

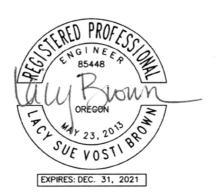
# PREPARED FOR YOUTH WITH A MISSION SALEM

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# PREPARED BY DKS ASSOCIATES



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# INTRODUCTION

This study evaluates the transportation impacts associated with the proposed expansion of the Youth with A Mission (YWAM) Salem Campus located on Battle Creek Road SE in Marion County, Oregon. The campus expansion will be implemented in multiple phases. However, this study considers full buildout only, which has been assumed to occur by 2025. Depending on circumstances, full buildout could take longer.

As proposed, the impact to the surrounding traffic system can be mitigated through the mitigation measures outlined herein. As mitigated, the expansion of the campus will not have a significant impact on the surrounding transportation system.

The purpose of this transportation impact analysis is to identify potential mitigation measures needed to offset impacts that the proposed expansion may have on the nearby transportation network. The impact analysis is focused on three study intersections, which were selected for evaluation in coordination with Marion County. The study intersections are listed below:

- YWAM Existing Site Access Road/Battle Creek Road SE
- Delaney Road SE/Battle Creek Road SE
- Delaney Road SE/Parrish Gap Road SE

Table 1 on the following page lists important characteristics of the study area and proposed project.

TABLE 1: KEY STUDY AREA AND PROPOSED DEVELOPMENT CHARACTERISTICS

CHARACTERISTICS	INFORMATION			
STUDY AREA				
NUMBER OF STUDY INTERSECTIONS	Three			
ANALYSIS PERIOD	Weekday AM and PM Peak Hours (Peak hours are one hour between 7-9 AM and 4-6 PM, respectively)			
PROJECT SITE				
EXISTING LAND USE	YWAM Salem Campus			
PROPOSED DEVELOPMENT	Expansion of existing campus facilities including additional housing/dorms, an RV site, expanded dining and kitchen spaces, a new assembly hall, and sports field.			
PROPOSED PROJECT ACCESSES	One existing full-access driveway on Battle Creek Road SE			

<sup>&</sup>lt;sup>1</sup> Email correspondence with Janelle Shanahan and Lani Radtke on June 18, 2020.

# **EXISTING CONDITIONS**

This chapter provides documentation of existing study area conditions, including the study area roadway network, pedestrian and bicycle facilities, and existing traffic volumes and operations. Supporting details for volumes and operations are provided in the appendix.

#### STUDY AREA ROADWAY NETWORK

Key roadways in the study area are summarized in Table 2 along with their existing roadway characteristics. The functional classification of Battle Creek Road SE, Delaney Road SE, and Parrish Gap Road SE are found in the Marion County Rural Transportation System Plan.<sup>2</sup>

TABLE 2: STUDY AREA ROADWAY CHARACTERISTICS (WITHIN THE VICINITY OF THE PROJECT)

ROADWAY	CLASSIFICATION	NO. OF LANES	POSTED SPEED	SIDWALKS	BIKE FACILITIES	ON- STREET PARKING
BATTLE CREEK ROAD SE	Major Collector	2	Not Posted	No	No	No
DELANEY ROAD	Arterial	2	55 mph	No	No	No
PARRISH GAP ROAD	Minor Collector	2	Not Posted	No	No	No

#### PEDESTRIAN AND BICYCLE FACILITIES

The project site is located in rural Marion County and there are no pedestrian or bicycle facilities on the study roadways.

# **PUBLIC TRANSIT**

There are no bus stops within 3 miles of the project site. There is one bus route provided by Cherriots that passes by the project site, Route 30X. This route provides service between Downtown Salem and Mill City.

#### SAFETY PERFORMANCE

A crash analysis for the study area was conducted based on the most recent five years (2014 - 2018) of collision data available. Collision data was obtained from the ODOT Crash Analysis

<sup>&</sup>lt;sup>2</sup> Figure 5-1, Marion County Rural Transportation System Plan, Updated 2005.

Reporting Unit website.<sup>3</sup> There were a total of seven collisions at the Delaney Road/Parrish Gap Road intersection and six collisions at the Delaney Road/Battle Creek Road intersection.

At the Delaney Road/Parrish Gap intersection, there was one fatal crash that occurred in 2016 in which a northbound left-turning vehicle failed to yield to the eastbound through vehicle on Delaney Road. The crash occurred during the daytime when it was raining. Five of the remaining six crashes were also turning related. One crash was a fixed object crash in which a northbound left turning vehicle ended up in the ditch on the north side of the intersection.

Of the six total crashes that occurred at the Delaney Road/Battle Creek Road intersection in the last five years (2014 – 2018), three resulted in a vehicle landing in the ditch on the south side of the intersection and two resulted in a vehicle hitting the bridge guardrail.

Table 3 summarizes the collision data for each intersection. As shown, both study intersections have calculated collision rates much higher than the 90th percentile collision rates.

TABLE 3: 2014 -2018 ODOT COLLISION SEVERITY BY LOCATION

INTERSECTION	cc	LLISION	NS BY SE	VERITY	(5-YEA	NR)	COLLISIONS	CALCULATED	90TH
INTERSECTION	FATAL	INJ. A	INJ. B	INJ. C	PDO	TOTAL	PER YEAR	COLLISION RATE A	PERCENTILE COLLISION RATE
DELANEY RD/ PARRISH GAP RD	1	0	0	1	5	7	1.4	0.814	0.475
DELANEY RD/ BATTLE CREEK RD	0	0	0	1	5	6	1.2	0.828	0.475

**BOLD/HIGHLIGHTED** = CALCULATED RATE EXCEEDS THE 90TH PERCENTILE RATE

A safety improvement project is currently being designed for the intersection of Delaney Road and Battle Creek Road. The project will replace the existing bridge on Delaney Road over Battle Creek and includes various intersection and roadway upgrades to improve traffic flow and safety. No additional safety improvements are recommended.

At the intersection of Delaney Road and Parrish Gap Road, there are several low-cost countermeasures that could improve safety.

- Install larger (or additional) Stop signs
- Install Stop Ahead pavement markings
- · Install double-wide Stop bars
- Increase retro reflectivity of Stop signs

A RATE CALCULATION = COLLISIONS / (AVERAGE DAILY TRAFFIC X 365 DAYS X NUMBER OF YEARS / 1 MILLION) [UNITS: CRASHES PER MILLION ENTERING VEHICLES]

<sup>3</sup>https://zigzag.odot.state.or.us/

#### **EXISTING TRAFFIC VOLUMES**

Existing AM and PM peak hour traffic operations were analyzed at the following study intersections.

- YWAM Existing Site Access Road/Battle Creek Road SE (minor street stop-controlled)
- Delaney Road SE/Battle Creek Road SE (stop-controlled southbound approach and stop-controlled eastbound left)
- Delaney Road SE/Parrish Gap Road SE (minor street stop-controlled)

Due to the COVID-19 closures of businesses and schools, current traffic counts were not able to be collected. Therefore, historical intersection turn movement counts at the two Delaney Road intersections (Battle Creek Road and Parrish Gap Road) from a previous transportation impact study<sup>4</sup> were utilized for this impact analysis and were factored to represent 2020 typical traffic conditions. Using the Salem Keizer Area Transportation Study (SKATS) travel demand model, the estimated average annual growth on study area roadways is 3% per year from 2017 to 2043. This average annual growth rate of 3% was applied to the 2017 traffic counts to estimate 2020 volumes.

It should be noted that no historical traffic counts were available at the YWAM Existing Site Access/Battle Creek Road intersection. Therefore, traffic volumes were developed for that intersection based on knowledge of the existing campus operations. The existing campus operations and traffic-related assumptions are discussed in the following section.

# **EXISTING YWAM CAMPUS OPERATIONS**

- The YWAM campus facilitates a variety of educational programs that last between one week and three months at a time.
- Site generated traffic volumes differ for a "Typical Day" and a "Peak Day". "Peak Days" occur 4-6 times per year, at the start or end of programs. The four highest volume days occur when students arrive for the largest educational program (once per quarter). Students can arrive over the course of a full week; however, a large portion of students arrive on a Wednesday ("Peak Day"). It was conservatively assumed that half of the students arrive on a peak day and half of those peak day trips arrive during the AM peak hour. Some students arrive in their personal vehicle while other arrive via bus or are dropped off by family.
- As part of the educational programs, all students reside on-campus and do not generate "commuter" type vehicle trips during the peak hours. Classes and school activities end at 5:00 p.m. each weekday. Some students and on-site staff leave to get dinner, run errands, etc. in the evening on a typical day.

<sup>&</sup>lt;sup>4</sup> YWAM Base Expansion Transportation Impact Analysis, Associated Transportation Engineering & Planning, Inc., March 1, 2017.

- Approximately 60% of existing staff (55 people) currently reside on-campus while the remaining 40% (40 people) reside off-campus. Off-campus staff generate inbound vehicle trips in the morning and outbound vehicle trips in the evening.
- The campus currently has capacity for approximately 120 students and 95 staff.
- On average, there are about 25 deliveries and 5 visitors to the campus per day.
- The majority of student and staff traffic is oriented to/from the north (Salem).

#### **EXISTING YWAM CAMPUS TRIP GENERATION**

Trip generation is the method used to estimate the number of vehicles added to site roadways and the adjacent roadway network by a development during a specified period (e.g. the PM peak hour). Table 4 provides the existing campus trip generation estimates based on staff-described operations. As shown, the campus currently generates the following number of trips:

Typical Day: 60 AM peak hour trips and 47 PM peak hour trips

• Peak Day: 110 AM peak hour trips and 72 PM peak hour trips.

TABLE 4: YWAM CURRENT TRIP GENERATION

1	OLIANITYTY	АМ Р	EAK HOU	R TRIPS	РМ РЕ	AK HOUR	TRIPS	DAILY WEEKDAY	
	QUANTITY	IN	OUT	TOTAL	IN	ОUТ	TOTAL	TRIPS	
STUDENTS	120	0	0	0	0	5	5	30	
ON-SITE STAFF	55	0	0	0	.0	2 -	2	10	
OFF-SITE STAFF	40	40	10	50	0	30	30	120	
GUESTS/DELIVERIES	25	5	5	10	5	5	10	60	
"TYPICAL	DAY" TOTAL	45	15	60	. 5	42	47	220	
STUDENTS	120	30	20	50	10	20	<b>30</b> .	160	
ON-SITE STAFF	55	0	0	0	0	2	2	10	
OFF-SITE STAFF	40	40	10	50	0	30	30	120	
GUESTS/DELIVERIES	25	5	5	10	5	5	10	60	
"РЕАК	DAY" TOTAL	75	35	110	15	57	· 72	350	

# **Comparison to Alternate Trip Generation Methods**

Typically, trip generation data from the Institute of Transportation Engineers (ITE) Trip Generation Manual would be used to estimate the traffic volume generated by a development. However, none of the land uses provided in the Trip Generation Manual capture the nature of the YWAM campus, which includes a variety of facility types all intended for use by patrons already on-site. The most

similar land use types, a community college or high school, are applicable to much larger sites (average enrollment of 11,900 and 1,500, respectively) and it would not be appropriate to apply those trip generation estimates to a small site like YWAM. Therefore, the Trip Generation Manual was not applied, but the estimated trips from relevant land uses are shown in Table 5 for comparison purposes.

TABLE 5: ITE TRIP GENERATION (FOR COMPARISON ONLY)

LAND USE	QUANTITY	AM PEAK HOUR TRIPS			PN	1 PEAK TRIP	DAILY WEEKDAY	
(ITE CODE)	•	IN	OUT	TOTAL	IN	OUT	TOTAL	TRIPS
LOW RISE APARTMENTS (221)	63 Dwelling Units	6	16	22	17	11	28	342
CAMPGROUND/RV PARK (416)	63 Occupied Camp Sites	5	8	13	12	6	18	-
HIGH SCHOOL (530)	120 students	41	21	62	8	9	17	244
COMMUNITY COLLEGE (540)	120 students	10	3	13	7	6	13	138

As shown in the table above, none of the individual land uses listed would generate more vehicle trips than what is shown in Table 4 for either the AM peak hour, PM peak hour, or a weekday when compared to the "Peak Day" trip generation in Table 4. If one of these land uses was evaluated to represent YWAM trip generation for this impact analysis, it would result in lower trip generation estimates and would not change the findings of the analysis.

