92	0.92	0.91	0.91	0.89	0.91	0.90	0.85	0.83
Adj. Flow (vph)	103	1534	68	28	1332	227	80	160	56	336	144	164
RTOR Reduction (vph)	0	0	41	0	0	105	0	7	0	0	0	115
Lane Group Flow (vph)	103	1534	27	28	1332	122	0	289	0	235	245	49
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.7	51.8	51.8	4.6	44.0	44.0		25.2		22.9	22.9	22.9
Effective Green, g (s)	12.7	51.8	51.8	4.6	44.0	44.0		25.2		22.9	22.9	22.9
Actuated g/C Ratio	0.10	0.40	0.40	0.04	0.34	0.34		0.19		0.18	0.18	0.18
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	172	2026	630	62	1721	535		347		296	305	278
v/s Ratio Prot	c0.06	c0.30		0.02	0.26			c0.16		0.14	c0.14	
v/s Ratio Perm			0.02			0.08						0.03
v/c Ratio	0.60	0.76	0.04	0.45	0.77	0.23		0.83		0.79	0.80	0.18
Uniform Delay, d1	56.2	33.7	23.9	61.5	38.5	30.8		50.4		51.3	51.4	45.5
Progression Factor	0.79	0.74	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.0	2.2	0.1	1.9	3.5	1.0	N	14.9		12.8	13.4	0.1
Delay (s)	47.4	27.1	24.0	63.4	42.0	31.8		65.3		64.1	64.8	45.7
Level of Service	D	C	C	E	D	C		E		E	E	D
Approach Delay (s)		28.2			40.9			65.3			59.6	
Approach LOS		C			D			E			E	
Intersection Summary		位置等										
HCM 2000 Control Delay			40.3	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capacit	ty ratio		0.80									
Actuated Cycle Length (s)			130.0	St	um of lost	time (s)			25.5			
Intersection Capacity Utilization	on		78.0%			of Service			D		-	
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	†	7		4	7	ሻ	476		77	47+	
Traffic Volume (vph)	86	127	59	50	124	615	43	1161	38	372	818	50
Future Volume (vph)	86	127	59	50	124	615	43	1161	38	372	818	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1819	1568	1752	3488		3400	3474	
FIt Permitted	0.34	1.00	1.00		0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	631	1845	1568		1599	1568	1752	3488		3400	3474	
Peak-hour factor, PHF	0.92	0.91	0.92	0.89	0.89	0.85	0.90	0.92	0.92	0.86	0.92	0.89
Adj. Flow (vph)	93	140	64	56	139	724	48	1262	41	433	889	56
RTOR Reduction (vph)	0	0	48	0	0	0	0	2	0	0	4	0
Lane Group Flow (vph)	93	140	16	0	195	724	48	1301	0	433	941	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8	-	Free		Market of Table				
Actuated Green, G (s)	21.8	21.8	21.8		15.6	90.0	8.5	37.2		17.6	46.3	
Effective Green, g (s)	21.8	21.8	21.8		15.6	90.0	8.5	37.2		17.6	46.3	
Actuated g/C Ratio	0.24	0.24	0.24		0.17	1.00	0.09	0.41		0.20	0.51	
Clearance Time (s)	3.5	4.6	4.6		4.0		3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5		2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	193	446	379		277	1568	165	1441		664	1787	
v/s Ratio Prot	0.02	0.08				1000	0.03	c0.37		c0.13	0.27	
v/s Ratio Perm	0.10	0.00	0.01		c0.12	c0.46	0.00	00.01		00.10	0.21	
v/c Ratio	0.48	0.31	0.04		0.70	0.46	0.29	0.90		0.65	0.53	
Uniform Delay, d1	28.7	28.0	26.1		35.0	0.0	37.9	24.7		33.4	14.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	e de la compa	1.00	1.00	
Incremental Delay, d2	0.7	0.3	0.0		7.3	1.0	0.4	9.5		2.3	1.1	
Delay (s)	29.4	28.3	26.1		42.3	1.0	38.3	34.2		35.7	15.7	An Asia
Level of Service	С	С	С		D	Α	D	С		D	В	
Approach Delay (s)		28.2			9.8			34.4			22.0	
Approach LOS		С			Α			С			C	
Intersection Summary												
HCM 2000 Control Delay			23.8	Н	CM 2000	Level of S	Service		С			
HCM 2000 Volume to Capa	acity ratio		0.80									YOURS
Actuated Cycle Length (s)			90.0	Sı	um of lost	time (s)			16.3			
Intersection Capacity Utiliz	ation		74.8%			of Service			D			
Analysis Period (min)			15	and the state of the state of					-			ALCOHOLD STATE
c Critical Lane Group												



