

# MEMORANDUM

To: Mr. Tim Crowe  
Sharp Health Care

Date: January 17, 2023

From: John Boarman, P.E.  
LLG, Engineers

LLG Ref: 3-21-3351

Subject: Transportation Analysis for the Sharp Metropolitan Medical Campus  
CUP/PDP Amendment, PTS 696413

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Linscott, Law & Greenspan Engineers (LLG) has prepared this Transportation Analysis memo for the Sharp Metropolitan Medical Campus CUP/PDP Amendment (hereafter referred to as Project) to demonstrate consistency with the Transportation conclusions of the Long Range Plan for Expansion and Improvement (LRPEI) EIR (SCH #90010436; 03/16/1995).

## Project Description

The Sharp Metropolitan Medical Campus (SMMC) Modernization Project requires a Conditional Use Permit (CUP) and Planned Development Permit (PDP) Amendment and a Summary Vacation (VAC) for upgrades to the existing SMMC, which is located on a 41-acre site at 7901 Frost Street in the City of San Diego's (City's) Serra Mesa Community Plan area. Sharp Memorial Hospital opened in 1955, a CUP was issued in 1988, and a phased modernization program was approved by the City in 2004. Additional upgrades are necessary to further modernize the facility and comply with current seismic requirements.

The proposed changes to the site would include the following:

- Demolition of existing plumbing shop.
- A six-level, 86,000-square foot (SF) expansion of the existing Mary Birch building and construction of a new waste dock. The Mary Birch expansion would occur on the eastern side of the existing Mary Birch building and would accommodate a material loading dock and materials management area, a relocated sterile processing department and laboratory, and three levels of patient care units.
- A VAC of approximately 169-SF of City Right-Of-Way.

- Construction of a new seven-level, 207,000-SF hospital tower just north of the Mary Birch expansion, replacement of the existing Rady Bridge, and demolition of the existing dietary building and service building. The new hospital tower would include a dietary department, public spaces, a conference center, an interventional level with a preoperative expansion, diagnostic imaging and intensive care unit (ICU), and four levels of patient care units. The conference center that will be provided within the hospital tower is intended to serve the Sharp Campus, employees and staff already on the Campus. The hospital tower will include diagnostic imaging and an intensive care unit. These facilities will not serve outpatients.
- Construction of a new concourse entry for the new hospital tower.
- Replacement of the 40,539 SF existing Knollwood Building with a 120,000 SF administration office building.
- Partial demolition of the existing eight-level central and south hospital towers. Both towers would be demolished down to the existing second level podium base (which would remain).

In total, the project will demolish 255,647 SF and add 495,689 SF, for a net increase of 240,042 SF. With the implementation of the above, the project will result in a decrease of 113 beds. **Table 1** shows a licensed bed matrix which shows that Sharp Memorial and Mary Birch together have 862 licensed beds currently and will have 749 beds after six project phases completed by the approximate Opening Year of 2030. It is proposed to build 179 new beds and remove 292 beds.

It should be noted that the LRDEI assumed the Knollwood site would be developed with a 166 bed convalescent hospital.

A Long-Range Plan for Expansion and Improvement (LRPEI) was prepared by Children's Hospital and Health Center, Sharp Memorial Hospital and San Diego Medical Center in 1995. Its primary focus was to identify the circulation improvements necessary to accommodate future development of the medical campus. With this CUP/PDP amendment and its implementation, the project will result in a reduction in beds and daily traffic and the development will remain within Stage 1. No Stage 2 circulation improvements will be required. The trip generation table presented later in this report shows that addition of the project would result in a decrease in daily trips and a nominal increase in AM and PM peak hour trips.

**Figure 1** shows the Project vicinity and **Figure 2** illustrates, in more detail, the site location.

TABLE 1

<b>Sharp Memorial and Mary Birch Women's and Newborn's Hospital Totals</b>				
OSHPD Facility 12364 and OSHPD Facility 15454				
Licensed Bed Matrix				
Phase	Licensed Beds			
	Acute	Intensive	Neo-natal Intensive	Total
Current	704	74	84	862
Phase 1 <sup>a</sup>	704	74	75	853
<i>Difference</i> <sup>b</sup>	0	0	(-)9	(-)9
Phase 2 a	719	58	75	852
<i>Difference</i> <sup>b</sup>	(+)15	(-)16	(-)9	(-)10
Phase 3 <sup>a, c</sup>	593	60	75	728
<i>Difference</i> <sup>b</sup>	(-)111	(-)14	(-)9	(-)134
Phase 4 - 6 <sup>d</sup>	605	60	84	749
<i>Difference</i> <sup>b</sup>	(-)99	(-)14	0	(-)113

**Footnotes:**

- a. NICU licensed bed number has been reduced by 9 because available beds have been reduced by 9.
- b. Increase (+) / decrease (-) over existing.
- c. Assumes licenses of beds in the old towers will be removed as the new tower licenses are added.
- d. Assumes Adding 9 NICU beds back into to Mary Birch. Without final license = 740.

<b>Sharp Memorial Hospital</b>					
OSHPD Facility 12364					
Licensed Bed Matrix					
Phase	Licensed Beds				
	Coronary Care	Intensive Care	General Acute	Rehab	Total
Current	24	50	552	30	656
Phase 1	24	50	552	30	656
<i>Difference<sup>a</sup></i>	0	0	0	0	0
Phase 2	24	34	552	30	640
<i>Difference<sup>a</sup></i>	0	(-)16	0	0	(-)16
Phase 3 **	24	36	426	30	516
<i>Difference<sup>a</sup></i>	0	(-)14	(-)126	0	(-)140
Phase 4 - 6	24	36	426	30	516
<i>Difference<sup>a</sup></i>	0	(-)14	(-)126	0	(-)140

**Footnotes:**

a. Difference, decrease (-) over existing.