The 2020 existing traffic volumes for a "Typical Day" are shown in Figure 1 on the following page. These volumes were used in the existing operating conditions analysis presented in this section (Table 6).

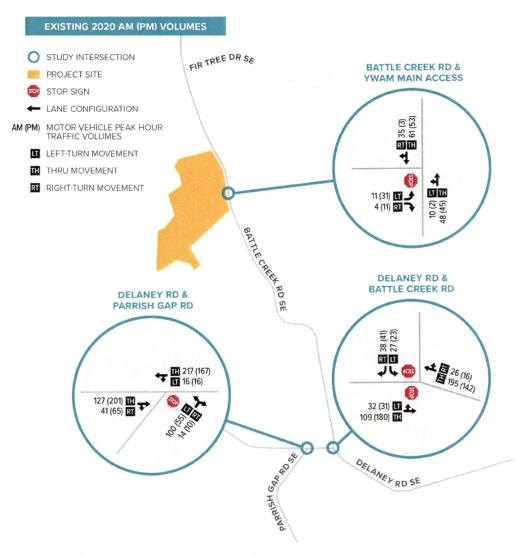


FIGURE 1: EXISTING "TYPICAL DAY" AM AND PM PEAK HOUR VOLUMES

# INTERSECTION PERFORMANCE MEASURES

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures that provide a good picture of intersection operations.

Level of Service (LOS): A "report card" rating (A through F) based on the average delay
experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic
moves without significant delays over periods of peak hour travel demand. LOS D and E are
progressively worse operating conditions. LOS F represents conditions where average vehicle
delay has become excessive and demand has exceeded capacity.

Volume-to-capacity (v/c) ratio: A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

# **REQUIRED OPERATING STANDARDS**

The study intersections are located within Marion County jurisdiction. All three intersections were analyzed as two-way stop controlled. The County's public work department states the following regarding operating standards.<sup>5</sup>

- All signalized and all-way stop controlled intersections shall operate at a Level of Service D
  or better (all individual movements shall operate at LOS E or better) with a
  Volume/Capacity ratio of 0.85 or less. (Not applicable)
- Other unsignalized intersections (including unsignalized private accesses) shall operate at **Level of Service E or better**, although LOS F may be allowed if the movement has a relatively low volume (as determined by County staff) and there is no indication that a safety problem will be created.

# **EXISTING OPERATING CONDITIONS**

Existing traffic operations at the study intersections were determined for the AM and PM peak hours based on the Highway Capacity Manual (HCM) 6th Edition methodology for unsignalized intersections.<sup>6</sup> The results were then compared with the Marion County minimum acceptable LOS operating standard of LOS E or better. Table 6 on the following page lists the existing v/c ratio, delay, and LOS of each study intersection.

It should be noted that the intersection of Delaney Road/Battle Creek Road has stop signs on the southbound and eastbound approaches with a "Right Turn Permitted Without Stopping" sign on the eastbound right turn. In order to analyze the intersection operations in Synchro, the intersection was assumed to be stop-controlled on the southbound approach (Battle Creek Road) only.

<sup>&</sup>lt;sup>5</sup> Marion County Dept. of Public Works, TIA Requirements, Methodologies and Analysis Parameters.

<sup>&</sup>lt;sup>6</sup> Highway Capacity Manual, 6th Edition, Transportation Research Board, 2016.

TABLE 6: EXISTING INTERSECTION OPERATIONS - "TYPICAL DAY"

*	OPERATING	AM PEAK HOUR			PM PEAK HOUR			
STUDY INTERSECTION	STANDARD	V/C RATIO	DELAY (SECS)	LOS	V/C RATIO	DELAY (SECS)	LOS	
DELANEY RD/ PARRISH GAP RD	LOS E	0.32	15.5	A/C	0.14	12.7	A/B	
DELANEY RD/ BATTLE CREEK RD	LOS E	0.08	13.2	A/B	0.05	12.0	A/B	
BATTLE CREEK RD/ YWAM SITE DRIVEWAY	LOS E	0.03	9.5	A/A	0.05	9.2	A/A	

#### TWO-WAY STOP CONTROLLED INTERSECTION:

v/c = Critical Movement Volume-to-Capacity Ratio Delay = Critical Movement Approach Delay (sec.) LOS = Level of Service (Major/Minor Road)

As shown, the existing intersection operations for all of the study intersections meet the County's operating standards.

#### PROJECT IMPACTS

This section reviews the impacts that the proposed YWAM campus expansion may have on the surrounding transportation network. This analysis includes a site plan evaluation, trip generation, trip distribution, and future year traffic volumes and operating conditions.

# PROPOSED DEVELOPMENT

The proposed expansion of the YWAM Salem campus is expected to be built in phases. The overall expansion will consist of the addition of student, staff, and couples housing, parking for recreational vehicles, expanded kitchen and dining rooms, a new assembly hall, and a sports field. The expansion will accommodate an additional 180 students. There is a proposed site driveway north of the existing driveway.

# TRIP GENERATION

As discussed in the *Existing Traffic Volumes* section, the trip generation for this impact analysis was based on knowledge of the existing campus operations and not using the ITE Trip Generation Manual. The campus expansion will increase the capacity of the site to accommodate an additional 180 students and 70 more staff (40 on-site and 30 off-site).

The net increase in trip generation for the campus expansion was calculated based on the existing traffic patterns and a proportional increase in students and staff. For example, the number of students is currently 120 students, which generate 30 trips on a typical day and 160 trips on a peak day. The expansion will add capacity for another 180 students, which is 150% of the current

capacity. Therefore, the additional students will generate an estimated net increase of 46 (30  $\times$  1.50) typical daily trips and 240 (160  $\times$  1.50) peak daily trips. This same method was applied to the daily and peak hour trip generation for students, on-site staff, and off-site staff. The expansion is expected to double the number of deliveries /guests.

**TABLE 7: YWAM EXPANSION TRIP GENERATION** 

	OUANTTTY	AM PEA	K HOUR	TRIPS	PM PE	AK HOUR	TRIPS	DAILY
	QUANTITY	IN	OUT	TOTAL	IN	OUT	TOTAL	WEEKDAY TRIPS
STUDENTS	180	0	0	0	0	8	8	46
ON-SITE STAFF	40	0	0	0	0	2	.2	8
OFF-SITE STAFF	30	30	8	38	0	23	23	90
GUESTS/DELIVERIES	25	5	5	10	5	5	10	60
"TYPICAL I	DAY" TOTAL	35	13	48	5	38	43	204
STUDENTS	180	45	30	75	15	30	45	240
ON-SITE STAFF	40	0	0	0	0	2	2	8
OFF-SITE STAFF	30	30	8	38	0	23	23	90
GUESTS/DELIVERIES	25	5	5	10	. 5	5	10	60
"PEAK I	DAY" TOTAL	80	43	123	20	60	80	398

## TRIP DISTRIBUTION

Trip distribution provides an estimate of where project-related trips would be coming from and going to. It is given as percentages at key gateways to the study area and is used to route project trips through the study intersections.

Based on the existing evening traffic counts, the distribution of existing traffic on Battle Creek Road is 20% to the north and 80% to the south. However, this is heavily influenced by commuter traffic between Salem and neighboring communities (traveling to Salem in the morning and leaving Salem in the evening). Per previous discussion about the campus operations, YWAM traffic is also oriented to/from Salem, but in opposite patterns (arriving from Salem in the morning, departing to Salem in the evening).

In an effort to conservatively estimate potential traffic impacts at the two study intersections located south of YWAM, a trip distribution of 50% to the north and 50% to the south on Battle Creek Road was applied to the student, guest, and delivery trips. A trip distribution of 80% to the north and 20% to the south on Battle Creek Road was applied to the staff trips (nearly all current

staff commute to and from Salem). Figure 3 shows both of the expected trip distributions and the project trip routing for the traffic generated by the campus expansion.

It should be noted that all of the project trips were assumed to use the existing site driveway (main access) on Battle Creek Road (worst case scenario). The proposed site driveway north of the existing driveway will primarily be used for the RV park, which will generate very low traffic volumes (a few trips per week).

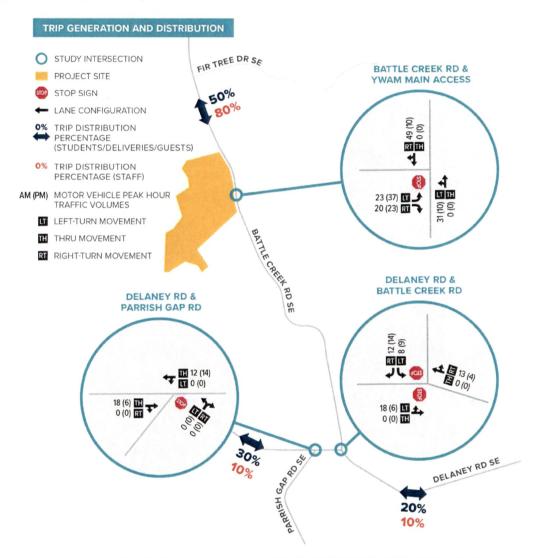


FIGURE 2: TRIP DISTRIBUTION AND "PEAK DAY" PROJECT TRIPS

#### **FUTURE ANALYSIS**

Future operating conditions were analyzed at the study intersections on a "Peak Day" for the 2025 Build scenario. This scenario was selected as it represents the highest level of traffic generated by the YWAM Salem campus.

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The traffic volumes for future year 2025 Build scenario were estimated by adding on five years of background growth (using an average annual growth rate of 3%) to the 2020 existing volumes in addition to the project trips associated with the campus expansion. These volumes are shown in Figure 3 on the following page.

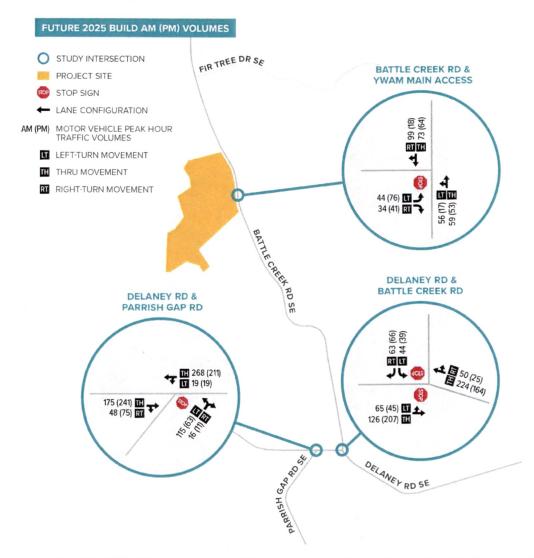


FIGURE 3: FUTURE BUILD "PEAK DAY" AM AND PM PEAK HOUR VOLUMES (2025)

#### **FUTURE INTERSECTION OPERATIONS**

Future traffic operations at the study intersections were determined for the AM and PM peak hour based on the Highway Capacity Manual (HCM) 6th Edition methodology for unsignalized intersections. Table 8 on the following page lists the estimated v/c ratio, delay, and LOS of each study intersection for the future 2025 Build scenario on a "Peak Day".

TABLE 8: FUTURE 2025 BUILD INTERSECTION OPERATIONS - "PEAK DAY"

	OPERATING	Al	PM PEAK HOUR				
STUDY INTERSECTION	STANDARD	V/C RATIO	DELAY (SECS)	LOS	V/C RATIO	DELAY (SECS)	LOS
DELANEY RD/ PARRISH GAP RD	LOS E	0.46	21.0	A/C	0.19	14.4	A/B
DELANEY RD/ BATTLE CREEK RD	LOS E	0,18	17.1	A/C	0.10	13.5	A/B
BATTLE CREEK RD/ YWAM SITE DRIVEWAY	LOS E	0.17	11.5	A/B	0.16	10.0	A/B

### **TWO-WAY STOP CONTROLLED INTERSECTION:**

v/c = Critical Movement Volume-to-Capacity Ratio

Delay = Critical Movement Approach Delay (sec.) LOS = Level of Service (Major/Minor Road)

As shown in the table above, all study intersections meet the County operating standard of LOS E under the 2025 Build scenario for a "Peak Day", with an average delay per vehicle of less than 15 seconds. Because this scenario has the highest level of traffic volumes, operations were not reported for a "Typical Day".