Site: El Rancho Dr/Sullivan Ln

2040 Plus Project Conditions - with Mitigation Afternoon Peak Hour Roundabout

Mover	nent Perfo	rmance - Ve	hicles								
Mov ID	OD Mov	Demand Total veh/h	I Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	El Rancho D	Or NB									
8	T1	332	2.0	0.520	11.8	LOS B	2.2	56.6	0.52	0.55	30.9
18	R2	87	2.0	0.520	11.8	LOS B	2.2	56.6	0.52	0.55	30.3
Approa	ch	419	2.0	0.520	11.8	LOS B	2.2	56.6	0.52	0.55	30.8
East: S	ullivan Ln W	/B									
1	L2	140	2.0	0.177	6.4	LOSA	0.7	16.6	0.44	0.37	31.2
16	R2	650	2.0	0.823	26.0	LOS D	9.6	243.6	0.90	1.05	25.1
Approa	ch	790	2.0	0.823	22.6	LOS C	9.6	243.6	0.82	0.93	26.1
North: I	El Rancho D	r SB									
7	L2	447	2.0	0.333	7.3	LOSA	1.5	38.6	0.34	0.22	31.3
4	T1	192	2.0	0.333	7.3	LOSA	1.5	38.6	0.34	0.22	32.1
Approa	ch	639	2.0	0.333	7.3	LOSA	1.5	38.6	0.34	0.22	31.5
All Veh	icles	1848	2.0	0.823	14.8	LOSB	9.6	243.6	0.59	0.60	28.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, January 04, 2019 4:01:09 PM SIDRA INTERSECTION 6.0.24.4877

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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\OCT 2018\2040PP-Afternoon.sip6

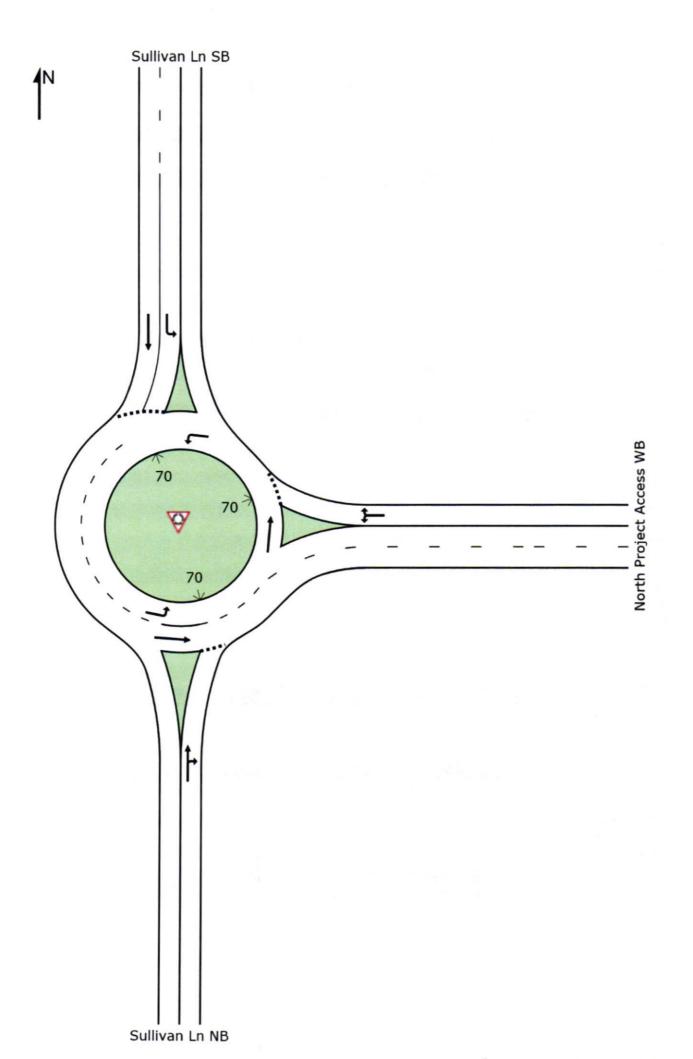
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SIDRA INTERSECTION 6