<b>Sharp Mary Birch Women’s and Newborn’s Hospital Totals</b>				
OSHPD Facility 15454 Licensed Bed Matrix				
<i>Phase</i>	<i>Licensed Beds</i>			
	<i>NICU</i>	<i>Perinatal</i>	<i>General Acute</i>	<i>Total</i>
Current	84	72	50	206
Phase 1 *	75	72	50	197
<i>Difference<sup>a</sup></i>	<i>(-) 9</i>	<i>0</i>	<i>0</i>	<i>(-) 9</i>
Phase 2 *	75	90	47	212
<i>Difference<sup>a</sup></i>	<i>(-) 9</i>	<i>(+) 18</i>	<i>(-) 3</i>	<i>(+) 6</i>
Phase 3 *	75	90	47	212
<i>Difference<sup>a</sup></i>	<i>(-) 9</i>	<i>(+) 18</i>	<i>(-) 3</i>	<i>(+) 6</i>
Phase 4 - 6 ***	84	90	59	233
<i>Difference<sup>a</sup></i>	<i>0</i>	<i>(+)18</i>	<i>(+)9</i>	<i>(+)27</i>

**LRPEI Consistency Analysis**

An analysis was conducted to demonstrate consistency with the transportation conclusions of the LRPEI EIR.

The study area for this analysis was determined based on the automobile delay and Level of Service (LOS) reported in the intersection analysis table (*Table 4–7*) of the 1995 LRPEI traffic study report. Based on these intersection analysis results and coordination with City staff, the following intersections were deemed necessary to reanalyze as they were operating deficiently in the 1995 analyses and will serve traffic generated by the proposed Project:

1. Mesa College Drive / Health Center Drive
2. Genesee Avenue / SR 163 SB off-ramp
3. Genesee Avenue / SR 163 NB ramps / Cardinal Road
4. Genesee Avenue / Health Center Drive

**Attachment B** contains an excerpt of the intersection analysis table from the 1995 LRPEI traffic study.

#### EXISTING CONDITIONS DESCRIPTION

The following is a description of the existing roadway network in the study area.

**Mesa College Drive** is classified in the Serra Mesa Transportation Element as a Major Street. Mesa College Drive is currently constructed as a four-lane divided roadway. The posted speed limit is 30 mph. On-street parking is provided west of Ashford Street.

**Genesee Avenue** is classified in the Serra Mesa Transportation Element as a Major Street from Linda Vista Road to SR-163 and as a Collector between SR-163 to Health Center Drive. This portion of Genesee Avenue is generally constructed as a four-lane divided roadway, though the road narrows to a single through-lane in the eastbound direction between the SR-163 southbound and northbound ramp intersections. The posted speed limit is 45 mph. Class II bicycle lanes are provided west of the freeway interchange.

**Health Center Drive** is classified in the Serra Mesa Transportation Element as a Collector Street. Health Center Drive is currently constructed as a two-lane undivided roadway. The posted speed limit is 30 mph. On-street parking is provided intermittently.

**Figure 3** contains the Existing conditions diagram.

#### EXISTING TRAFFIC VOLUMES

Existing weekday AM and PM peak hour (7:00 – 9:00 AM and 4:00 – 6:00 PM) intersection counts were conducted on the following dates for each intersection:

1. Mesa College Drive / Health Center Drive – Wednesday, January 11, 2023
2. Genesee Avenue / SR 163 SB off-ramp – Thursday, July 6, 2017
3. Genesee Avenue / SR 163 NB ramps / Cardinal Road – Tuesday, June 14, 2022
4. Genesee Avenue / Health Center Drive – Tuesday, June 14, 2022

A growth rate of 1% per year was applied towards counts conducted prior to Year 2023 to represent existing conditions.

**Figure 4** contains the Existing traffic volumes.

#### Project Trip Generation

The Project proposes the development of 120,000 SF of Commercial Office space replacing the existing 40,539 SF Commercial Office (Knollwood) and 113 overall Campus Hospital beds will be removed. A total of 179 beds are proposed and 292 beds will be removed. Also, the LRPEI EIR assumed the Knollwood Building would be built as a convalescent hospital with 166 beds. Trip generation rates for all land uses were taken from the *City of San Diego Trip Generation Manual, May 2003*.

**Table 2** summarizes the Project trip generation calculations. As shown in *Table 2*, the proposed Commercial Office space is calculated to generate a total of 1,938 daily trips with 252 AM peak hour trips (227 inbound / 25 outbound) and 271 PM peak hour trips (54 inbound / 217 outbound) and the proposed 179 Hospital Beds are calculated to generate a total of 3,580 daily trips with 322 AM peak hour trips (225 inbound / 97 outbound) and 358 PM peak hour trips (107 inbound / 251 outbound). The 292 Hospital Beds to be removed are calculated to generate a total of 5,840 daily trips with 526 AM peak hour trips (368 inbound / 158 outbound) and 584 PM peak hour trips (175 inbound / 409 outbound) and the Knollwood Building to be replaced is calculated to generate a total of 498 daily trips with 25 AM peak hour trips (20 inbound / 5 outbound) and 40 PM peak hour trips (12 inbound / 28 outbound). Thus, the proposed Project is calculated to generate a net of 820 fewer daily trips with 23 AM peak hour trips (64 inbound / 41 fewer outbound) and 5 PM peak hour trips (26 fewer inbound / 31 outbound).

### **Project Trip Distribution and Assignment**

The Project traffic was distributed and assigned along Mesa College Drive and Genesee Avenue based on the site location, access to SR 163 and I-805, existing traffic patterns in the area and anticipated traffic patterns to and from the site. Based on the above, approximately 40% were assumed to be coming from the south, 20% from the north, 25% from the west and 15% from the east.

The “to be demolished” and proposed Project traffic volumes were assigned to the street system individually using these distribution percentages.

**Figure 5** shows the Project traffic distribution. **Figure 6** shows the “Project” traffic volumes generated by uses to be demolished. **Figure 7** shows the Proposed Project traffic volumes. **Figure 8** shows the net Project traffic volumes (*Figure 7* volumes minus *Figure 6* volumes).