### SITE PLAN EVALUATION

The following site plan evaluation is based on the draft site plan provided by YWAM. The site plan can be found in the appendix.

#### SITE ACCESSES

There is one existing site driveway (main access) on Battle Creek Road. It is recommended that YWAM consider installing additional lighting or delineation near the main access and coordinate with Marion County about the potential for guide signage. The addition of lighting and guide signage will improve safety and make the campus entrance easier to find. Guide signage along Battle Creek Road (blue signs for key destinations) may also help visitors locate the property and site access, reducing the safety risks that unfamiliar drivers can introduce (slow speeds, distraction while navigating, and sudden stops).

## **ON-SITE CIRCULATION**

The proposed site plan shows the on-site vehicular circulation. At the main entrance, vehicles must pass the info center and the security gates. Beyond the security gates and to the north, there is access to a large parking lot, the assembly hall, and classrooms. If vehicles continue to the west, the internal roadway splits to the north and south taking vehicles to various facilities on the campus. All of the drive aisles on-site are shown as 24' wide, which is a sufficient width for two-way traffic.

On-site sidewalks and marked crosswalks are shown on the proposed site plan at key pedestrian connections between buildings. The on-site circulation appears to be sufficient for all modes of travel.

#### SIGHT DISTANCE

There is one existing site driveway (main access) on Battle Creek Road and there are no proposed changes to its location or function. The required intersection sight distance needed for left-turning vehicles to make a safe turn is 500 feet (based on a speed of 45 mph).<sup>7</sup> A preliminary sight distance evaluation was completed at the existing site driveway and the available sight distance exceeds the minimum required.

### **PROJECT FRONTAGE**

The project site frontage on Battle Creek Road (Major Collector) is required to meet Marion County's rural geometric cross section standards. The cross section standards for a rural collector road includes two 11' travel lanes and 5' gravel shoulders. Currently, the project site frontage along Battle Creek Road meets these cross-section requirements.

<sup>&</sup>lt;sup>7</sup>A Policy on Geometric Design of Highways and Streets, 7th Edition, AASHTO, 2018.

<sup>&</sup>lt;sup>8</sup> Table 2, Engineering Standards, Marion County Public Works Department, Adopted April 11, 1990.

# PROJECT SUMMARY

The Salem campus of Youth With a Mission (YWAM) is proposing an expansion to accommodate future growth and improved facilities. Although the expansion will occur in phases, this traffic impact analysis evaluated full buildout of the expansion, which is expected to occur by 2025.

- The campus expansion will increase the capacity of the campus by 180 students and 70 staff. The proposed expansion will generate the following estimated net increase in traffic:
  - Typical Day: 48 AM peak hour trips and 43 PM peak hour trips
  - Peak Day: 123 AM peak hour trips and 80 PM peak hour trips.
- All study intersections meet County operating standards for a Peak Day in 2025. No mitigations
  are recommended.
- The intersection of Delaney Road/Battle Creek Road has a higher than expected frequency of crashes (based on 2014-2018 crash data). Marion County is currently designing upgrades to this intersection to improve traffic flow and safety. The amount of traffic added to this intersection by the YWAM expansion is not likely to have a significant effect on the safety performance of the intersection. No additional mitigations are recommended.
- The intersection of Delaney Road/Parrish Gap Road has a higher than expected frequency of crashes (based on 2014-2018 crash data). The amount of traffic added to this intersection by the YWAM expansion is not likely to have a significant effect on the safety performance of the intersection. However, because no improvement projects are planned by the County, it is recommended that YWAM coordinate with Marion County to facilitate installation of one or more low-cost safety countermeasures (signing and striping).
- To improve safety at the existing main access, it is recommended that additional lighting, delineation, and/or signing be installed to improve visibility of the access. Guide signage along Battle Creek Road (blue signs for key destinations) may also help visitors locate the property and site access, reducing the safety risks that unfamiliar drivers can introduce (slow speeds, distraction while navigating, and sudden stops).

# **APPENDIX**

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# APPENDIX A: TRAFFIC COUNT DATA

# Traffic Impact Analysis YWAM Base Expansion

Marion County, Oregon

March 2, 2017

completed with

MultiTech Engineering Services, Inc

Salem, Oregon

Prepared by: Associated Transportation Engineering & Planning, Inc. Salem, Oregon March 1, 2017 16-340 YWAM Base Expansion TIA



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# Traffic Impact Analysis YWAM Base Expansion

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# **Appendices**

**Turning Movement Counts** 

**ODOT Crash Data** 

Computer Modeling Printouts are on the enclosed CD

# Traffic Impact Analysis YWAM Base Expansion Marion County, Oregon



# Introduction:

Youth with a Mission (YWAM) Oregon base intends to expand on its existing site. Located on tax lots 100, 300, 400, 500, 600, 700, 800 and 1001 of tax map 8S3W25B in Marion County, Oregon, the 31.7 acre site is west of Battle Creek Rd and north of Delaney Rd in Marion County. The site will be expanded with access to Battlecreek Rd using the existing site access.

Residents of the YWAM base will use the Marion County transportation system and add traffic to the roadways. This analysis will consider the traffic impacts at the intersections of 1) The site access at Battle Creek Rd 2) Battle Creek Rd at Delaney Rd and 3) Delaney Rd at Parish Gap Rd. Crash data was provided by the ODOT Crash Data Unit for the most recent 5 years.

# **Summary of Findings:**

The planned expansion of the YWAM base will generate an estimated 67 AM Peak hour trips and 70 PM Peak hour trips. The performance metrics at the studied intersections when the expansion is complete are shown in the following table with traffic from the .



Figure 1 - Vicinity Map

	AM Peak	hour	PM Peak	hour
	LOS	v/c	LOS	v/c
Access at Battle Creek Rd	A	0.005	A	0.011
Delaney Rd at Parish Gap Rd	В	0.219	В	0.094
Battle Creek Rd at Delaney Rd	A	0.336	A	0.255

Crash data from ODOT Crash Data Unit shows there were 6 crashes at the studied intersections in the last 5 years. None were fatal crashes, 2 were injury crashes and 4 were property damage only crashes.

# **History and Existing Conditions:**

The site is in rural Marion County is primarily open space. YWAM has been based on the property for many years and plans to add buildings on the site. The plan is to add 12 RV spaces (ITE 416), a 200 seat dining room, with dorms and a classroom for 300 persons. (This study will assume the trip generation is very similar to a university with 300 students (ITE 550)). 18 apartments (ITE 220) for staff and 8 hospitality units (ITE 220) for guests. Traffic from the planned additions will travel east to Battle Creek Rd and north toward Salem (20 % of trips) or south toward I-5 (50% of trips) or Turner (30% of trips).

Figure 2 shows the existing AM Peak hour and PM Peak hour performance metrics with existing traffic volumes.

iD	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	YWAM Battle Creek Access	Two-way stop	HCM 6th Edition	EB Left	0.000	9.1	А
2	Delaney Rd at Parish Gap Rd	Two-way stop	HCM 6th Edition	NEB Left	0.206	13.2	В
3	Delaney Rd at Battle Creek Rd	All-way stop	HCM 6th Edition	NB Left	0.309	8.9	Α.

Existing AM Peak Hour Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	YWAM Battle Creek Access	Two-way stop	HCM 6th Edition	EB Left	0.000	9.1	А
2	Delaney Rd at Parish Gap Rd	Two-way stop	HCM 6th Edition	NEB Left	0.090	11.8	В
3	Delaney Rd at Battle Creek Rd	All-way stop	HCM 6th Edition	NB Left	0.229	8.3	А

**Existing PM Peak Hour Summary** 

Figure 2 - Existing Traffic Conditions

# Traffic Conditions when additions at the YWAM base are complete:

The YWAM base would like to add 12 RV spaces (ITE 416), a 200 seat dining room, with dorms and a classroom for 300 persons. (This study will assume the trip generation is very similar to a university with 300 students (ITE 550)). 18 apartments (ITE 220) for staff and 8 hospitality units (ITE 220) for guests. The trip generation assumptions are summarized in the following table. The base additions will add 67 trips to the AM Peak hour traffic and 70 trips to the PM Peak hour traffic.

Use (ITE Code)	Number of Units	AM Peak Rate	New AM Trips	PM Peak Rate	New PM Trips
RV Space (416)	12 spaces	0.12/space	3	0.27/space	3
University (550)	300 students	0.17/student	51	0.17/student	51
Apartments (220)	18 apartments	0.51/apt	9	0.62/apt	11
Hospitality (220)	8 apartments	0.51/apt	4	0.62/apt	5
Total			67 Trips		70 Trips

This study will assume that 20% of the traffic will travel on Battle Creek Rd north of the site and 80 % on Battle Creek Rd south of the site.

iD .	Intersection Name	Control Type	Method	Worst Mymt	V/C	Delay (s/veh)	LOS
1	YWAM Battle Creek Access	Two-way stop	HCM 6th Edition	EB Left	0.005	9.7	А
2	Delaney Rd at Parish Gap Rd	Two-way stop	HCM 6th Edition	NEB Left	0.219	13.8	В
3	Delaney Rd at Battle Creek Rd	All-way stop	HCM 6th Edition	NB Left	0.336	9.2	Α

2017 AM Peak Hour Summary with YWAM base additions

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	YWAM Battle Creek Access	Two-way stop	HCM 6th Edition	EB Left	0.011	9.6	А
2	Delaney Rd at Parish Gap Rd	Two-way stop	HCM 6th Edition	NEB Left	0.094	12.1	В
3	Delaney Rd at Battle Creek Rd	All-way stop	HCM 6th Edition	NB Left	0.255	8.5	Α

2017 PM Peak Hour Summary with YWAM base additions

Figure 3 – 2017 Traffic Conditions with YWAM base additions

# Crash Data:

The ODOT Crash Data Unit provided the following information about reported crashes at the shown intersections for the past 5 years.

Intersection	Fatal	Injury	Property Damage	Total Crashes
Battle Creek Rd @ Delaney Rd	0	2	2	4
Parrish Gap Rd @ Delaney Rd	0	0	2	2

Figure 4 - Reported Crashes at Studied Intersections in 2010-2014

# **Summary:**

The planned expansion of the YWAM base in Marion County will add traffic to the transportation system. This study finds there is and will continue to be adequate capacity at the studied intersections when the additions are completed. Crash data from ODOT does not indicate significant safety problems at the intersections.