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^ ^	7	ሻ	4		ሻሻ	↑	7
Traffic Volume (vph)	90	1411	62	26	1225	207	73	142	51	302	122	136
Future Volume (vph)	90	1411	62	26	1225	207	73	142	51	302	122	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1790		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1790		3433	1863	1583
Peak-hour factor, PHF	0.87	0.92	0.91	0.92	0.92	0.91	0.91	0.89	0.91	0.90	0.85	0.83
Adj. Flow (vph)	103	1534	68	28	1332	227	80	160	56	336	144	164
RTOR Reduction (vph)	0	0	35	0	0	118	0	12	0	0	0	140
Lane Group Flow (vph)	103	1534	33	28	1332	109	80	204	0	336	144	24
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.5	60.5	60.5	4.6	52.9	52.9	16.8	20.1		15.3	18.6	18.6
Effective Green, g (s)	12.5	60.5	60.5	4.6	52.9	52.9	16.8	20.1		15.3	18.6	18.6
Actuated g/C Ratio	0.10	0.48	0.48	0.04	0.42	0.42	0.13	0.16		0.12	0.15	0.15
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	175	2441	760	64	2134	664	236	285		416	275	233
v/s Ratio Prot	0.06	c0.30		0.02	c0.26		0.05	c0.11		c0.10	0.08	
v/s Ratio Perm			0.02			0.07						0.02
v/c Ratio	0.59	0.63	0.04	0.44	0.62	0.16	0.34	0.72		0.81	0.52	0.10
Uniform Delay, d1	54.3	24.4	17.4	59.4	28.7	22.8	49.6	50.2		53.9	49.6	46.5
Progression Factor	0.54	0.19	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	1.0	0.1	1.7	1.4	0.5	0.3	7.0	X Y	10.4	0.8	0.1
Delay (s)	31.7	5.5	17.5	61.2	30.1	23.3	49.9	57.2		64.3	50.4	46.6
Level of Service	C	A	В	E	C	C	D	E		E	D	D
Approach Delay (s)		7.6			29.7			55.2			56.7	
Approach LOS		A			C			Е			E	9 9
Intersection Summary				5900								
HCM 2000 Control Delay			26.7	Н	CM 2000	Level of S	Service		C			
HCM 2000 Volume to Capacity	y ratio		0.69									
Actuated Cycle Length (s)			126.0		um of lost				25.5			
Intersection Capacity Utilizatio	n		71.0%	IC	U Level o	of Service			С			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	†	7		ર્ન	7	۳	† \$		77	44	
Traffic Volume (vph)	145	187	64	73	130	634	41	1440	36	382	734	68
Future Volume (vph)	145	187	64	73	130	634	41	1440	36	382	734	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1812	1568	1752	3492		3400	3460	
FIt Permitted	0.42	1.00	1.00		0.81	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	774	1845	1568		1500	1568	1752	3492		3400	3460	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	203	70	79	141	689	45	1565	39	415	798	74
RTOR Reduction (vph)	0	0	47	0	0	192	0	1	0	0	6	0
Lane Group Flow (vph)	158	203	23	0	220	497	45	1603	0	415	866	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8	-	8	e constant					THE SHADE OF
Actuated Green, G (s)	46.6	46.6	46.6		39.0	39.0	19.4	62.5		17.5	60.6	
Effective Green, g (s)	46.6	46.6	46.6		39.0	39.0	19.4	62.5		17.5	60.6	
Actuated g/C Ratio	0.33	0.33	0.33		0.28	0.28	0.14	0.45		0.12	0.43	
Clearance Time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.5	2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	290	614	521		417	436	242	1558		425	1497	
v/s Ratio Prot	c0.02	0.11				100	0.03	c0.46		c0.12	0.25	
v/s Ratio Perm	0.16	0.11	0.01		0.15	c0.32	0.00	00.10		00.12	0.20	E STREET, STRE
v/c Ratio	0.54	0.33	0.04		0.53	1.14	0.19	1.03		0.98	0.58	
Uniform Delay, d1	40.6	35.0	31.6		42.7	50.5	53.3	38.8		61.0	30.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.2	0.0		0.9	87.3	0.1	30.5		37.1	1.6	Model Andre
Delay (s)	41.8	35.2	31.7		43.6	137.8	53.5	69.3		98.2	31.7	
Level of Service	D	D	C		D	F	D	E		F	C	
Approach Delay (s)		37.0			115.0			68.8			53.1	
Approach LOS		D			F			E			D	
Intersection Summary												
HCM 2000 Control Delay			70.7	Н	CM 2000	Level of S	Service		Е		The second data list	
HCM 2000 Volume to Capa	acity ratio		1.04					H-141X				
Actuated Cycle Length (s)			140.0	Sı	um of lost	time (s)			16.3			
Intersection Capacity Utiliz	ation	TA SE	101.6%			of Service			G			
Analysis Period (min)			15		J _5101 (. 0011100			0			
c Critical Lane Group											v 645 in	

Intersection						
Int Delay, s/veh	132.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		1>		*	†
Traffic Vol, veh/h	41	514	414	49	460	209
Future Vol, veh/h	41	514	414	49	460	209
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		IN STREET, SQUARE,		None		None
Storage Length	0	-	-	-	200	-
Veh in Median Storage			0			0
Grade, %	0	_	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mymt Flow	45	559	450	53	500	227
WWITH TIOW	40	339	400	33	500	221
Major/Minor	Minor1	ı	Major1		Major2	
Conflicting Flow All	1704	477	0	0	503	0
Stage 1	477					-
Stage 2	1227	-	-	-		-
Critical Hdwy	6.42	6.22			4.12	
Critical Hdwy Stg 1	5.42		-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy	3.518		-	-	2.218	
Pot Cap-1 Maneuver	101	588		020000	1061	
Stage 1	624	000	-	NAME OF TAXABLE PARTY.	1001	
Stage 2	277			-	-	-
Platoon blocked, %	211	19,000				
	F0	F00	·	SAME SE	4004	
Mov Cap-1 Maneuver	53	588			1061	
Mov Cap-2 Maneuver	53	-		-	-	-
Stage 1	624			•		
Stage 2	146	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s			0		7.8	
HCM LOS	\$ 394 F		U		1.0	
HOW LOS						
Minor Lane/Major Mvm	it	NBT	NBRV	/BLn1	SBL	SBT
Capacity (veh/h)				337	1061	-
HCM Lane V/C Ratio		-	-		0.471	-
HCM Control Delay (s)		-		\$ 394	11.4	
HCM Lane LOS		-	-	F	В	
HCM 95th %tile Q(veh)				39.1	2.6	
		0.356				
Notes						
~: Volume exceeds cap	pacity	\$: De	lay exc	eeds 30	00s	+: Comp