**TABLE 2  
 TRIP GENERATION (SHARP CUP)**

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour				PM Peak Hour							
		Rate <sup>a</sup>	Volume	% of ADT <sup>b</sup>	In:Out Split <sup>a</sup>	Volume		% of ADT <sup>b</sup>	In:Out Split	Volume					
						In	Out			In	Out	Total	Total		
<b>To be Demolished</b>															
Knollwood Building <sup>b</sup>	166 Beds	3 / Bed	498	5%	80%:20%	20	5	25	8%	30%:70%	12	28	40		
Hospital Beds	292 Beds	20 / Bed	5,840	9%	70%:30%	368	158	526	10%	30%:70%	175	409	584		
<b>Total to be Demolished</b>			<b>6,338</b>			<b>388</b>	<b>163</b>	<b>551</b>			<b>187</b>	<b>437</b>	<b>624</b>		
<b>Proposed Project</b>															
Commercial Office <sup>c</sup>	120 KSF	$0.756\text{Ln}(x) + 3.95$	1,938	13%	90%:10%	227	25	252	14%	20%:80%	54	217	271		
Hospital Beds	179 Beds	20 / Bed	3,580	9%	70%:30%	225	97	322	10%	30%:70%	107	251	358		
<b>Total Proposed Project</b>			<b>5,518</b>			<b>452</b>	<b>122</b>	<b>574</b>			<b>161</b>	<b>468</b>	<b>629</b>		
<b>Net Decrease / (Increase) in trips</b>			<b>-820</b>			<b>64</b>	<b>-41</b>	<b>23</b>			<b>-26</b>	<b>31</b>	<b>5</b>		

**Footnotes:**

- a. Rates are based on *City of San Diego Trip Generation Manual, May 2003*.
- b. Demolition of Knollwood Building was approved as removal of 166 convalescent hospital beds in LRPEI EIR.
- c. Daily trips are calculated using the formula  $0.756\text{Ln}(x)+3.95$  for Commercial Office.



### Opening Year Traffic Forecast

This section presents analysis of study area intersections under Existing, Opening Year and Opening Year + Project conditions.

In assessing the Project's Opening Year scenario, it was necessary to review the cumulative projects in the area. Cumulative projects are other projects in the study area that will add traffic to the local circulation system prior to the opening day of the Project. LLG researched potential cumulative projects that should be included in the analysis. Based on the research, five (5) cumulative projects were identified to potentially add traffic within the study area and were therefore included in the Opening Year analysis.

1. **University of San Diego Master Plan Update** – This project proposes to increase student enrollment by 750 FTE (full-time equivalent) students in the near-term. The university is located on Linda Vista Road, east of Morena Boulevard. This project is calculated to generate approximately 2,550 daily trips in the near-term.
2. **Francis Parker School Master Plan Update** – This project proposes to increase student enrollment by 140 students. The school is located less than one-half mile east of the University of San Diego, south of Linda Vista Road. This project is calculated to generate approximately 476 daily trips.
3. **Kearny Mesa Juvenile Detention Center** – This project proposes the redevelopment and reorganization of the Juvenile Justice Campus, a 31.49-acre parcel, which currently includes the Kearny Mesa Juvenile Detention Facility (KMJDF), formerly the San Diego County Juvenile Hall. The Project objectives include development of a juvenile detention design and specification guidance consistent with current juvenile rehabilitation and development models, trends in juvenile arrests and detention, ages of youth offenders, nature of crimes, and effectiveness of intervention programs. Net Project Buildout is calculated to generate 161 ADT.
4. **Pediatric Mental and Behavioral Health Project** – This project includes the construction of two new patient care buildings totaling approximately 93,000 square feet (SF). These are the Outpatient Psychiatric Clinic and the Inpatient Acute Psychiatric Hospital. The Project site is located on Birmingham Way east of Meadow Lark Drive on County of San Diego-owned land within the City of San Diego, south of the Interstate (I)-805 and State Route (SR) 163 freeway interchange in the Serra Mesa Community Planning Area.
5. **Rady Beacon EIR** – This project proposes to increase the number of beds by 14 at Rady Children's Hospital. The Project site is located on 3020 Children's Way in the City of San Diego.

**Figure 9** contains the Opening Year traffic volumes. **Figure 10** contains the Opening Year + Project traffic volumes.

### **Intersection Analysis Results**

**Table 3** summarizes the intersection operations. As shown in *Table 3*, with the addition of Project and cumulative projects traffic volumes, all of the study area intersections are calculated to operate at LOS D or better.

**Attachment C** contains the Existing intersection analysis worksheets. **Attachment D** contains the Existing, Opening Year intersection analysis worksheets. **Attachment E** contains the Opening Year + Project intersection analysis worksheets.

**TABLE 3**  
**INTERSECTION OPERATIONS**

Intersection	Control Type	Peak Hour	Existing		Opening Year + Project		Opening Year + Project		A <sup>c</sup>
			Delay <sup>a</sup>	LOS <sup>b</sup>	Delay	LOS	Delay	LOS	
1. Mesa College Dr / Health Center Dr	Signal	AM	44.7	D	44.9	D	45.1	D	0.2
		PM	31.0	C	31.3	C	31.5	C	0.2
2. Genesee Ave / SR 163 SB off-ramp	Signal	AM	39.2	D	41.4	D	42.1	D	0.7
		PM	21.5	C	21.6	C	21.8	C	0.2
3. Genesee Ave / SR 163 NB ramps / Cardinal Rd	Signal	AM	36.4	D	39.6	D	42.9	D	3.3
		PM	31.5	C	33.4	C	33.9	C	0.5
4. Genesee Ave / Health Center Dr	Signal	AM	14.0	B	14.6	B	15.2	B	0.6
		PM	30.4	C	32.0	C	32.4	C	0.4

**Footnotes:**

- a. Average delay expressed in seconds per vehicle
- b. Level of Service
- c. Δ denotes an increase in delay due to Project

**SIGNALIZED**

**DELAY/LOS THRESHOLDS**

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
≥ 80.1	F

### Long Range Plan for Expansion and Improvement

The Long-Range Plan for Expansion and Improvement (LRPEI) was prepared by Children’s Hospital and Health Center, Sharp Memorial Hospital and San Diego Medical Center in 1995. **Attachment F** contains the cover page of the document.