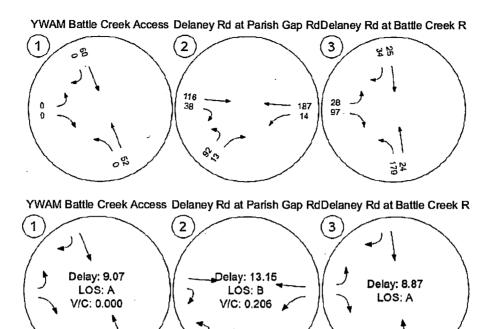


Figure 5 - Existing AM Peak hour Counts and Performance Metrics

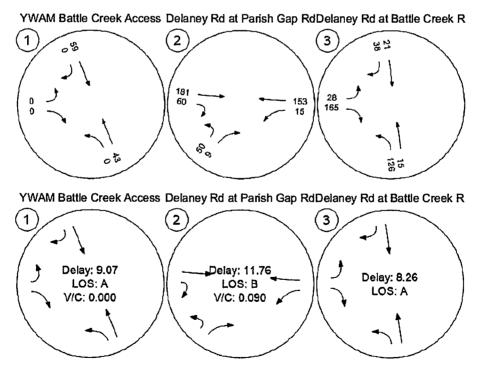


Figure 6 - Existing PM Peak hour Counts and Performance Metrics

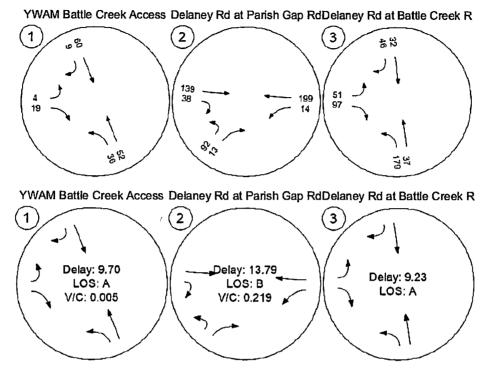


Figure 7 - 2017 AM Peak hour Counts and Performance Metrics with YWAM Base

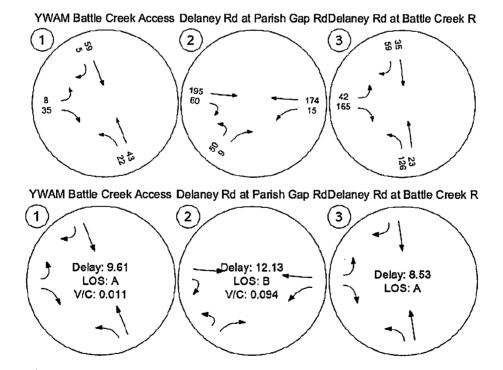


Figure 8 - 2017 PM Peak hour Counts and Performance Metrics with YWAM Base

# APPENDIX B: SITE TRIP GENERATION

#### Assumptions:

- \*Students arrive once per quarter over the course of a full week, with the largest number of students arriving on a Wednesday. Assumed 1/2 of students arrive on peak day, and 1/2 of those arrive during AM peak
- \*School day ends at 5pm. Some students and on-site staff leave to get dinner, run errands, etc. in the evening
- \*Deliveries are pretty consistent throughout the day
- \*Students and staff tend to carpool. To be conservative, assume each student is one vehicle.
- \*All facilities are intended to serve on-site operations. Assembly hall \*may\* be rented out in the future, but likely not coinciding with school days (e.g., on a weekend)



On-Site Students On-Site Staff Off-Site Staff Deliveries/guests Total

							c IIIba					
			Typic	al Day				Pe	eak Day (4-6	times per yea	er)	
	AM In	AM Out	PM In	PM Out	Daily In	Daily Out	AM In	AM Out	PM In	PM Out	Daily In	Daily Out
120	0	0	0	5	15	15	30	20	10	20	80	80
55	0	0	0	2	5	5	0	.0	. 0	2	5	5
40	40	10	0	30	60	60	40	10	0	30	60	60
25	5	5	.5	5	30	30	5	5	5	. 5	30	30
	45	15	5	42	110	110	75	35	15	57	175	175

# Future@padity(end of@hase4)

On-Site Students On-Site Staff Off-Site Staff Deliveries/guests Total

Vehicle Tr	Ìр
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	Typical Day							Pi	eak Day (4-6	times per yea	ar)	
	AM In	AM Out	PM In	PM Out	Daily In	Daily Out	AM In	AM Out	PM In	PM Out	Daily In	Daily Out
300	. 0	0	0	13	38	38	75 <sub>v</sub>	50	25	50	200	200
95	0	0	0	4	9	9	0 -	. 0	0 ,	4	9	9
70	- 1.70	18	0	53	105	105	70	18.	0	53	105	105
50	10	10	10	10	60	60	10	10	. 10	10	60	60
	80	28	10	80	212	212	155	78	35	117	374	374



On-Site Students On-Site Staff Off-Site Staff Deliveries/guests Total

#### Vehicle Trips

			Typic	al Day		,		Pe	eak Day (4-6	times per yea	ar)	
	_ AM In	AM Out	PM In	PM Out	Daily In	Daily Out	AM In	AM Out	PM In	PM Out	Daily In	Daily Out
180	. 0	0	0	8	23	23	45	30	15	30	120	120
40	. 0	0 ,	. O-	2	4	4	0.	. 0	0.	2	4 -	4
30	. 30	8	0	23	45	45	30	- 8	0	23	· 45	45
25	⇔5	5	5	5	30	30	5	. 5	5	5	30	30
	35	13	5	38	102	102	80	43	20	60	199 .	199

# APPENDIX C: CRASH DATA

DKS INTX#	001 Crash ID	005 Crash Hour	009 Jurisdiction	012 Hwy Number	014 Street Name	015 Intersecting Street Name
1	1667586	1P	Marion County		DELANEY RD SE	PARRISH GAP RD SE
1	1633507	5P	Marion County		DELANEY RD SE	PARRISH GAP RD SE
1	1734780	4P	Marion County		DELANEY RD SE	PARRISH GAP RD SE
1	1654857	5P	Marion County		DELANEY RD SE	PARRISH GAP RD SE
1	1704162	3A	Marion County		DELANEY RD SE	PARRISH GAP RD SE
1	1766733	5P	Marion County		DELANEY RD SE	PARRISH GAP RD SE
1	1550493	4P	Marion County	;	PARRISH GAP RD SE	DELANEY RD SE
2	1764275	5P	Marion County		BATTLECREEK RD SE	DELANEY RD SE
2	1806974	5P	Marion County		BATTLECREEK RD SE	DELANEY RD SE
2	1641662	6A	Marion County		BATTLECREEK RD SE	DELANEY RD SE
2	1554160	9A	Marion County		BATTLECREEK RD SE	DELANEY RD SE
2	1557014	10P	Marion County		DELANEY RD SE	BATTLECREEK RD SE
2	1565036	7A	Marion County		DELANEY RD SE	BATTLECREEK RD SE

018 Latitude	019 Longitude	021 Collision Type	022 Crash Cause	024 Crash Severity Detail	026 Lighting	030 Traffic Control
44.84130556	-122.9931722	TURN	NO-YIELD	Fatal	DAY	STOP SIGN
44.84130556	-122.9931722	TURN	NO-YIELD	PDO	DAY	STOP SIGN
44.84130556	-122.9931722	TURN	NO-YIELD	Possible Injury	DAY	STOP SIGN
44.84130556	-122.9931722	TURN	NO-YIELD	PDO	DAY	STOP SIGN
44.84130556	-122.9931722	FIX	IMP-TURN	PDO	DARK	STOP SIGN
44.84130556	-122.9931722	TURN	NO-YIELD	PDO	DAY	STOP SIGN
44.84130588	-122.9931726	TURN	IMP-TURN	PDO	DAY	STOP SIGN
44.84129167	-122.9915333	FIX	TOO-FAST	PDO	DAY	STOP SIGN
44.84129167	-122.9915333	TURN	F AVOID	PDO	DAY	STOP SIGN
44.84129167	-122.9915333	FIX	DEF BRKE	PDO	DAY	STOP SIGN
44.84129129	-122.9915338	FIX	IMP-TURN	PDO	DAY	STOP SIGN
44.84129129	-122.9915338	FIX	TOO-FAST	Possible Injury	DARK	STOP SIGN
44.84129129	-122.9915338	FIX	IMP-TURN	PDO	DAY	UNKNOWN

Year of 002 Crash Date	006 Region	007 County	035 Bike or Ped Flag group	038 Road Dept Flag	039 Intersection Flag	041 State Hwy Flag	
2016	2	Marion	Neither	No	Yes	No	
2015	2	Marion	Neither	No	Yes	No	
2017	2	Marion -	Neither	No	Yes	No	
2015	2	Marion	Neither	No	Yes	No	
2016	2	Marion	Neither	Yes	Yes	No	
2017	2	Marion	Neither	No	Yes	No	
2014	2	Marion	Neither	No	Yes	No	
2017	2	Marion	Neither	Yes	Yes	No	
2018	2	Marion	Neither	No	Yes	No	
2015	2	Marion	Neither	Yes	Yes	No	
2014	2	Marion	Neither	Yes	Yes	No	
2014	2	Marion	Neither	Yes	Yes	No	
2014	2	Marion	Neither	Yes	Yes	No	

002 Crash Date	003 Crash Year	004 Crash Day	008 City Name	010 Urban Area	011 Hwy Name	016 Direction From Int	020 Crash Type
9/2/2016	2016	2		·		9	ANGL-OTH
2/13/2015	2015	13				9	ANGL-OTH
8/14/2017	2017	14				9	ANGL-OTH
2/13/2015	2015	13				9	ANGL-OTH
7/23/2016	2016	23				7	FIX OBJ
10/7/2017	2017	7				9	ANGL-OTH
1/13/2014	2014	13				5	ANGL-STP
9/17/2017	2017	17				1	FIX OBJ
6/19/2018	2018	19				7	S-OTHER
7/29/2015	2015	29	]			3	FIX OBJ
3/11/2014	2014	11		<u>.                                      </u>		3	FIX OBJ
5/4/2014	2014	4		,		0	FIX OBJ
9/11/2014	2014	11	·			0	FIX OBJ

023 Crash Event	025 Crash Severity Categ	027 Road Surface	028 Weather	031 Road Character	032 Posted Speed	033 Median Type
HILL INV	FAT	WET	RAIN	INTER	55	<del>                                     </del>
	PDO	DRY	CLR	INTER		
	INJ	DRY	CLR	INTER		1
	PDO	DRY	CLR	INTER		
DITCH	PDO	DRY	CLR	INTER		
	PDO	DRY	CLR	INTER		<u> </u>
	PDO	DRY	CLR	INTER		
GARDRAIL	PDO	WET	RAIN	INTER		
	PDO	DRY	CLR	INTER	1	
DITCH	PDO	DRY	CLR	INTER		
DITCH	PDO	UNK	UNK	INTER	,	
DITCH	INJ	UNK	UNK	INTER		<u> </u>
BR RAIL	PDO	DRY	CLR	INTER		<del></del>

034 Func Class	035 Bike or Ped Flag	036 Bike Flag	037 Ped Flag	040 Driveway Rel Flag	042 Speeding Flag	043 Alcohol Flag	044 Drug Flag
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	TRUE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MJ-COL	Neither	No	No	FALSE	TRUE	FALSE	FALSE
R MN-ART	Neither	No .	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE
R MN-ART	Neither	No	No	FALSE	TRUE	TRUE	FALSE
R MN-ART	Neither	No	No	FALSE	FALSE	FALSE	FALSE

045 Marijuana Flag	046 Lane Rdwy Dep Flag	047 Off Rdwy Flg	048 School Zone Flag	049 Work Zone Flag	050 Bike Under 21 Flag
FALSE	N	FALSE			No
FALSE	N	FALSE			No
FALSE	N	FALSE	0	0	No
FALSE	N	FALSE			No
FALSE	N	TRUÉ	0	0	No
FALSE	N	FALSE			No
FALSE	N	FALSE			No
FALSE	N	TRUE	0	0	No
FALSE	N	FALSE			No
FALSE	N	TRUE	0	0	No
FALSE	N	TRUE			No
FALSE	N	TRUE	0	0	No
FALSE	N	TRUE	"		No

051 Driver Under 21 Flag	052 Ped Under 21 Flag	053 Bike Over 64 Flag	054 Driver Over 64 Flag	055 Ped Over 64 Flag	056 Veh1 Action
No	No	No	Yes	No	NONE
No	No	No	No	No	NONE
No	No	No	Yes	No	NONE
Yes	No	No	No	No	NONE
No	No	No	No	No	NONE
No	No	No	No	No	NONE
No	No	No	No	No	NONE
No	No	No	No	No	NONE
No	No	No	No	No	NONE
No	No	No	No	No	NONE
Yes	No	No	No	No	NONE
No	No	No	No	No	NONE
No	No	No	No	No	NONE