Site: Sullivan Ln/North Project Access

2040 Plus Project Conditions PM Peak Hour Roundabout

Mov	OD	Demand	Flower	Dog	Average	Level of	95% Back	of Ourous	Dron	C#active.	Augus
ID	Mov	Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Service	Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	Sullivan Ln	NB									
8	T1	527	2.0	0.515	9.5	LOSA	2.3	58.5	0.22	0.12	32.2
18	R2	15	2.0	0.515	9.5	LOSA	2.3	58.5	0.22	0.12	31.5
Approa	ich	542	2.0	0.515	9.5	LOSA	2.3	58.5	0.22	0.12	32.1
East: N	lorth Project	Access WB									
1	L2	16	2.0	0.143	7.2	LOSA	0.5	12.5	0.52	0.50	32.7
16	R2	76	2.0	0.143	7.2	LOSA	0.5	12.5	0.52	0.50	32.1
Approa	ch	92	2.0	0.143	7.2	LOSA	0.5	12.5	0.52	0.50	32.2
North:	Sullivan Ln S	SB									
7	L2	70	2.0	0.064	3.8	LOSA	0.2	5.7	0.07	0.02	32.6
4	T1	484	2.0	0.444	8.1	LOSA	2.6	65.1	0.12	0.04	32.8
Approa	ch	553	2.0	0.444	7.6	LOSA	2.6	65.1	0.12	0.03	32.8
All Veh	icles	1188	2.0	0.515	8.5	LOSA	2.6	65.1	0.20	0.11	32.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

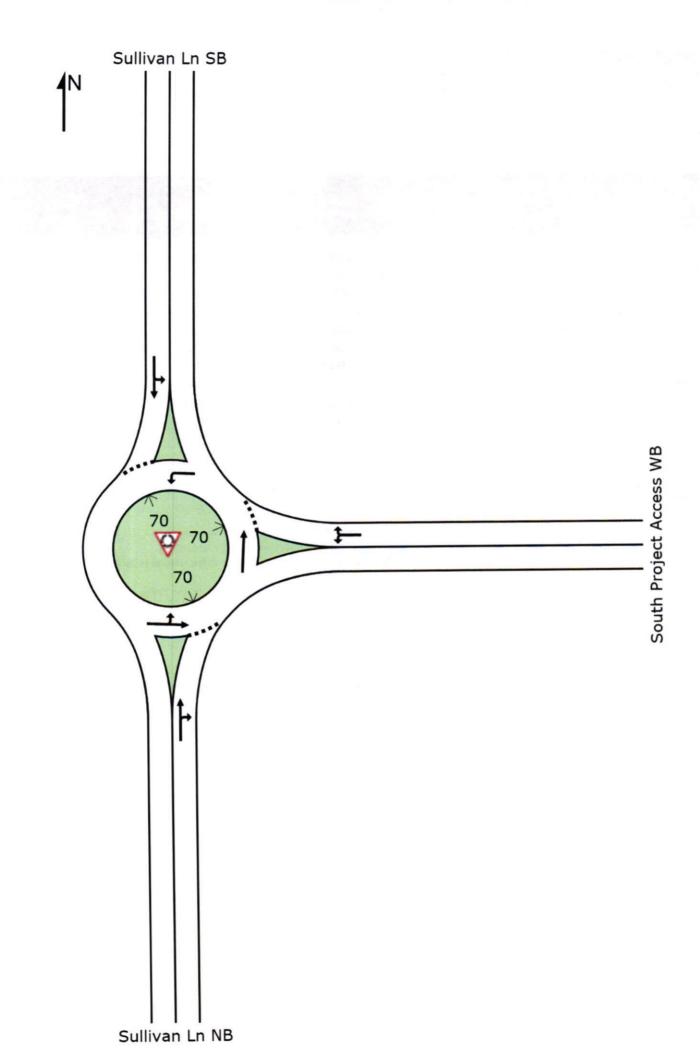
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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\2040PP-PM.sip6 8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