Its primary focus was to identify the circulation improvements necessary to accommodate future developments within these three entities. **Table 4** shows the ADT Status as of January 2021. The current Sharp Memorial proposal is not included. The table shows that the overall development is within Stage 1. Since the project result is a reduction in traffic, the development will remain within Stage 1.

**TABLE 4**  
**ADT / LRPEI STATUS AS OF JANUARY 2021**

<b>Development Since 2004 (No development subject to LRPEI prior to 2004)</b>	<b>ADT Generation</b>
<b>Rady Children’s Hospital</b> (2007) - Acute Care Expansion: 84 new beds *20 ADT/bed	1,680 ADT
<b>Sharp Hospital</b> - Acute Care Expansion: 44 new beds *20 ADT/bed	880 ADT
<b>Cambridge Medical</b> - Office Buildings	5,750 ADT
<b>Rady Children’s Hospital</b> - Education and Office Building	548 ADT
<b>Sharp Mary Birch Hospital</b> - Bed Expansion: 37 beds	740 ADT
<b>Sharp Memorial Hospital ICU</b> - Bed Reduction: (9) beds	(180) ADT
<b>Sharp Memorial Rehab</b> - Bed Reduction: (10) beds	(200) ADT
<b>Sharp Mesa Vista Hospital</b> - Bed Expansion: 10 beds	200 ADT
<b>Total</b>	<b>9,418 ADT</b>
<b>Stage</b>	<b>LRPEI ADT Threshold</b>
<b>1</b>	9,946 ADT
<b>2</b>	17,017 ADT
<b>3</b>	32,275 ADT

## Conclusion

The trip generation summary shows that the Project will result in a net decrease in daily traffic as compared to what was assumed in the LRPEI EIR. The summary also shows that there will be an increase in the AM inbound and PM outbound trips. Therefore, an analysis of four (4) intersections near the Project site was conducted without and with the increase in peak hour trips. The analysis shows that LOS D or better results were calculated. No significant impacts requiring mitigation are necessary.