057 Veh1 Movement	058 Veh1 From Direction	059 Veh1 To Direction	060 Veh1 Event	061 Veh1 Type	062 Veh1 Striking Flag
STRGHT	W	E		PSNGR CAR	TRUE
TURN-L	S	W .		PSNGR CAR	TRUE
STRGHT	W	E		PSNGR CAR	TRUE
TURN-L	S	W	• .	PSNGR CAR	TRUE
TURN-L	S	Ŵ		PSNGR CAR	TRUE
UNK	UN	UN		PSNGR CAR	TRUE
TURN-R	W	S		PSNGR CAR	TRUE
TURN-L	S	W		PSNGR CAR	TRUE
STRGHT	W	E		PSNGR CAR	TRUE
STRGHT	W	E	DITCH	SEMI TOW	TRUE
TURN-R	W	S	DITCH	PSNGR CAR	TRUE
TURN-R	W	S	DITCH	PSNGR CAR	TRUE
TURN-R	N	W	BR RAIL	PSNGR CAR	TRUE

063 Veh1 Hit-Run Flag	064 Veh1 Speed Flag	065 Veh2 Action	066 Veh2 Movement	067 Veh2 From Direction	068 Veh2 To Direction
FALSE	FALSE	GO A/STOP	TURN-L	S	W
FALSE	FALSE	NONE	TURN-L	E	S
FALSE	FALSE	GO A/STOP	TURN-L	S	W
FALSE	FALSE	NONE	TURN-L	E	S
FALSE	FALSE				
FALSE	FALSE	NONE	STRGHT	W	E
FALSE	FALSE	STOPPED	STOP	S	N
FALSE	FALSE				-
FALSE	FALSE	STOPPED	STOP	W	E
FALSE	FALSE				-
FALSE	FALSE				
FALSE	FALSE				- <del>  </del>
FALSE	FALSE		·	7-7-	

069 Veh2 Event	070 Veh2 Type	071 Veh2 Striking Flag	072 Veh2 Hit-Run Flag	073 Veh2 Speed Flag	074 Driver1 AGE	075 Driver1 Error
	PSNGR CAR	FALSE	FALSE	FALSE	35	NONE
	PSNGR CAR	FALSE	FALSE	FALSE	30	NO ROW
	PSNGR CAR	FALSE	FALSE	FALSE	32	NONE
	PSNGR CAR	FALSE	FALSE	FALSE	31	NO ROW
		FALSE	FALSE	FALSE	0	NONE
	PSNGR CAR	FALSE	FALSE	FALSE	0	NONE
	PSNGR CAR	FALSE	FALSE	FALSE	26	WIDE TRN
		FALSE	FALSE	FALSE	0	NONE
	PSNGR CAR	FALSE	FALSE	FALSE	0	NONE
		FALSE	FALSE	FALSE	58	UNSF VEH
		FALSE	FALSE	FALSE	19	WIDE TRN
		FALSE	FALSE	FALSE	62	BASCRULE
		FALSE	FALSE	FALSE	38	CUT CORN

076 Driver1 Cause	077 Driver1 Alcohol Flag	078 Driver1 Drug Flag	079 Driver1 MJ Flag	080 Driver2 AGE	081 Driver2 Error
NO CODE	0	0		89	NO ROW
NO-YIELD				0	NONE
NO CODE	0	0	3	66	NO ROW
NO-YIELD				20	NONE
NO CODE	1				
NO CODE			1	0	NONE
IMP-TURN				54	NONE
NO CODE	0	0	3		
NO CODE				0	NONE
NO CODE	0	0			
IMP-TURN					
TOO-FAST	1				
IMP-TURN					

082 Driver2 Cause	083 Driver2 Alcohol Flag	084 Driver2 Drug Flag	085 Driver2 MJ Flag	086 Partic Type	088 Partic Action
NO-YIELD	9	9			
NO CODE					
NO-YIELD	0	0	3		
NO CODE					
NO CODE		<u> </u>			
NO CODE	-				
NO CODE					
					1

089 Partic Movement	090 Partic Location	091 Partic From Direction	092 Partic To Direction	093 Partic Error	094 Partic Cause
			·		,
	·				
<u> </u>					
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	•				

095 Partic Alcohol Flag	096 Partic Drug Flag	097 Partic MJ Flag	013 Hwy MP	017 Distance From Int	029 Lane Quantity	087 Partic Age
			4.159999847			
			4.159999847			
			4.159999847			
-			4.159999847	,		
			4.159999847			
			4.159999847			
			9.010000229			
			0			
			0			
			0			
			4.239999771			
			4.239999771			

098 Tot Fatal Cnt	099 Tot Inj Cnt	100 Tot Inj A Cnt	101 Tot Inj B Cnt	102 Tot Inj C Cnt	103 Tot Ped Cnt	104 Tot Bike Cnt
1	1	0	0	1	0	0
0	0	0	0	0	0	0
0	2	0	0	2	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	1	0	0	1	0	0
0	0	0	0	0	0	О

Fatal and Seriou Injury
0
0
0
0
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0
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0 0 0 0
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# APPENDIX D: HCM REPORTS - EXISTING

							<del></del>
Intersection	- Aat						
Int Delay, s/veh	3.7						
Movement E	BT EBF	R WBL	WBT NBL	NBR			
Lane Configurations	<b>}</b>		4 W				
	27 4	16	217 100	14			
Future Vol, veh/h	27 4	16	217 100	14			terme Winner state in Especial Calabata Continuarion W. di Sentitica da El Articum del America del
Conflicting Peds, #/hr	0 (	0	.0. 0	0	1		
	ree Free	Free	Free Stop	Stop			***************************************
RT Channelized	- None	-	None -	None	*		
Storage Length	_		- 0	_		And the second s	ny mpanamana ny norany ao amin'ny faritr'i Norana ao
Veh in Median Storage, #	0		0 0	- 1 - 2 - 2			And the state of t
Grade, %	0		0 0		addin Maddinia - angli in by Milliothia des-Austria, a thagan nga anga - a an - a ata		
Peak Hour Factor	70 70	70	70 70	70	Antonia series considerar en material survivar de la manda en es	s	- a hade reconstitutional management and marketings.
Heavy Vehicles, %	2	1	2 1	1			artumus — " Ericeanics annualities amening annual artumus artumus artumus annual annual annual annual annual a
	81 59	23	310 143	20	e eriner reimi. <del>an in mesaren erinera kanamarjan in mesaria</del> -		
Separation resident distance filmous annual top graph them includes representative properties.					Phasiti-de-in-lement inde-entirinantes (Inser-1880) (1986) (Insertable California) (Inser-	and the second s	
Major/Minor Major	or1	Major2	Minor1				
Conflicting Flow All	0 (		0 567	211			
Stage 1	-		- 211		A CONTRACTOR OF THE PROPERTY O	T. Schrödighreite executation	
Stage 2			- 356	<u> </u>	maka di karamani mangan ayak sa ma mara yangga mpi iyara ayanga ili maji iya yangan		أب د محمد محمد محمد محمد محمد
Critical Hdwy	- 3	4.11	- 6.41	6.21	e e e e e e e e e e e e e e e e e e e	S	
Critical Hdwy Stg 1		-	- 5.41				or a succession and the second
Critical Hdwy Stg 2	- 34.		- 5.41			·	
Follow-up Hdwy		2.209	- 3.509	3.309			
Pot Cap-1 Maneuver		1333	- 487	832			
Stage 1		-	- 827	-	ran sandansari, yanaman arawan arawan a	**************************************	
Stage 2	- 7.5.	· · ·	- 711		,		
Platoon blocked, %		<del>.</del>			and the second s	<del>, amin' ao amin' ao amin' ao amin'</del>	
Mov Cap-1 Maneuver		1333	- 477	832		, , , , , , , , , , , , , , , , , , ,	* * }
Mov Cap-2 Maneuver			- 477	-	and the second s		
Stage 1			- 827	<b>-</b> %	*	·	
Stage 2			- 696	-	- And the same of the same of the same	The state of the theory and the state of the	
		,					The second section of the second second section of the section of the second section of the secti
Approach	EB	WB	NB				
HCM Control Delay, s	0	0.5	15.5		The same of the sa	220 1 20 1 1	The state of the s
HCM LOS			· C	enangilana ara-maranasanan tarapita magatirananga	The state of the s		أسيسينين غياده ويبائب سيداليسيوليب الإياضياتين متاكمها والمراد
			* 7.3				Salar Sa
Minor Lane/Major Mymt	NBLn1	EBT	EBR WBL	WBT			
Capacity (veh/h)	503		- 1333				37 (2004) 1985 (2004) 1985 (2004) 1985 (2004) 1985 (2004) 1985 (2004) 1985 (2004) 1985 (2004) 1985 (2004) 1985
HCM Lane V/C Ratio	0.324		- 0.017			<del></del>	a company of the comp
HCM Control Delay (s)	15.5		- 7.7	0			
HCM Lane LOS			- A	A		- W.	Lindre management of the second
HCM 95th %tile Q(veh)	1.4		- 0.1	-			

Intersection	a - ize Westel	****	7*: 1-		- 1					_
Int Delay, s/veh	2.3									
Movement	EBL	EBT	WBT	WBR SBL	SBR					
Lane Configurations		4	<u>-</u>	1	<u> </u>		· <del></del> ·			
Traffic Vol, veh/h	32	109	195	26 27	38	A-00-11-1-17-	** 1			
Future Vol, veh/h	32	109	195	26 27	7 38					
Conflicting Peds, #/hr	.0.	-0	0	0 (	) 0		-			
Sign Control	Free	Free	Free	Free Stop	Stop					
RT Channelized		None	_	None	- None					
Storage Length	-	-	-	- (	25					
Veh in Median Storage	,# -	0	0	- (	) -		and a state of the	Anne Special S		
Grade, %	-	0	0	- (						
Peak Hour Factor	70	70	70	70 70	70					
Heavy Vehicles, %	1	2	2	1 1						
Mvmt Flow	46	156	279	37 39	54					
Major/Minor N	/lajor1	<u>I</u>	Major2	Minor2	)		1. 1. 1.		CALL SECTION OF THE PARTY OF TH	
Conflicting Flow All	316	0	viajuiz	0 546				-		
Stage 1	310			- 298			The state of the s			<del>,</del>
Stage 2				- 248						
Critical Hdwy	4.11	_	<u>-</u> _	- 240 - 6.41		<del></del>			and the state of t	1
Critical Hdwy Stg 1	7.11		Livery and a state of the state	- 5.41		**************************************			and a singularity and a second	أنسد
Critical Hdwy Stg 2				- 5.41				ىسىرىسىشىدىنى يىلىسىسىدىن. ئا		
	2.209			- 3.509			er en			
Pot Cap-1 Maneuver	1250			- 500			and in the second secon			
Stage 1	- 1200			- 755			and recommendations are			
Stage 2				- 796						
Platoon blocked, %					<u></u>					
Mov Cap-1 Maneuver	1250			- 480	744	····			<del> </del>	
Mov Cap-2 Maneuver		<del></del>		- 480						لست
Stage 1		<del>-</del>		- 725				-00 of the temperature of the te	***	
Stage 2	_		_	- 796			-			لمينس
	. '		<del></del>	2.0	· · · · · · · · · · · · · · · · · · ·		St. 1845	* 1	and the second s	
bearing and a second					<del></del>					
Approach	EB		WB	: SE						
HCM Control Delay, s	1.8		0	11.4						j
HCM LOS	-		<del></del> -	E	······································					
and assert one conservation by a second conservation and			-2-24		<del></del>					}
Minor Lane/Major Mvm	E .	EBL	EBT	WBT WBF	<del>_</del>					
Capacity (veh/h)		1250			- 480	744				
HCM Lane V/C Ratio		0.037	-			0.073				
HCM Control Delay (s)		- 8	0		13.2	10.2		and the spiritual representation in the		
HCM Lane LOS		Α	Α		- B	В				****
HCM 95th %tile Q(veh)		0.1			0.3	0.2				آ