SIDRA INTERSECTION 6

Intersection						
Int Delay, s/veh	0.4			55475	\$ 5.00E	
**************************************	1200 120	EDD	N.	LIDE	007	000
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥			4	4	
Traffic Vol, veh/h	5	10	15	494	455	5
Future Vol, veh/h	5	10	15	494	455	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	-	-	-	-	
Veh in Median Storage	e, # 0			0	0	
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	11	17	561	517	6
				001	011	
STATE OF THE OWNER, THE PARTY NAMED IN	Minor2		Major1		Major2	
Conflicting Flow All	1115	520	523	0	-	0
Stage 1	520					
Stage 2	595	-		-	-	-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy		3.318		-	-	
Pot Cap-1 Maneuver	230	556	1043			
Stage 1	597	-	1010		ALLEN S	udentida •
Stage 2	551	estima.	TELEVISION OF	LETGER!	-	
Platoon blocked, %	331					
	224	EEC	1012		-	-
Mov Cap-1 Maneuver	224	556	1043			-
Mov Cap-2 Maneuver	224	-	Maria Carlo	-		
Stage 1	597	•	•			
Stage 2	538	-		-	-	
Approach	EB		NB	STANCE OF	SB	
HCM Control Delay, s	15.1		0.3		0	
HCM LOS	C		0.3		U	
TIGIVI LOS	U					
Minor Lane/Major Mvm	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1043		372		
HCM Lane V/C Ratio		0.016		0.046	-	
HCM Control Delay (s)		8.5	0	15.1	-	
HCM Lane LOS		Α	A	C	-	-
HCM 95th %tile Q(veh))	0.1	^	0.1		
TOW JOHN JOHN GIVEN		0.1	1012/20	0.1		•



Site: Sullivan Ln/South Project Access

2040 Plus Project Conditions PM Peak Hour Roundabout

		rmance - Ve									
Mov ID	OD Mov	Demand Total veh/h	l Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South:	Sullivan Ln	NB								per veri	mpi
8	T1	511	2.0	0.510	9.4	LOSA	3.2	82.0	0.23	0.09	32.2
18	R2	32	2.0	0.510	9.4	LOSA	3.2	82.0	0.23	0.09	31.5
Approa	ach	542	2.0	0.510	9.4	LOSA	3.2	82.0	0.23	0.09	32.2
East: S	South Project	Access WB									
1	L2	34	2.0	0.116	6.8	LOSA	0.4	10.0	0.50	0.47	32.3
16	R2	42	2.0	0.116	6.8	LOSA	0.4	10.0	0.50	0.47	31.7
Approa	nch	76	2.0	0.116	6.8	LOSA	0.4	10.0	0.50	0.47	32.0
North:	Sullivan Ln S	SB									
7	L2	39	2.0	0.472	8.7	LOSA	2.8	71.5	0.19	0.08	32.3
4	T1	466	2.0	0.472	8.7	LOSA	2.8	71.5	0.19	0.08	32.4
Approa	ich	505	2.0	0.472	8.7	LOSA	2.8	71.5	0.19	0.08	32.4
All Veh	icles	1124	2.0	0.510	8.9	LOSA	3.2	82.0	0.23	0.11	32.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies. Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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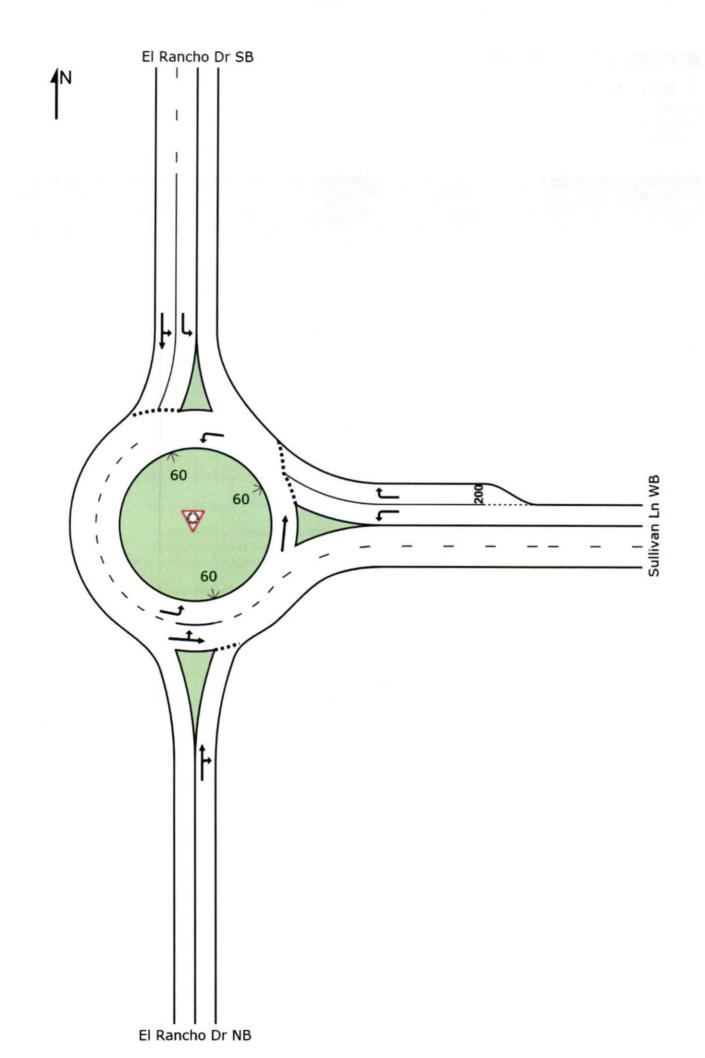
SIDRA INTERSECTION 6