**Figure 1:** Vicinity Map

**Figure 2:** Project Area Map

**Figure 3:** Existing Conditions Diagram

**Figure 4:** Existing Traffic Volumes

**Figure 5:** Project Traffic Distribution

**Figure 6:** Existing Project Traffic Volumes to be Removed

**Figure 7:** Proposed Project Traffic Volumes

**Figure 8:** Net Project Traffic Volumes

**Figure 9:** Opening Year Traffic Volumes

**Figure 10:** Opening Year + Project Traffic Volumes

**Table 1:** License Bed Matrix

**Table 2:** Project Trip Generation

**Table 3:** Intersection Operations

**Table 4:** ADT / LRPEI Status as of January 2021

**Attachment A:** Intersection Manual Count Sheets and Traffic Volume Adjustments

**Attachment B:** 1995 LRPEI traffic study intersection analysis table

**Attachment C:** Peak Hour Intersection Analysis Worksheets – Existing

**Attachment D:** Peak Hour Intersection Analysis Worksheets – Opening Year

**Attachment E:** Peak Hour Intersection Analysis Worksheets – Opening Year + Project

**Attachment F:** Long Range Plan for Expansion and Improvement Cover Page

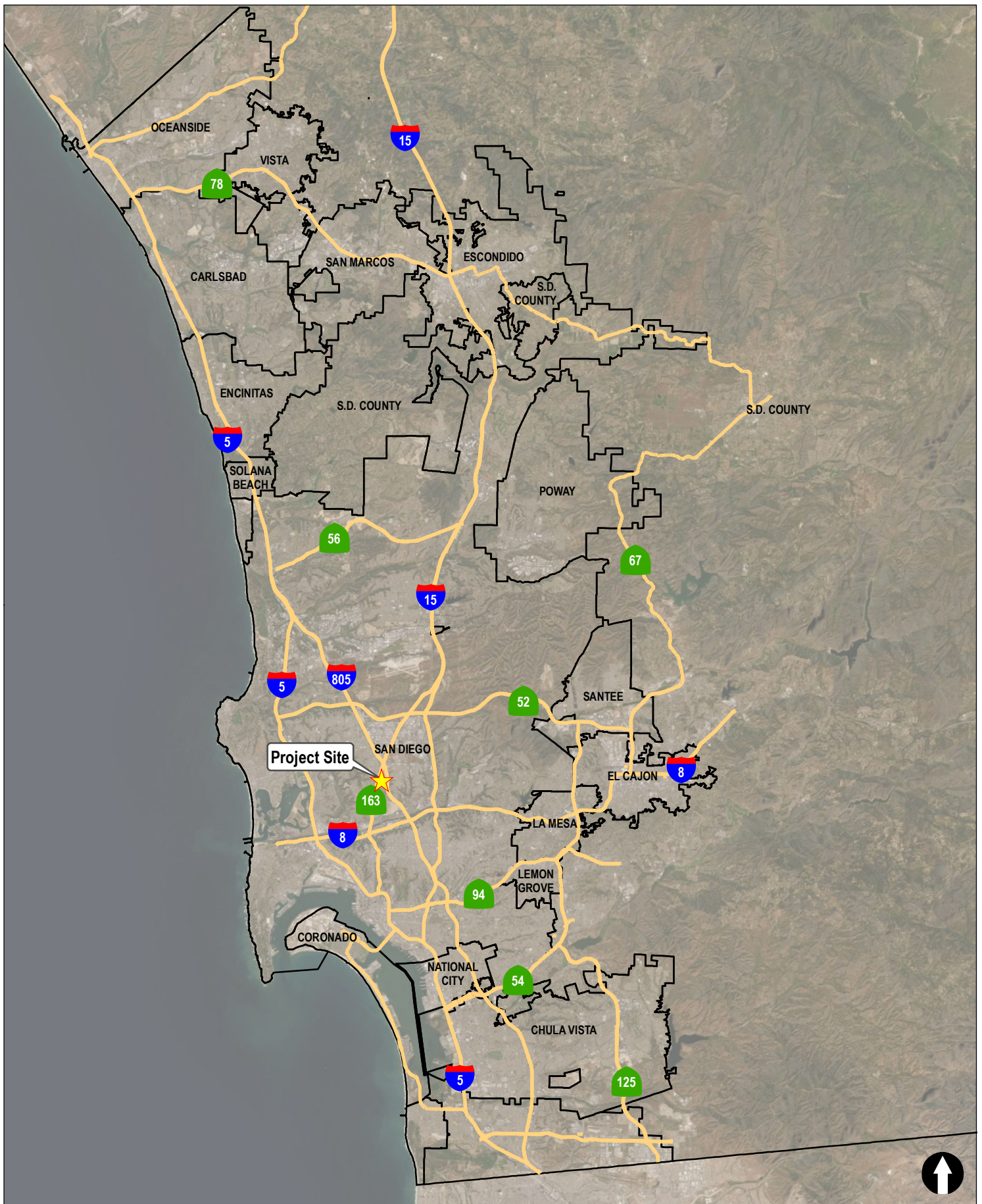
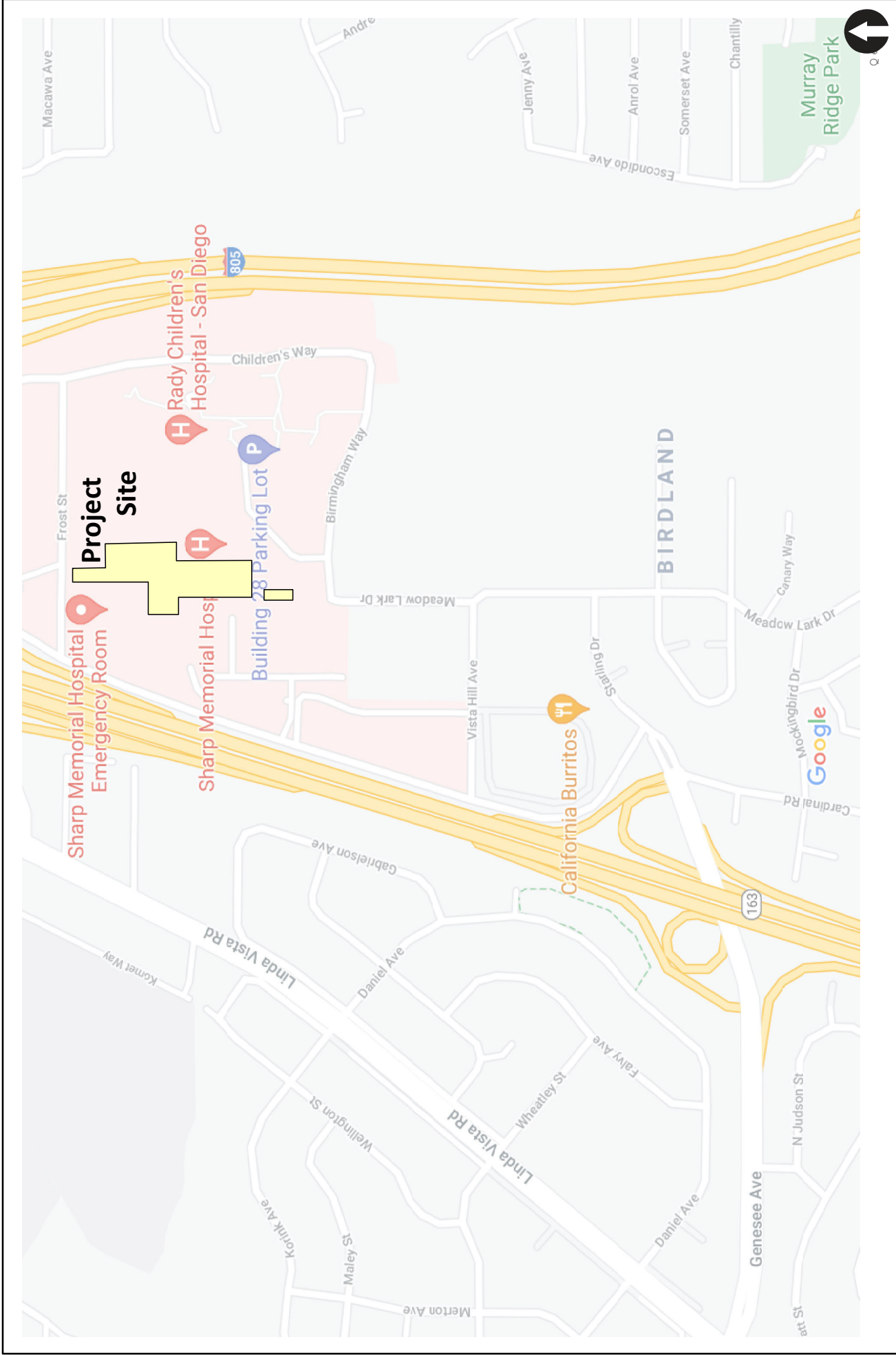