				-						<del></del>		
ntersection			7,74		*-			195%				
Int Delay, s/veh	1.3											
Movement	EBL	EBR	NBL	NBT	SBT	SBR						
Lane Configurations	N/F			4	ĵ→							
Traffic Vol, veh/h	11	4	10	48	61	35	,		2 ' 2			
Future Vol, veh/h	11	4	10	48	61	35			A. PRESIDENT S. S. CATALON SERVICE PRINCIPLE P	MARINE	<del>Part May Arthur Stayl Mary and David Stayl Arthur Arthur Arthur and Arthur</del>	
Conflicting Peds, #/hr	0.	0	0	0	0	0						
Sign Control	Stop	Stop	Free	Free	Free	Free			and the second s	and the second control of the second control	rentre - 1990anu Bijakakishtekarisatashalari	
RT Channelized		None	-	None	-	None	-	,				
Storage Length	0	_	-	-	-	-						
Veh in Median Storage,	# 0		-	0 :	0	-	, 's antidave even		ing the control of th			
Grade, %	0	_	_	0	0		THE REPORT AND ADDRESS OF THE PARTY OF THE P		CONTRACTOR DATE OF THE SECOND	COMPANIENCE TO A PROPERTY OF THE PARTY OF TH		
Peak Hour Factor	70	70	70	70	70	70	y,			-		
Heavy Vehicles, %	0	0	0	1	1	0					and the state of t	
Mvmt Flow	16	6	14	69	87	50	77					
Eppingsi Minel England Service Challer Give and Piller his interpolation public public lead of Conservice												
Major/Minor W	linor2	N	/lajor1	<b>N</b>	/lajor2	<del></del>	-	-				<del></del>
Conflicting Flow All	209	112	137	0	-	0			-		*****	
Stage 1	$-\frac{203}{112}$	112	<del>- 101</del>		<u>-</u>	<del>-</del>						
Stage 2	97							·				
Critical Hdwy	6.4	6.2	4.1							- ,		
Critical Hdwy Stg 1	5.4	U.Z					··				المستحديث فيأم فهالمه مستواسي	
Critical Hdwy Stg 2	5.4											
Follow-up Hdwy	3.5	3.3	2.2								,	
Pot Cap-1 Maneuver	784	947		<del></del>			···					
Stage 1	918	371	1700				· -					
Stage 2	932						· 9		- 2			<del></del> -
Platoon blocked, %	302						<u> </u>			10 kg kg		
Mov Cap-1 Maneuver	776	947	1459					····	waren - waren or a second or a second or a			
Mov Cap-2 Maneuver	776	- 271	1700			_	******	·				
Stage 1	909											
Stage 2	932						-		**** *** *** *************************	· · · · · · · · · · · · · · · · · · ·		
Otago 2			····						***************************************			
			<del></del>									
Approach	EB		NB	-	SB		*					
HCM Control Delay, s	9.5	-	1.3		0	حيب مداني	; 					
HCM LOS	A	-			nosio comente		بعصوب أوأوا					
										- 10 A		
Minor Lane/Major Mvmt		NBL	NBT E	BLn1	SBT	SBR	Value V.					
Capacity (veh/h)		1459	-	815							والمرابع والمرابع والمنطق المرابع والمنطق والمرابع والمنطق والمرابع	.
HCM Lane V/C Ratio		0.01	-	0.026	-	-						
HCM Control Delay (s)		7.5	0	9.5	-							- 1
HCM Lane LOS		Α	Α	Α	_	-				The state of the s		
HCM 95th %tile Q(veh)		0		0.1								

								-			
Intersection			<del>- v = 20- w-</del>					8.1	<del></del>		
Int Delay, s/veh	1.8					•					
Movement	EBT	EBR	WBL	WBT	NBL	NBR					
Lane Configurations	1>			4	N/						
Traffic Vol, veh/h	201	65	. 16	167	54	10	4	* .		-	
Future Vol, veh/h	201	65	16	167	54	10			the matter of the state of the		
Conflicting Peds, #/hr	0	0	Ō	0	0	0	***************************************	* a * * * * * * * * * * * * * * * * * *			. 1
A THE PARTY OF THE	Free	Free	Free	Free	Stop	Stop	- Marie Control of the Control of th	<del>*                                    </del>		e televisione approved a minima and insurant approved to the section and an extension of the section and the s	
RT Channelized		None	-	None.		None		· · · · · · · · · · · · · · · · · · ·		· ·	
Storage Length	-	_	-	_	0	-		all the said of th		- Parli (Marie - Milyania Milalia) - Miryalia (mary Pratin Papa	
Veh in Median Storage;	# 0		-	0	0						أنسب
Grade, %	0		-	Ō	0				maa diilada ah dagaan dan ayaan dagaan ah ayaa iyida qaligan soo ayaan ah ayaan ah ayaan ah	mar miliotti suutei situi maasii mittiin tiinistiinetti	
Peak Hour Factor	85	85	85	85	85	85		A AND AND ASSESSMENT OF THE PARTY OF THE PAR		V 2	
Heavy Vehicles, %	2	1	1	2	1	1	**************************************	**************************************	entario en		
Mvmt Flow	236	76	19	196	64	12			ii.		i
							***************************************			. Marinett villetjeren Marijet zur zeren ung gezigten gerenen	
Major/Minor Major/Minor	ajor1	***** <b>\</b>	/lajor2	. N	/linor1	<del></del>		**************************************	TE SCHOOL AND STORY COLUMN TO VEHICLE AND	Make with a supplementary was the promisely as the supplementary of the	
Conflicting Flow All	0	0	312	0	508	274	4 3 14 14 1				
Stage 1			- 012		274		PROGRAM - P 16	and the second s			
Stage 2					234			والأرباب سيومون بالد المتأثثات المتأثث المالية المالية المالية			لــــا
Critical Hdwy			4.11		6.41	6.21				<del></del>	<del></del> 7
Critical Hdwy Stg 1				-	5.41	0.21			and a state of the second		لنــــا
Critical Hdwy Stg 2					5.41			-			
Follow-up Hdwy			2.209		3.509	3 300		managa na			أننس
Pot Cap-1 Maneuver	 		1254	-	526	767					
Stage 1		_	-		774		***********			-	
Stage 2					807	<b>.</b> .				11.3	
Platoon blocked, %						~		· · · · · · · · · · · · · · · · · · ·		and a superior of the superior	
Mov Cap-1 Maneuver			1254	. =	517	767					
Mov Cap-2 Maneuver		_	- 1201	-	517	- ! ' ! -		tini di Kalenda da kanan da mada mada mada mada mada mada ma	6-3 		أحنحم
Stage 1					.774		<del></del>				
Stage 2		<del> </del>			793	_	** ** ********************************		<del></del>		
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			5 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		and the second s	i
Approach	EB		WB		NB						
HCM Control Delay, s	0		0.7		12.7			-			
HCM LOS									er denni et entretariore en resolución desendo nota especiales de la constante de la constante de la constante	Mr. of the second management from second and	
TIONIEOO					В						
Minor Lane/Major Mvmt		IBLn1	EBT	EBR		WBT					
Capacity (veh/h)		545		_	1254					***	
HCM Lane V/C Ratio		0.138	-		0.015	-					
HCM Control Delay (s)		12.7	_	2 3	7.9	0		*,		411	
HCM Lane LOS		В	-	_	Α	A	P. alogol Space (Space Space (Space (				
HCM 95th %tile Q(veh)		0.5			0				***************************************		

Intersection	<del> </del>										-
Int Delay, s/veh	2.1										
Movement	EBL	EBT	WBT	WBR SBL	SBR		<del></del>				
Lane Configurations		र्स	<b>1</b>	75	7						
Traffic Vol, veh/h	31	180	142	16 23	41						
Future Vol, veh/h	31	180	142	16 23	41					or was the same of	
Conflicting Peds, #/hr	0	0		0 0					2 1 1		
Sign Control	Free	Free	Free	Free Stop	Stop		un producedo apos se	and the same of th	the Control of the Co		
RT Channelized		None		None -	None			:	, <u>}</u>		
Storage Length		_		- 0	25						
Veh in Median Storage	# -	0	0	- 0						*1: 4	
Grade, %	::::::::::::::::::::::::::::::::::::::	0	0	- 0	_					**************************************	
Peak Hour Factor	85	85	85	85 85	85			-	— was summing the summary than the summary that the summary than the summary that the summa		
Heavy Vehicles, %	1	2	2	1 1	<u></u> 1			······································			
Mvmt Flow	36	212	167	19 27	48						<sub>]</sub>
man come man a management gran,									AND		
	************	wan spinish	<del></del>			Ter houselike army systems were	~				
	Major1	· · · N	lajor2	Minor2			·	***	\$1.25 <u>2.25</u>		1
Conflicting Flow All	186	0		0 461	177						
Stage 1			_	- 177	_						
Stage 2	-	-	-	- 284	-						
Critical Hdwy	4.11		_	- 6.41	6.21					7	
Critical Hdwy Stg 1	-	-	-	- 5.41	-				A STATE OF THE PROPERTY OF THE	and the contract of the contra	
Critical Hdwy Stg 2	_	_		- 5.41	-		- 4,	<del></del>			
Follow-up Hdwy	2.209	-	-	- 3.509	3.309						
Pot Cap-1 Maneuver	1395	7 <u>-</u>	-	- 560	869	1.	<del>- ,,, , , , , , , , , , , , , , , , , ,</del>	-			
Stage 1	-	-	-	- 856		M. M. M. L. L. L. M.		*****************			
Stage 2			-	- 766	-		,		***************************************	***************************************	
Platoon blocked, %		_	_	-		A STATE OF THE PARTY OF THE PAR				**************************************	
Mov Cap-1 Maneuver	1395	_		- 544	869						
Mov Cap-2 Maneuver	-	-	-	- 544	_						
Stage 1			-	- 831		****	<del></del>				
Stage 2	_	_	_	- 766	-		THE PERSON NAMED IN COLUMN TWO	**************************************		The second control con	
		* 7						· · · · · · · · · · · · · · · · · · ·			
Approach	ĒΒ		WB	SB							
					<del></del>	<del> </del>					
HCM Control Delay, s	1,1		0	10.3			المرسوب سيسان موسوب	·	_ `-	C	!
HCM LOS				B				-	alanguria sering matik barant barantan		
	·····								-		
Minor Lane/Major Mvm	it	EBL	EBT	WBT WBR	SBLn1 S	BLn2					
Capacity (veh/h)	Bergel ARE money (Per grant	1395			544	869			79	<del>,</del>	
HCM Lane V/C Ratio		0.026	_			0.056		·			**************************************
HCM Control Delay (s)		7.7	0		12					L Ng.	
HCM Lane LOS	<del></del>	Α	Ā	<del></del>	<u>.=</u> B	Α				A CONTRACTOR OF THE PARTY OF TH	
HCM 95th %tile Q(veh)		0.1			0.2	0,2	·	4	1		
					:=						