Novement Care Car
Caragram Configurations Caragram Car
Traffic Vol, veh/h 21 0 150 35 1 4 55 474 30 10 440 10 Future Vol, veh/h 21 0 150 35 1 4 55 474 30 10 440 10 Conflicting Peds, #/hr 0 0 0 0 0 0 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 Free Fre
Traffic Vol, veh/h 21 0 150 35 1 4 55 474 30 10 440 10 Future Vol, veh/h 21 0 150 35 1 4 55 474 30 10 440 10 Conflicting Peds, #/hr 0
Future Vol, veh/h 21 0 150 35 1 4 55 474 30 10 440 10 Conflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Conflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Sign Control Stop Stop Stop Stop Stop Stop Stop Stop Free Polon Corriging Flow All 1122 158 37 1 4 58 499 32 11 463 11 M
RT Channelized - None - None - None - None - None - None Storage Length
Storage Length - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - 1 0 1 1 1 1 1 0 0 1 1 1 1 0
Grade, % - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - 95
Peak Hour Factor 95
Heavy Vehicles, % 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Moment Flow 22 0 158 37 1 4 58 499 32 11 463 11 Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 1122 1135 468 1199 1126 515 474 0 0 531 0 0 Stage 1 489 489 - 631 631 - <td< td=""></td<>
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 1122 1135 468 1199 1126 515 474 0 0 531 0 0 Stage 1 489 489 - 631 631 -<
Conflicting Flow All 1122 1135 468 1199 1126 515 474 0 0 531 0 0 Stage 1 489 489 - 631 631 -
Conflicting Flow All 1122 1135 468 1199 1126 515 474 0 0 531 0 0 Stage 1 489 489 - 631 631 -
Stage 1 489 489 - 631 631
Stage 2 633 646 - 568 495 -
Critical Hdwy 7.12 6.52 6.22 7.12 6.52 6.22 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 Manager 183 202 505 162 205 560 1000 1026
Stage 1 561 549 - 469 474
Stage 2 468 467 - 508 546
Platoon blocked, %
Mov Cap-1 Maneuver 172 189 595 113 191 560 1088 1036
Mov Cap-2 Maneuver 172 189 - 113 191
Stage 1 531 541 - 444 449
Stage 2 439 442 - 368 538
Approach EB WB NB SB
HCM Control Delay, s 17.9 48.3 0.8 0.2
HCM LOS C E
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR
Capacity (veh/h) 1088 457 124 1036
HCM Lane V/C Ratio 0.053 0.394 0.34 0.01
HCM Control Delay (s) 8.5 17.9 48.3 8.5 0 -
HCM Lane LOS A C E A A -
HCM 95th %tile Q(veh) 0.2 1.9 1.4 0

	۶	→	•	•	←	•	•	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7	ሻ	4		ሻ	†	7
Traffic Volume (vph)	215	1958	66	75	1559	70	115	326	104	40	123	142
Future Volume (vph)	215	1958	66	75	1559	70	115	326	104	40	123	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1795		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1795		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	222	2019	68	77	1607	72	119	336	107	41	127	146
RTOR Reduction (vph)	0	0	37	0	0	45	0	9	0	0	0	113
Lane Group Flow (vph)	222	2019	31	77	1607	27	119	434	0	41	127	33
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	A SECULAR OF THE PARTY OF THE PARTY.
Permitted Phases			4			8						6
Actuated Green, G (s)	18.5	60.1	60.1	7.8	49.4	49.4	9.7	33.9		6.2	29.4	29.4
Effective Green, g (s)	18.5	60.1	60.1	7.8	49.4	49.4	9.7	33.9		6.2	29.4	29.4
Actuated g/C Ratio	0.14	0.46	0.46	0.06	0.38	0.38	0.07	0.26		0.05	0.23	0.23
Clearance Time (s)	5.4	6.3	6.3	5.7	6.6	6.6	4.5	4.7		5.3	6.5	6.5
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	251	2350	731	106	1932	601	132	468		84	421	358
v/s Ratio Prot	c0.13	c0.40		0.04	0.32		c0.07	c0.24		0.02	0.07	
v/s Ratio Perm			0.02			0.02						0.02
v/c Ratio	0.88	0.86	0.04	0.73	0.83	0.05	0.90	0.93		0.49	0.30	0.09
Uniform Delay, d1	54.7	31.2	19.2	60.1	36.5	25.4	59.7	46.9		60.4	41.8	39.8
Progression Factor	1.00	1.00	1.00	0.43	1.28	26.13	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	28.0	4.4	0.1	10.0	2.2	0.1	48.7	24.2		1.6	0.1	0.0
Delay (s)	82.7	35.5	19.3	35.8	49.0	664.5	108.4	71.1		62.0	41.9	39.8
Level of Service	F	D	В	D	D	F	F	E		E	D	D
Approach Delay (s)		39.6			73.7			79.0			43.6	
Approach LOS		D			E			E			D	1000
Intersection Summary												
HCM 2000 Control Delay			56.4	Н	CM 2000	Level of	Service		Е			10000
HCM 2000 Volume to Capa	city ratio		0.94									
Actuated Cycle Length (s)			130.0	St	um of lost	t time (s)			23.0			
Intersection Capacity Utiliza	tion		89.6%			of Service			Е			and the latest design.
Analysis Period (min)			15									
c Critical Lane Group												