Figure 1  
**Vicinity Map**



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Figure 2

# Project Area Map

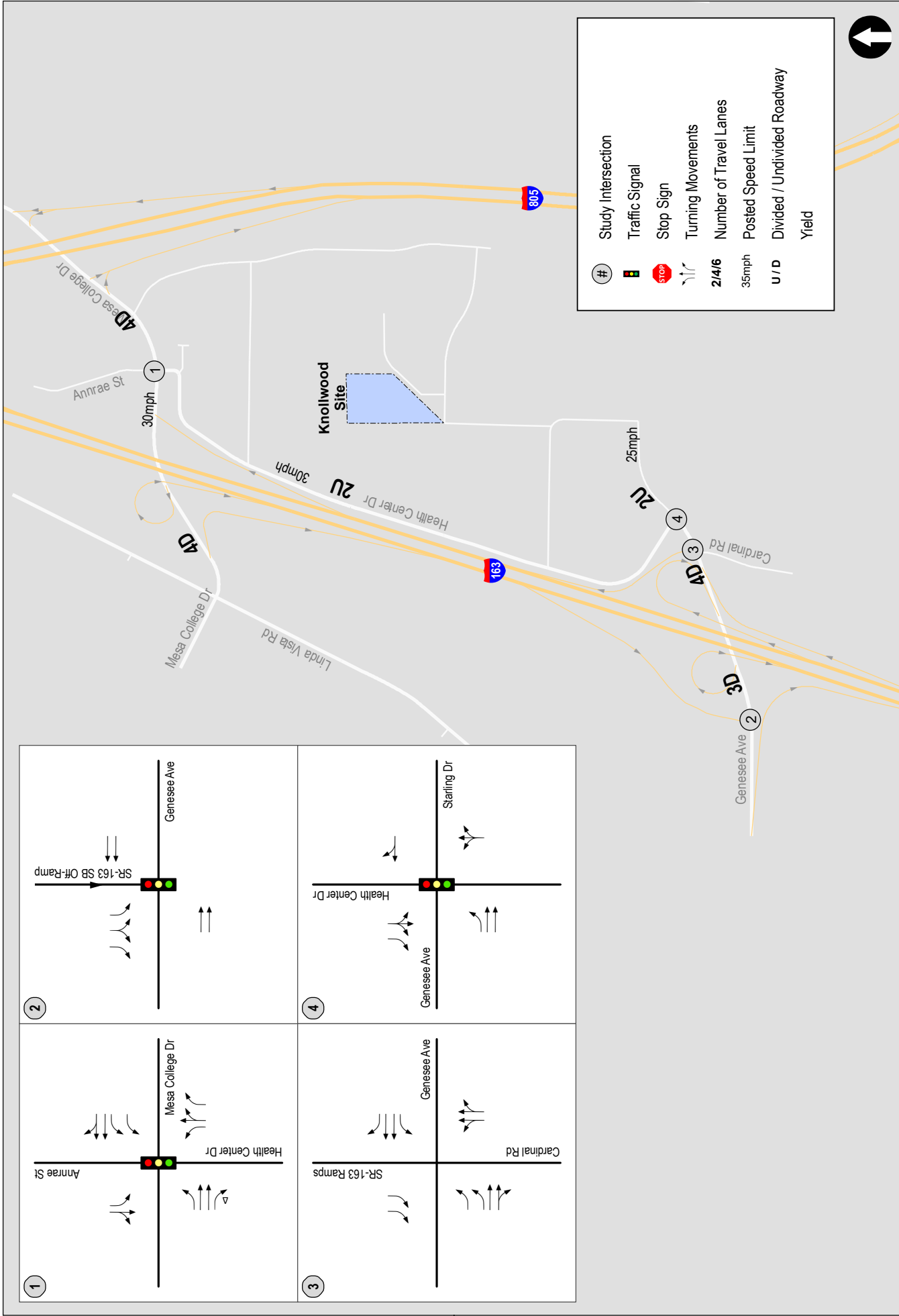


Figure 3  
Existing Conditions Diagram

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Time: 11:42 AM