Intersection			J		<del></del>					
Int Delay, s/veh	2.8									
Movement	EBL	EBR	NBL	NBT SBT	SBR					
Lane Configurations	N/			<b>4                                    </b>	1					
Traffic Vol, veh/h	31	11	2	45 53	3	) je			<u> </u>	
Future Vol, veh/h	31	11	2	45 53	3					
Conflicting Peds, #/hr	0 -	. 0	0	0 0	0	- Free Career				
Sign Control	Stop	Stop	Free	Free Free	Free					
RT Channelized	_	None		None -	None					
Storage Length	0	_	-							
Veh in Median Storage,		_		. 0 0					and the same	
Grade, %	0	_	-	0 0						
Peak Hour Factor	85	85	85	85 85			4			أحسا
Heavy Vehicles, %	0	0	0	1 1	-					
Mvmt Flow	36	13	2	53 62	4	* *				
Major/Minor M	linor2		Major1	Major2	***********				14	7
Conflicting Flow All	121	64	66	0 -	0		<u> </u>			
Stage 1	64	-		<u></u>	<u>-</u>	<del></del>				·
Stage 2	57	<del></del>	_		-	·	arramatings, these processes, inches, many c			
Critical Hdwy	6.4	6.2	4.1						1	7
Critical Hdwy Stg 1	5.4	_	_		-		er v renderskal er der er men er en render en skal en	والمستوان	The continuous and the state of the continuous sections of the continuous sections of the state	
Critical Hdwy Stg 2	5.4	-						·	· · · · · · · · · · · · · · · · · · ·	
Follow-up Hdwy	3.5	3.3	2.2		-			the transfer they is a start thank in a real of	رمان رسامت بودرست ريوميونون واريونوس بالمتحد بالفاد المقابلة	nen cert
Pot Cap-1 Maneuver	879	1006	1549		-		7 . 7		And were made to the second se	
Stage 1	964	-	_		-			The state of the s		-
Stage 2	971			-3 -		1977		X		
Platoon blocked, %					-					
Mov Cap-1 Maneuver	878	1006	1549		_					
Mov Cap-2 Maneuver	878	-	-		_		1			
Stage 1	963	_	~					-		
Stage 2	971	_	-		-					
							13			
Approach	EB		NB	SB				2 1 3 3		-
HCM Control Delay, s	9.2		0.3	0						_
HCM LOS	Α	re. Orași are în reșe așe	620 a 6			المستراه المستراه المستراه المستراه المستراه المستراه المستراء المستراه المستراه المستراء الم	شمسة پنجلسيون منكسك الهدييناليفانده به يعقدونا للمانيات	and the second section of the second	n and the second	
		***************************************		1.885				*		
Minor Lane/Major Mvmt		NBL	NBT E	BLn1 SBT	SBR					
Capacity (veh/h)		1549		908 -	-		1			
HCM Lane V/C Ratio		0.002	_	0.054 -	_	***********************	*** **** **** ** *********************	kkaladeriisi da dibir ilgi, agaajagg agaara gaga ja aaya	article and the Transition Brains of the Land Science Community of the Com	to come and
HCM Control Delay (s)		7.3		9.2 -	-				***************************************	
HCM Lane LOS		Α	Α	Α -		***************************************	THE PERSON NAMED OF THE PE		- 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 199	
HCM 95th %tile Q(veh)		0	_	0.2 -						

# APPENDIX E: HCM REPORTS - FUTURE

ntersection											
Int Delay, s/veh	4.5										
	EBT	EBR	WBL	WBT		NBR					
Lane Configurations	₽			4	¥						
Traffic Vol, veh/h	175	48	19	268	115	16		-			-
Future Vol, veh/h	175	48	19	268	115	16					
Conflicting Peds, #/hr	0	0	0	0	0	0	in in the second second	- 1			
	ree	Free	Free	Free	Stop	Stop		THE RESIDENCE OF THE PROPERTY	ayanayaya Opaniini qoqqaaadiisisii - 97miilga ji miilii iyaa-ii qaaba,qaabiiliini ayaaDiiiiiliigiDabba	gt Waar (nitron Ohengaallaria d'aagt 18a-rah). Brys della mellik an allik be hidu	- 100-110
RT Channelized		None	_	None	-	None			4 *		-,1
Storage Length	-	_	_	_	0	_			Canada Contractor Cont		
Veh in Median Storage, #	0	1 [2		0	0			-		ان الله الله الله الله الله الله الله ال	
Grade, %	0	-	-	0	0	-	manager and the second second	ir-mannin men ir diagolisti olisti. Projenjenje britale bilanja - ili maneti Proje			- a serioused
Peak Hour Factor	70	70	70	70	70	70	-	The state of the s		and the second s	
Heavy Vehicles, %	2	1	1	2	1	1	um konsta ummatanus-				
Mvmt Flow	250	69	27	383	164	23		- The state of the same of the	,		1
England September 19 and a septe		***************************************								at semen Attin. Gazarenteianadirique, ettividadile, ettivisi a <u>r al-ti</u> on	
Major/Minor Ma	jor1	- N	/lajor2		Viinor1						-1
Conflicting Flow All	0	0	319	0	722	285					
Stage 1	_	-			285					<del></del>	
Stage 2			_	-	437	<u> </u>					
Critical Hdwy		<del> </del>	4.11	<del>-</del>	6.41	6.21	, " <u>-</u>				. 1
Critical Hdwy Stg 1		-		_	5.41			nt ar karana dan nakang muanir menantahkan arin genegarana	apar carre e usarriario della ecapo descripció della escapo de la compositione della comp	uustaan meerinin eerikkoa jaraan ee estaa astaa ah uu	
Critical Hdwy Stg 2			· -		5.41	* '	***************************************				
Follow-up Hdwy	_		2.209	_	3.509	3.309	من سود در موسود المساود المساو	**************************************	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	AND THE PROPERTY WAS A VEHICLE OF THE PROPERTY	
Pot Cap-1 Maneuver			1247	<del></del>	395	756	· ·				-
Stage 1		_	_		766	-		material desire de la destructiva de la companya de	get	hang sementahan 1998-19 yang 1991-1994 yan 1994-1994 ang ang ang ang	
Stage 2	<b>-</b> .			<u>.</u> ,	653			1 1 2 p		n state	
Platoon blocked, %	_	<del></del>						- maniferance and the section of the second		Pilledi Armendelia (mindan distribuncia milasa d	
Mov Cap-1 Maneuver		· <u>-</u>	1247	'	384	756			· • • • • • • • • • • • • • • • • • • •		
Mov Cap-2 Maneuver	_	-	_	_	384	-	Amerikaan (15) (kansania da		era		
Stage 1			-		766	-	81				
Stage 2	<u>-</u>	-	_	-	635	_	The same of the sa				
Approach	EB		WB		NB		1.50 m				
HCM Control Delay, s	0		0.5		Ž1			a turn a semanan distribution and constant			
HCM LOS					С		W 00100-000	A additional - Limpholis Application of the Association for the Control of the Co	چېپورون او مىلىنى ئىلىغانى دى ئىلىنى دى ئىلىنى ئىلىنى ئىلىن	ing and and place — in the control of the control o	
fa.	_ ~~	Sync			).A.				enterenteringung om enterepreteringstate ett enterenterine 1	and the second s	
Minor Lane/Major Mvmt	Ň	NBLn1	EBT	EBR	WBL	WBT					
Capacity (veh/h)		409		en umikusa dis	1247	·	* '		er to a there are a different in the African in the		7
HCM Lane V/C Ratio		0.458	_		0.022		A District Control of the Control of	اور دو دان و الاستان المستواد و ا	<u>,</u>	<del>Marija Marija - Marija - para da kara d</del>	·
HCM Control Delay (s)	<del></del>	21		·-	8	0	200	ž			
HCM Lane LOS		C	_	-	A	Ā		re manhanemaso madeleara mem	and a second control of the second control of the second control of the second control of the second control of	anner Marielle auther existence i lecchian (lecchian (le	
HCM 95th %tile Q(veh)		2.3	-	: = ;	0.1				eringen over the street of the	and a second control of the second control of the second control of the second control of the second control o	

Intersection		E Sia						<del></del>	
Int Delay, s/veh	3.5			· -					
Movement	EBL	EBT	WBT	WBR SBL	SBR				
Lane Configurations		ની	<u></u>	ሻ	7			_	
Traffic Vol, veh/h	65	126	224	50 44	63	: .			
Future Vol, veh/h	65	126	224	50 44	63				
Conflicting Peds, #/hr	0	0	0	0 0	0	-1-3	7		
Sign Control	Free	Free	Free	Free Stop	Stop				
RT Channelized	_	None	_	None -	None	-			
Storage Length	_	-	<b>-</b>	- 0	25				
Veh in Median Storage	,# -	0	0	- 0					
Grade, %	-	0	0	- 0	-				
Peak Hour Factor	70	70	70	70 70	70			,	,
Heavy Vehicles, %	1	2	2	1 1	1				
Mvmt Flow	93	180	320	71 63	90	4			
Major/Minor	Major1		/lajor2	Minor2				- 1	
Conflicting Flow All	391	0	najorz	0 722	356	<u> </u>	<u> 19 - John Stateston</u>		
Stage 1	391			- 356	350				
Stage 2	·			- 366		· ····· • · · · · · · · · · · · · · · ·			
Critical Hdwy	4.11			- 6.41	6.21	<del></del>			
Critical Hdwy Stg 1	4.11			- 5.41	0.21				to the assertion make the substrate affinesses and make a control
Critical Hdwy Stg 2				- 5.41		<del></del>			7.5 %
Follow-up Hdwy	2.209			- 3.509		- 15			
Pot Cap-1 Maneuver	1173	·		- 395	690		······································		The second secon
Stage 1	71177		<u> </u>	- 711	030		The same of the sa		
Stage 2		132		- 704			**************************************	* *	And representation representation and an extension and an
Platoon blocked, %				- 107		***************************************			manufacture de la composition della composition
Mov Cap-1 Maneuver	1173			- 360	690				
Mov Cap-2 Maneuver	-1170	_	_	- 360		**************************************			منيوتين ويمادك أستنومنيامية تممانيات بالمطلبة
Stage 1	-	/ <b>-</b>		- 648		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			25 2 2 THE RESERVE TO
Stage 2				- 704					
I Cago 2	÷	7.5		3.3			nen er en		2 - 2
Parameter and the second						<del></del>			
Approach	EB		WB	SB				Angel	
HCM Control Delay, s	2.8	-	0	13.5			in the second se		, , , , , , , , , , , , , , , , , , ,
HCM LOS		<b>an</b> nersen y redneggy, densembe		В		·		and the second s	- Stagner han de die statistiquestigheit des Statistics with secure, and hag day, who ye
V 4	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					*			
Minor Lane/Major Mvm	f	EBL	EBT	WBT WBR					
Capacity (veh/h)		1173	_		360	690		70	
HCM Lane V/C Ratio		0.079	-		0.175	0.13			
HCM Control Delay (s)		8.3	0		17.1	11		* v = * *	
HCM Lane LOS		Α	Α		С	В			
HCM 95th %tile Q(veh)		0.3	_		0.6	0.4			

<del> </del>								<del></del>
Intersection						Sec. 3.		
Int Delay, s/veh	3.7							
Movement	EBL	EBR	NBL	NBT SBT	SBR			
Lane Configurations	¥			4 4				
Traffic Vol, veh/h	44	34	56	59 73	99		- · · ·	
Future Vol, veh/h	44	34	56	59 73	99			
Conflicting Peds, #/hr	0	.0	0	0 0	0			
Sign Control	Stop	Stop	Free	Free Free	Free			
RT Channelized	_	None	_	None -	None			
Storage Length	0	-	_		-			
Veh in Median Storage,	# 0			0 0				
Grade, %	0	-	_	0 0	_			
Peak Hour Factor	70	70.	70	70 70	70			
Heavy Vehicles, %	0	0	0	1 1	0			
Mvmt Flow	63	49	80	84 104	141			
Major/Minor N	linor2		/lajor1	Major2	*			
Conflicting Flow All	419	175	245	0 -	0	· · · · · · · · · · · · · · · · · · ·		
Stage 1	175			1. 1 2. 1				
Stage 2	244			-	- 4 - 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	The same of the sa		
Critical Hdwy	6.4	6.2	4.1					
Critical Hdwy Stg 1	5.4	_				Oliopera umpresso priesson in security and security and the security of the security and th		
Critical Hdwy Stg 2	5.4	_			- 4			Secretary of the second
Follow-up Hdwy	3.5	3.3	2.2		mar ne nazvim menge kan napelagrafiyaan an en	- Tellenbar Carraman Salahanda dan Salahanda dan Salah		
Pot Cap-1 Maneuver	595	874	1333					-
Stage 1	860		_		n nieder ner net uit der leite meiste verscheiterstelle in zu		a dan Perinter and the Contract Landscape and th	Andrew of the second se
Stage 2	801			·	- 5 a j a		* * * * * * * * * * * * * * * * * * * *	
Platoon blocked, %		Our entre und frie par (Men.			ter and the second seco	***************************************	was, and the military are a supple species	ىلىغىنىيىلىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنىيىدىنى
Mov Cap-1 Maneuver	558	874	1333				error and a many districts of the second section of the second	
Mov Cap-2 Maneuver	558	-	-		-			
Stage 1	806							
Stage 2	801	-	-		-			
Approach	EB		NB	SB				
HCM Control Delay, s	11.5	-	3.8	. 0		The management of the species of the	To be	
HCM LOS	В	edurace français cons		tere and Difficulty the paternal righty. I want to an entral			THE RESERVE OF THE PERSON NAMED IN THE PERSON	and the second s
			-					
Minor Lane/Major Mymt		NBL	NBT E	BLn1 SBT	SBR			
Capacity (veh/h)		1333	-	662 -	-		<u> </u>	
HCM Lane V/C Ratio		0.06	_	0.168 -	*	and the state of t		
HCM Control Delay (s)	-	7.9	0	11.5 -	·		* r r	
HCM Lane LOS	**************************************	A	A	В -	_	ethan till transform skamfår sint fattiga og skille hjörner og eggepte grit den til det en i den en	and the second s	and the second s
HCM 95th %tile Q(veh)		0.2	-	0.6 -	_		-	
							وسلامه المكاونة والمتحالية والمتحالة والمتحادة والمتحادة والمتحادة	