	٠	→	•	1	←	•	4	†	-	-	ļ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	ተተተ	7		4		ሻ	4	7
Traffic Volume (vph)	92	1955	55	77	1419	278	88	189	77	276	152	197
Future Volume (vph)	92	1955	55	77	1419	278	88	189	77	276	152	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.99	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	,	1786		1681	1743	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.99	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1786		1681	1743	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	2058	58	81	1494	293	93	199	81	291	160	207
RTOR Reduction (vph)	0	0	39	0	0	123	0	8	0	0	0	135
Lane Group Flow (vph)	97	2058	19	81	1494	170	0	365	0	221	230	72
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases		170	4			8					Resident	6
Actuated Green, G (s)	11.3	43.5	43.5	9.5	42.0	42.0		29.5		22.0	22.0	22.0
Effective Green, g (s)	11.3	43.5	43.5	9.5	42.0	42.0	Telesia.	29.5		22.0	22.0	22.0
Actuated g/C Ratio	0.09	0.33	0.33	0.07	0.32	0.32		0.23		0.17	0.17	0.17
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3		6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	153	1701	529	129	1642	511		405		284	294	267
v/s Ratio Prot	c0.05	c0.40	020	0.05	0.29			c0.20		0.13	c0.13	201
v/s Ratio Perm	SHEW.		0.01			0.11	9712493	00.20		0.10	4	0.05
v/c Ratio	0.63	1.21	0.04	0.63	0.91	0.33		0.90		0.78	0.78	0.27
Uniform Delay, d1	57.4	43.2	29.1	58.5	42.2	33.4		48.8		51.7	51.7	47.0
Progression Factor	1.09	0.64	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	97.8	0.1	6.7	9.0	1.7		22.3		11.6	11.8	0.2
Delay (s)	66.1	125.6	29.2	65.2	51.2	35.1		71.1		63.2	63.5	47.2
Level of Service	E	F	C	E	D	D		E		E	Е	D
Approach Delay (s)		120.5			49.3			71.1			58.3	Section 1
Approach LOS		F			D			E			E	
Intersection Summary									0.50			
HCM 2000 Control Delay			82.9	H	CM 2000	Level of S	Service		F			
HCM 2000 Volume to Capa	city ratio		0.99									
Actuated Cycle Length (s)			130.0	SI	um of lost	t time (s)			25.5			
Intersection Capacity Utiliza	ition		94.4%	IC	U Level	of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

	٠	→	•	•	←	•	4	†	-	-	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	†	7		र्स	7	ሻ	†		ሻሻ	†	
Traffic Volume (vph)	145	187	64	73	130	634	41	1440	36	382	734	68
Future Volume (vph)	145	187	64	73	130	634	41	1440	36	382	734	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6	4.6		4.0	4.0	3.5	5.3		3.5	5.3	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Fit Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568		1812	1568	1752	3492		3400	3460	
Flt Permitted	0.30	1.00	1.00		0.80	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	560	1845	1568		1483	1568	1752	3492		3400	3460	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	203	70	79	141	689	45	1565	39	415	798	74
RTOR Reduction (vph)	0	0	52	0	0	0	0	2	0	0	7	0
Lane Group Flow (vph)	158	203	18	0	220	689	45	1602	0	415	865	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Prot	NA		Prot	NA	
Protected Phases	7	4			8	1100	5	2		1	6	No.
Permitted Phases	4	•	4	8		Free						
Actuated Green, G (s)	27.9	27.9	27.9		20.5	110.0	15.0	51.2		17.5	53.7	
Effective Green, g (s)	27.9	27.9	27.9		20.5	110.0	15.0	51.2		17.5	53.7	
Actuated g/C Ratio	0.25	0.25	0.25		0.19	1.00	0.14	0.47		0.16	0.49	
Clearance Time (s)	3.5	4.6	4.6		4.0	1.00	3.5	5.3		3.5	5.3	
Vehicle Extension (s)	2.0	2.5	2.5		2.5		2.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	190	467	397		276	1568	238	1625		540	1689	
v/s Ratio Prot	c0.03	0.11	001		210	1000	0.03	c0.46		c0.12	0.25	
v/s Ratio Perm	c0.18	0.11	0.01		0.15	0.44	0.00	60.40		60.12	0.20	
v/c Ratio	0.83	0.43	0.04		0.80	0.44	0.19	0.99		0.77	0.51	
Uniform Delay, d1	39.4	34.4	31.0		42.8	0.0	42.1	29.0		44.3	19.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	910 94 10 9	1.00	1.00	
Incremental Delay, d2	24.5	0.5	0.0	daniel en et et e	14.3	0.9	0.1	19.3		6.5	1.1	
Delay (s)	64.0	34.9	31.0		57.0	0.9	42.2	48.3		50.8	20.3	
Level of Service	E	C	C		E	Α	D	D		D	20.5 C	
Approach Delay (s)		44.9			14.5			48.1			30.2	
Approach LOS		D			В			D			C	
Intersection Summary												
HCM 2000 Control Delay			35.2	Н	CM 2000	Level of S	Service		D	THE RESERVE OF THE PARTY OF THE		The Park of
HCM 2000 Volume to Capacity ratio			0.92		2000		311.00				1000	
Actuated Cycle Length (s)			110.0	Si	um of lost	time (s)			16.3			
Intersection Capacity Utilization			87.5%			of Service			10.5			
Analysis Period (min)		15	10	O LOVOI (J. OUI VICE							
c Critical Lane Group												