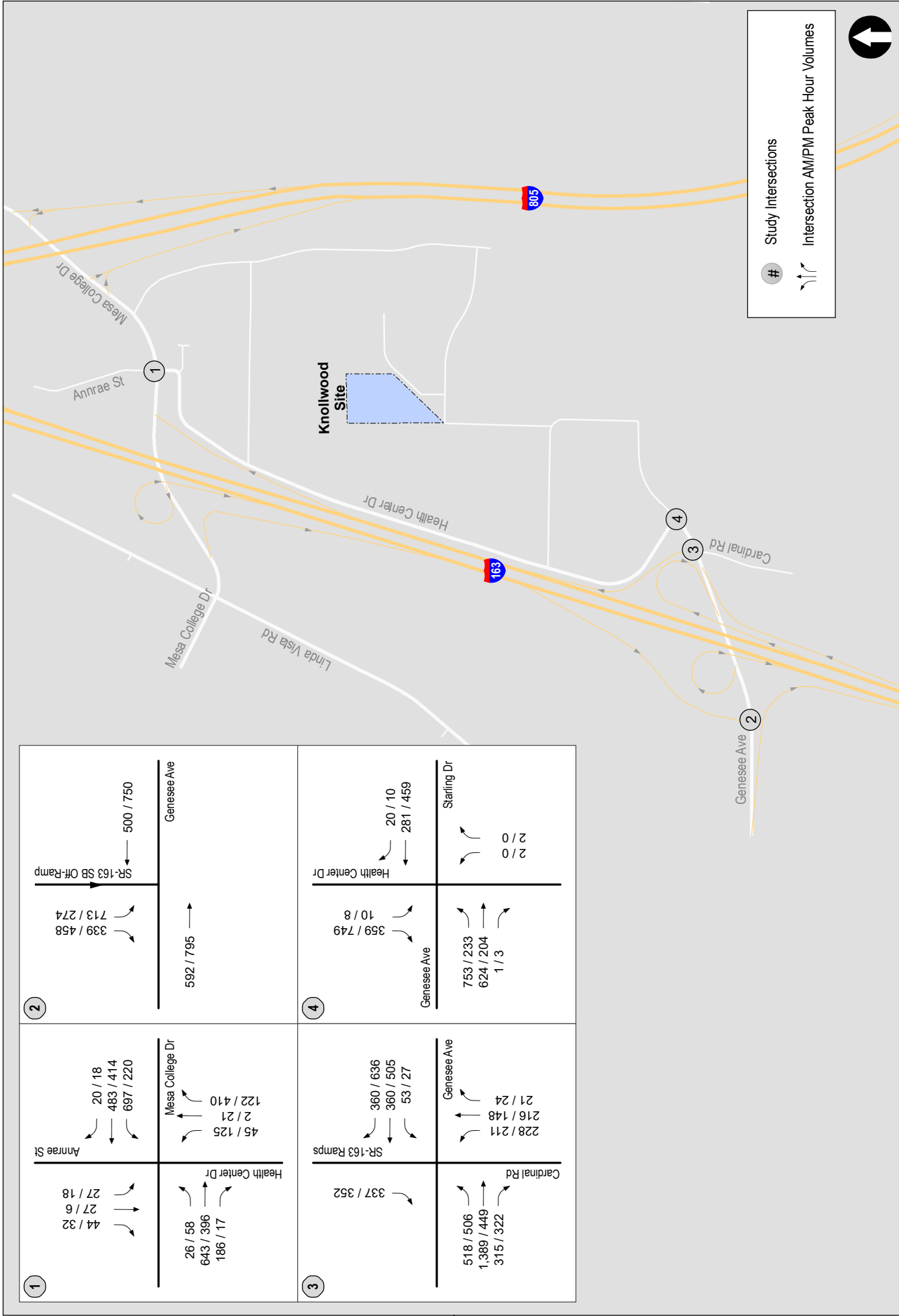


Figure 4  
Existing Traffic Volumes

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Time: 11:38 AM



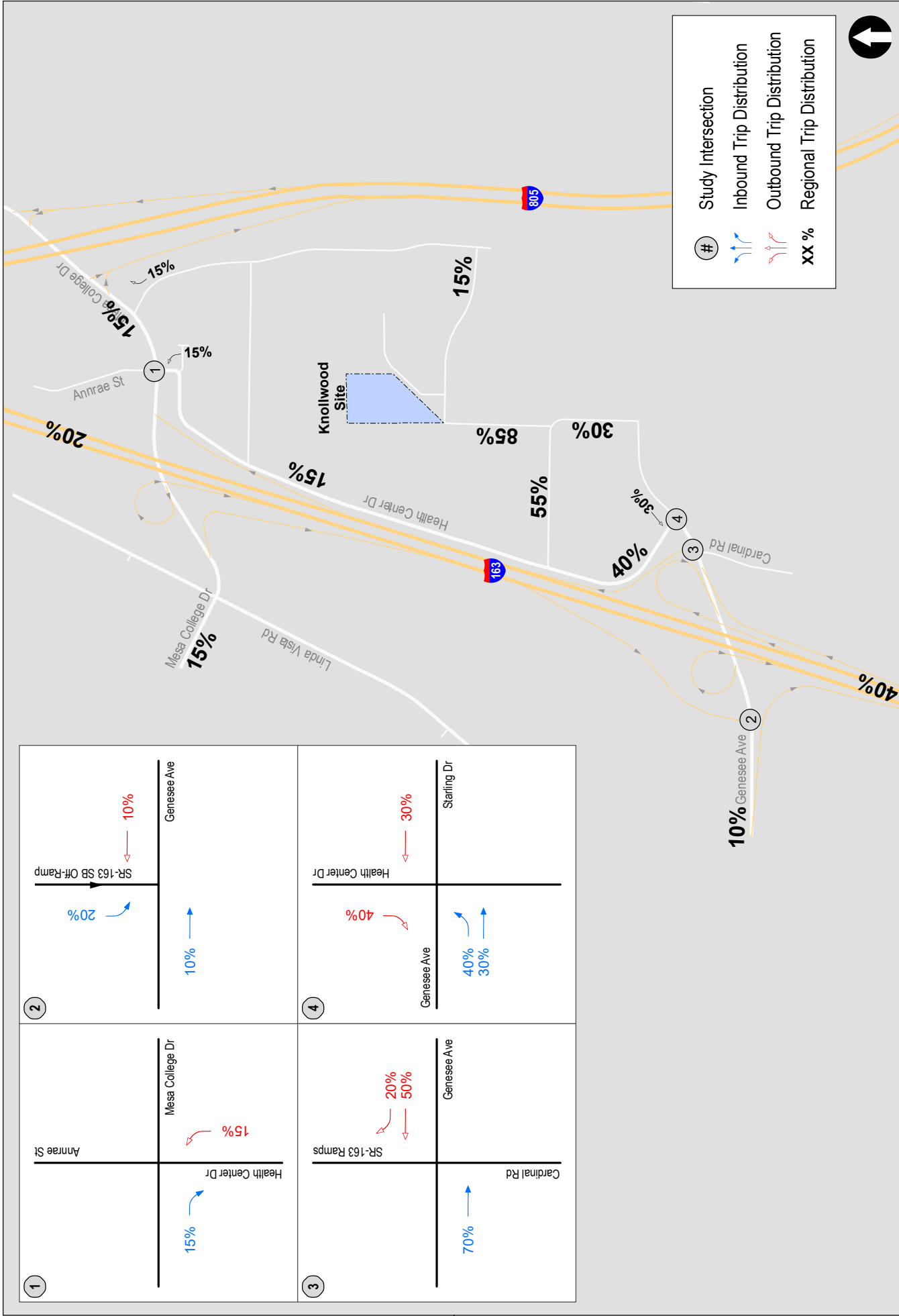
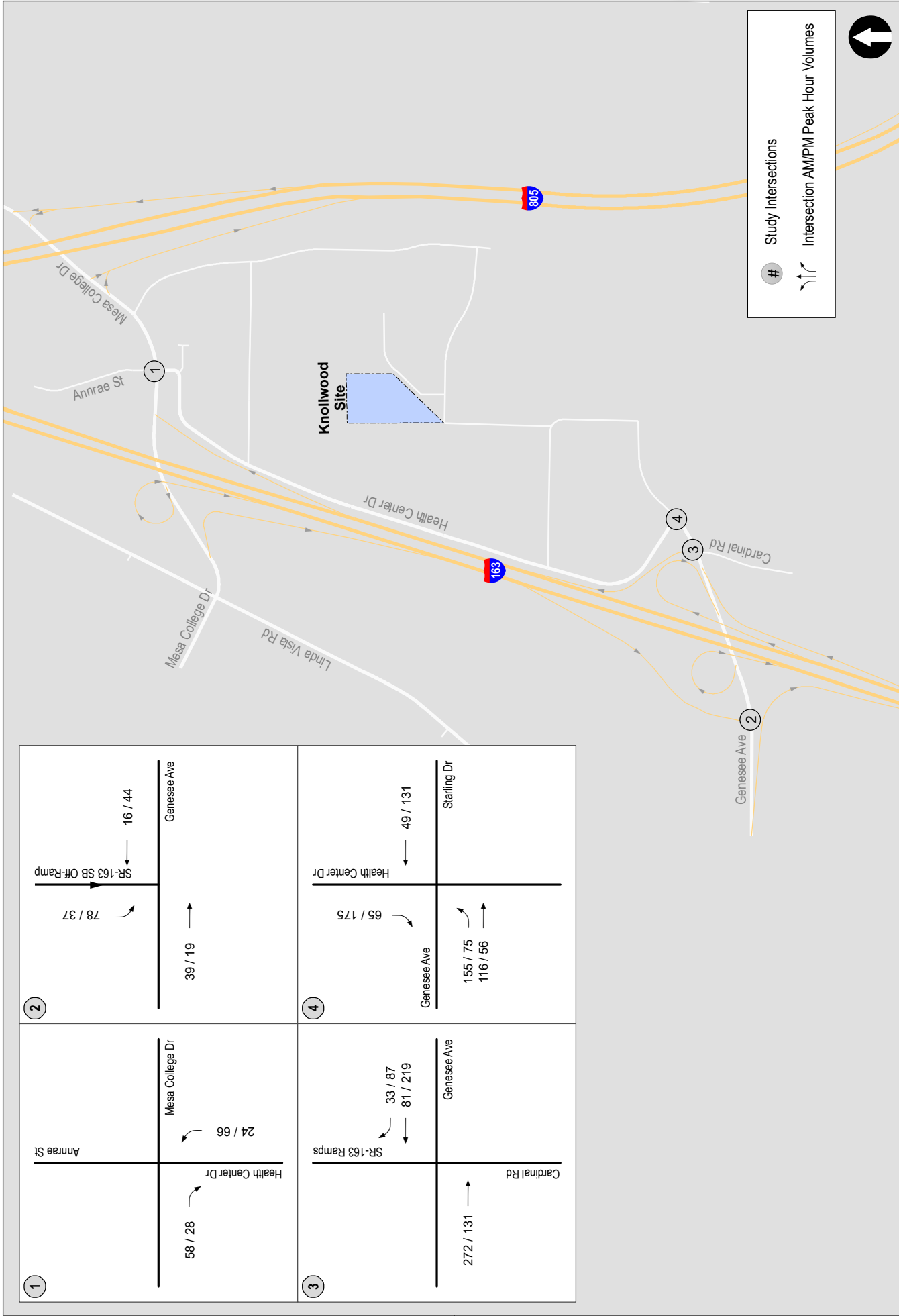