•						-							
Intersection							-	7.1.3				<del></del>	
Int Delay, s/veh	2		-										
Movement	EBT	EBR	WBL	WBT	NBL	NBR	<del></del>						
Lane Configurations	<b>1</b> >	LUIX		4	*/	TVDI,							
Traffic Vol, veh/h	241	75	19	211	63	11	***		<u> </u>				
Future Vol, veh/h	241	75	19	211	63	<del>':'-</del> -						and the contract of the contra	لسننسب
Conflicting Peds, #/hr	0	0	0	0	0		777				<del></del>		
Sign Control	Free	Free	Free	Free	Stop	Stop		-			********	and the second second second second	
RT Channelized		None	-	None		None	<del>~~~~</del>		,			<u> </u>	
Storage Length	_		_	_	0	_			<del></del>				
Veh in Median Storage,	# 0	_	-	0	0								
Grade, %	0	-		0	0	_	******			an attended to the second seco	·	and the second s	
Peak Hour Factor	85	85	85	85	85	85				*,			
Heavy Vehicles, %	2	1	1	2	1	1			and a market and the second	en American de la Contraction de la co			
Mvmt Flow	284	88	22	248	74	13	· · · · · · · · · · · · · · · · · · ·					100	
O ner ingerversyntalisation and was a remainded photostocol and an ex-		eren radios. Il red Namb Planadio		AND AND AND POSITION	4						er-rent majetaten det	**************************************	
Major/Minor M	ajor1		/lajor2	<u>-</u>	/linor1		····		δ,				
Conflicting Flow All	0	0	372			328			y	<u> </u>			
Stage 1			312	0	620 328			~~~ <del>~</del> ~~~~		· · · · · · · · · · · · · · · · · · ·			
Stage 2					<u>320</u> 292								أسأسس
			4.11	_	6.41	6.21						<del></del>	وتمثيث
Critical Hdwy Stg 1			4.11		5.41	0.21			.are-aringapolistica-barraner	and the state of t			
Critical Hdwy Stg 2	<del>-</del>			_	5.41						~~~~		
Follow-up Hdwy			2.209		3.509	3 300	123-00 Apr			*************			
Pot Cap-1 Maneuver	<u>-</u> -		1192		453	716			4. , .				
Stage 1			- 1102		732	- 110						-	
Stage 2					-760					***************************************			
Platoon blocked, %					-700					t water the second and the second and the second			
Mov Cap-1 Maneuver	·-··	-	1192		443	716		ξ.			<del> </del>	*.	. 37 4
Mov Cap-2 Maneuver					443	-	<u></u>					<del></del>	
Stage 1				<del>-</del>	732								
Stage 2		_	_	-	744	_			***************************************				أنحصص
			<del></del>				-	V # ***********************************		<del></del>		, .	
Approach	EB		WB		NB								
HCM Control Delay, s	0	arthress thereas	0.7		14.4				The second supplies to the second	· monatorio describir per persona	<del></del>		
HCM LOS			<u> </u>	-	14.4 B		-	<u> </u>			pattales * april * concerpaint.	on approximate the second	
TOWLOO	<del></del>			·-> <del></del>									
			************										
Minor Lane/Major Mvmt	<u> </u>	IBLn1	FBT	EBR		WBT:						1 4 3 4 3 6	
Capacity (veh/h)		470			1192								
HCM Lane V/C Ratio		0.185	_	-	0.019	_				والمراجعة			**************************************
HCM Control Delay (s)	· .	14.4		- 1	8.1	0			namana inaman' an' balabbahat				
HCM Lane LOS		В	-		A	A_			- produced characteristics and the	N			
HCM 95th %tile Q(veh)		0.7		-	0.1					***************************************		n Salamidi ilaasi ohoma Yaas ohaanna asa saa	- j

## 2: Delaney Rd/Delaney Road & Battle Creek Road

		-									-	
Intersection	<del></del>			****		5.47	1 17					
Int Delay, s/veh	2.8											
Movement	EBL	EBT	WBT	WBR SBL	SBR							
Lane Configurations	-	र्स	<b>₽</b>	J.	7							
Traffic Vol, veh/h	45	207	164	25 39	66							1
Future Vol, veh/h	45	207	164	25 39	66	***				~		<del></del>
Conflicting Peds, #/hr	0	0	0	0 0	0			7 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1			. 1	
Sign Control	Free	Free	Free	Free Stop	Stop		arpretanta di		<del>er nit eta inan di ur narra la colonia</del>			
RT Channelized	-	None	` <u> </u>	None -	None			_ ,		. :	K .	
Storage Length	_	-	_	- 0	25		~~~~					
Veh in Median Storage	e,# -	0	0	- Ō	_				* **		TO SERVICE CONTRACTOR OF THE SERVICE CONTRAC	
Grade, %	-	0	0	- 0	_			- Andrews Company Company Company	***************	***************************************	and the to provide the both of the desired of the second o	
Peak Hour Factor	85	85	85	85 85	85				f .	-		
Heavy Vehicles, %	1	2	2	1 1	1						and the second s	
Mvmt Flow	53	244	193	29 46	78				And the second s			
Major/Minor	Major1		Major2	Minor2			× • • • •	<del></del>				
<del></del>	222	<u>.</u>	viajuiz		200		<del></del>					
Conflicting Flow All				0 558	208		******					
Stage 1 Stage 2				- 208 - 350		<u> </u>	<u> </u>					
Critical Hdwy	4.11				6.21		······································		* - ,**********************************			
Critical Hdwy Stg 1	4.11	eu-faurmones en-		- 6.41 - 5.41	0,21		شنشد		معيان الموسود الموسود الموسود والموسود الموسود الموسود			
Critical Hdwy Stg 2												
Follow-up Hdwy	2.209	_		- 5.41 - 3.509	2 200			· · · · · · · · · · · · · · · · · · ·	-		and the second second second	
Pot Cap-1 Maneuver	1353		<del>-</del>	- 3.509 - 492	835						-	
Stage 1	1000			- 829	- 000	, h						
Stage 2				- 716	· -			<del></del>				
Platoon blocked, %												لسنسا
Mov Cap-1 Maneuver	1353°		<u> </u>	- 470	835			, s, r,				لأغنست
Mov Cap-2 Maneuver	1000	<u>-</u>		- 470	บบบ					······································		لشسست
Stage 1				- 792		<del></del>	<del></del>				· .	<del></del>
Stage 2				- 73 <u>2</u> - 716			Tre				, i	لنحصص
Otage 2		<del></del>		- 710				<del> </del>				
PROPERTY AND ADDRESS OF THE PARTY AND ADDRESS								· · · · · · · · · · · · · · · · · · ·				
Approach	EB		WB	SB	- w							
HCM Control Delay, s	1.4		0	11.2						2		
HCM LOS			August	В		h vaddarina av						
					الياد. والمياد المدارسيات							
Minor Lane/Major Mvm	ı <del>t</del>	EBL	EBT	WBT WBR	SBLn1 S	Bl n2		o elektri	7.35	<del></del>		
Capacity (veh/h)	••. ••• <del>•••</del>	1353			470	835			70A568 4		- 32 - 40 C L	
HCM Lane V/C Ratio	*********	0.039	····			0.093			***			
HCM Control Delay (s)	,	7.8	0		13.5	9.8				<del></del>		
HCM Lane LOS	· · · · · · · · · · · · · · · · · · ·	7.0 A			13.3 B	<u>ه.و                                    </u>	· · · · · · · · · · · · · · · · · · ·			, 		
HCM 95th %tile Q(veh)	<u> </u>	0.1			0.3	0.3	<del></del>			<del></del>	- 2	
	ln		~			<u> </u>					·	

		-								
Intersection										
Int Delay, s/veh	4.8		_							
Movement	EBL	EBR	NBL	·NBT	SBT	SBR				
Lane Configurations	<b>T</b>			र्स	<b>(</b>	· - <del>.</del>	-			
Traffic Vol, veh/h	76	41	17	53	64	18			* **	
Future Vol, veh/h	76	41	17	53	64	18		*		the second of the set of the second
Conflicting Peds, #/hr	0	0	0	0	0	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Sign Control	Stop	Stop	Free	Free	Free	Free			marin n vente comme que se partir de la comme	ar remanded and a second
RT Channelized		None	_	None	_	None	7.1		11 12 12	
Storage Length	0	-	-	-	-	-			The second se	
Veh in Median Storage,	# 0	_	÷.	0	0					
Grade, %	0	-	<u>-</u>	0	0	-				
Peak Hour Factor	85	85	85	85	85	85		4	. 33	7
Heavy Vehicles, %	0	0	0	1	1	0			And the second s	
Mvmt Flow	89	48	20	62	75	21			2 20,88	
Major/Minor M	linor2		/lajor1	M	ajor2					
Conflicting Flow All	188	86	96	ا <u>یا</u> 0	ajuiz	0				<u>Jerran J.</u>
Stage 1	86	- OU	معجميمين سأر	U		U .		- North Adolesia Antonia		
Stage 2	102		-							
Critical Hdwy	6.4	6.2	4.1	-	_	_				أنسنسنت
Critical Hdwy Stg 1	5.4		*********					re anno anno anno anno anno anno anno ann		
Critical Hdwy Stg 2	5.4	-	_			- 				<u> </u>
Follow-up Hdwy	3.5	3.3	2.2					in the state of th		
Pot Cap-1 Maneuver	806	978	1510		<del></del>					
Stage 1	942	310	1010					· · · · · · · · · · · · · · · · · · ·		
Stage 2	927		-	_		<u> </u>	\$ 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 2 4 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Platoon blocked, %	321						and the contract of the state o	7 C F	The second secon	أخصيا
Mov Cap-1 Maneuver	795	978	1510				4.0 i	<del>The state of the </del>		
Mov Cap-1 Maneuver	795	310	1010				<del></del>			
Stage 1	929			- 1911 <b>-</b>	<del>-</del>	-		S. S		
Stage 2	927		**************************************					S. C. P.		
Stage 2	321	-	·	<u>-</u> 1317, 5 (		-		FRG		
	•									
Approach	EB.		NB		SB.			4 .+		
HCM Control Delay, s	10		1.8	3	0			1997		
HCM LOS	В									
	· · · · · · · · · · · · · · · · · · ·							and the second s		
Minor Lane/Major Mymt		NBL.	NBT E	BLn1	SBT	SBR				
Capacity (veh/h)	- 20	1510	_	851			The second control of the second seco	The second is represented to the second seco	The second secon	
HCM Lane V/C Ratio		0.013	_	0.162	<del></del>					
HCM Control Delay (s)		7.4	0	10		**************************************	and the second of the second s		Marian managaran da sa	2,5
HCM Lane LOS	····	A	A	В		-			ran transition investor second	أستخششسس
HCM 95th %tile Q(veh)		0		0.6		* * ±	<u> </u>			
			-			. <del> </del>			and the substitute of the subs	لنستحسب

## APPENDIX F: SITE PLAN