Site: El Rancho Dr/Sullivan Ln

2040 Plus Project Conditions - with Mitigation PM Peak Hour Roundabout

Mov	OD	Demand	Demand Flows		Average	Level of	95% Back	of Queue	Prop.	Effective	Average
ID	Mov	Total veh/h	HV %	Deg. Satn v/c	Delay sec	Service	Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
South:	El Rancho I	Or NB									
8	T1	450	2.0	0.649	16.1	LOS C	3.5	88.1	0.63	0.69	29.2
18	R2	53	2.0	0.649	16.1	LOS C	3.5	88.1	0.63	0.69	28.7
Approa	ich	503	2.0	0.649	16.1	LOSC	3.5	88.1	0.63	0.69	29.1
East: S	Sullivan Ln W	/B									
1	L2	45	2.0	0.064	5.8	LOSA	0.2	5.4	0.46	0.39	31.5
16	R2	559	2.0	0.798	26.2	LOS D	7.7	195.7	0.88	1.05	25.1
Approa	ich	603	2.0	0.798	24.7	LOS C	7.7	195.7	0.85	1.00	25.5
North:	El Rancho D	or SB									
7	L2	500	2.0	0.343	6.9	LOSA	1.7	42.4	0.19	0.08	31.4
4	T1	227	2.0	0.343	6.9	LOSA	1.7	42.4	0.19	0.08	32.3
Approa	ich	727	2.0	0.343	6.9	LOSA	1.7	42.4	0.19	0.08	31.7
All Veh	icles	1834	2.0	0.798	15.3	LOSC	7.7	195.7	0.53	0.55	28.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, January 04, 2019 4:05:13 PM SIDRA INTERSECTION 6.0.24.4877

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Project: J:\17-498 - WCSD Wildcreek Wood Rodgers\Analysis\SIDRA\OCT 2018\2040PP-PM.sip6 8001485, 6017358, TRAFFIC WORKS, PLUS / 1PC

SIDRA INTERSECTION 6

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	^	7	ሻ	^	7	ሻ	7		ሻሻ	†	7
Traffic Volume (vph)	92	1955	55	77	1419	278	88	189	77	276	152	197
Future Volume (vph)	92	1955	55	77	1419	278	88	189	77	276	152	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1782		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1770	1782		3433	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	2058	58	81	1494	293	93	199	81	291	160	207
RTOR Reduction (vph)	0	0	33	0	0	94	0	11	0	0	0	176
Lane Group Flow (vph)	97	2058	25	81	1494	199	93	269	0	291	160	31
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.4	64.9	64.9	15.5	68.3	68.3	26.8	27.0		17.1	17.3	17.3
Effective Green, g (s)	12.4	64.9	64.9	15.5	68.3	68.3	26.8	27.0		17.1	17.3	17.3
Actuated g/C Ratio	0.08	0.43	0.43	0.10	0.46	0.46	0.18	0.18		0.11	0.12	0.12
Clearance Time (s)	6.7	6.3	6.3	6.0	5.3	5.3	6.6	6.6		6.6	6.6	6.6
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	146	2200	684	182	2315	720	316	320		391	214	182
v/s Ratio Prot	0.05	c0.40		0.05	c0.29		0.05	c0.15		c0.08	0.09	
v/s Ratio Perm			0.02			0.13						0.02
v/c Ratio	0.66	0.94	0.04	0.45	0.65	0.28	0.29	0.84		0.74	0.75	0.17
Uniform Delay, d1	66.8	40.6	24.5	63.2	31.5	25.4	53.4	59.4		64.3	64.2	59.9
Progression Factor	0.62	0.39	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	5.9	0.1	0.6	1.4	1.0	0.2	17.2		6.6	11.7	0.2
Delay (s)	46.3	21.5	24.6	63.8	32.9	26.4	53.6	76.6		70.9	76.0	60.0
Level of Service	D	C	C	E	C	C	D	E		E	E	E
Approach Delay (s)		22.7			33.2			70.9			68.7	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			36.0	Н	CM 2000	Level of S	Service		D			
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			150.0		um of lost				25.5			
Intersection Capacity Utilization			85.8%	IC	U Level of	of Service			Ε			
Analysis Period (min)			15									