Figure 5  
**Project Traffic Distribution**

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 Time: 11:39 AM



Figure 6  
**Existing Project: Traffic volumes to be removed**

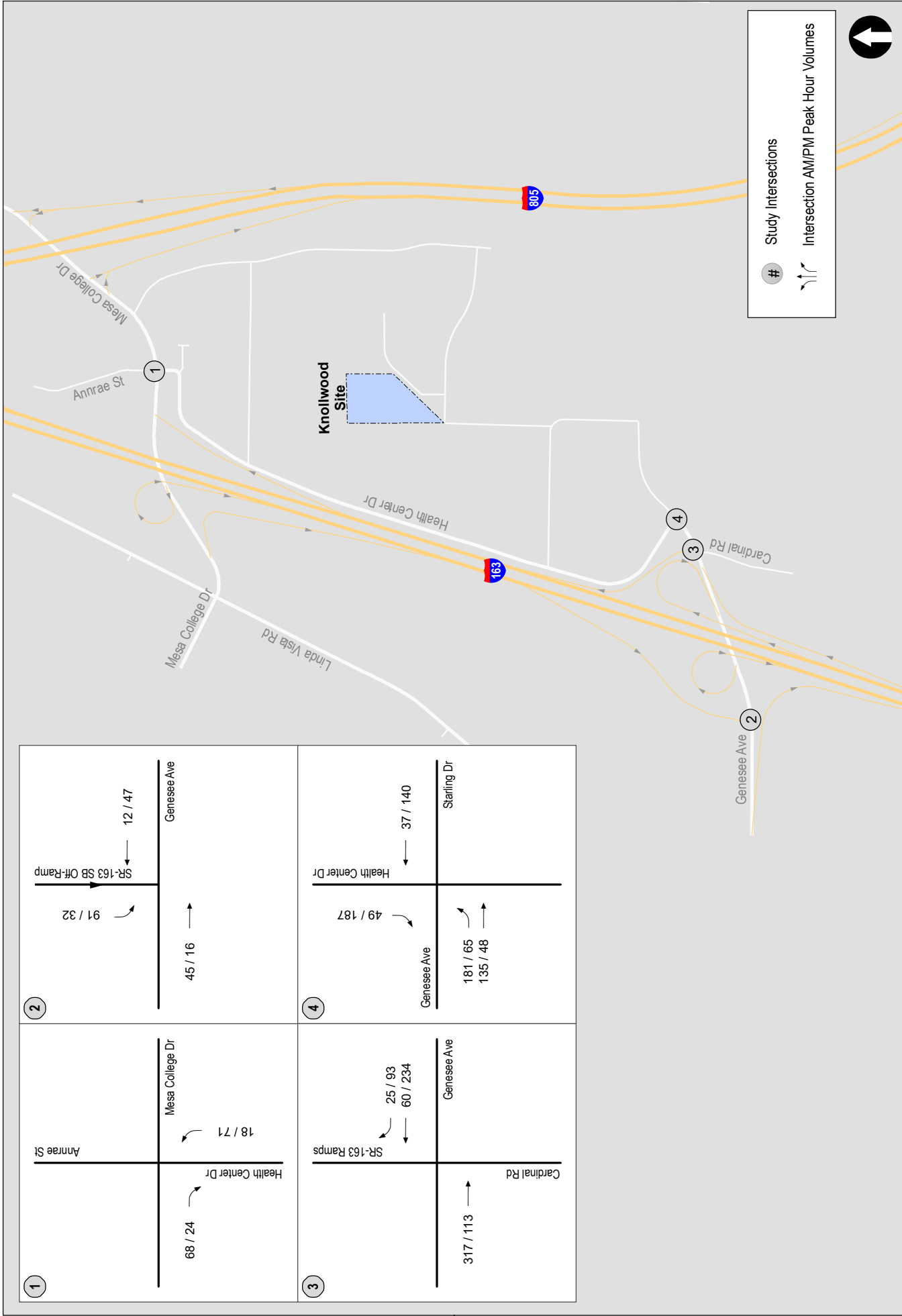
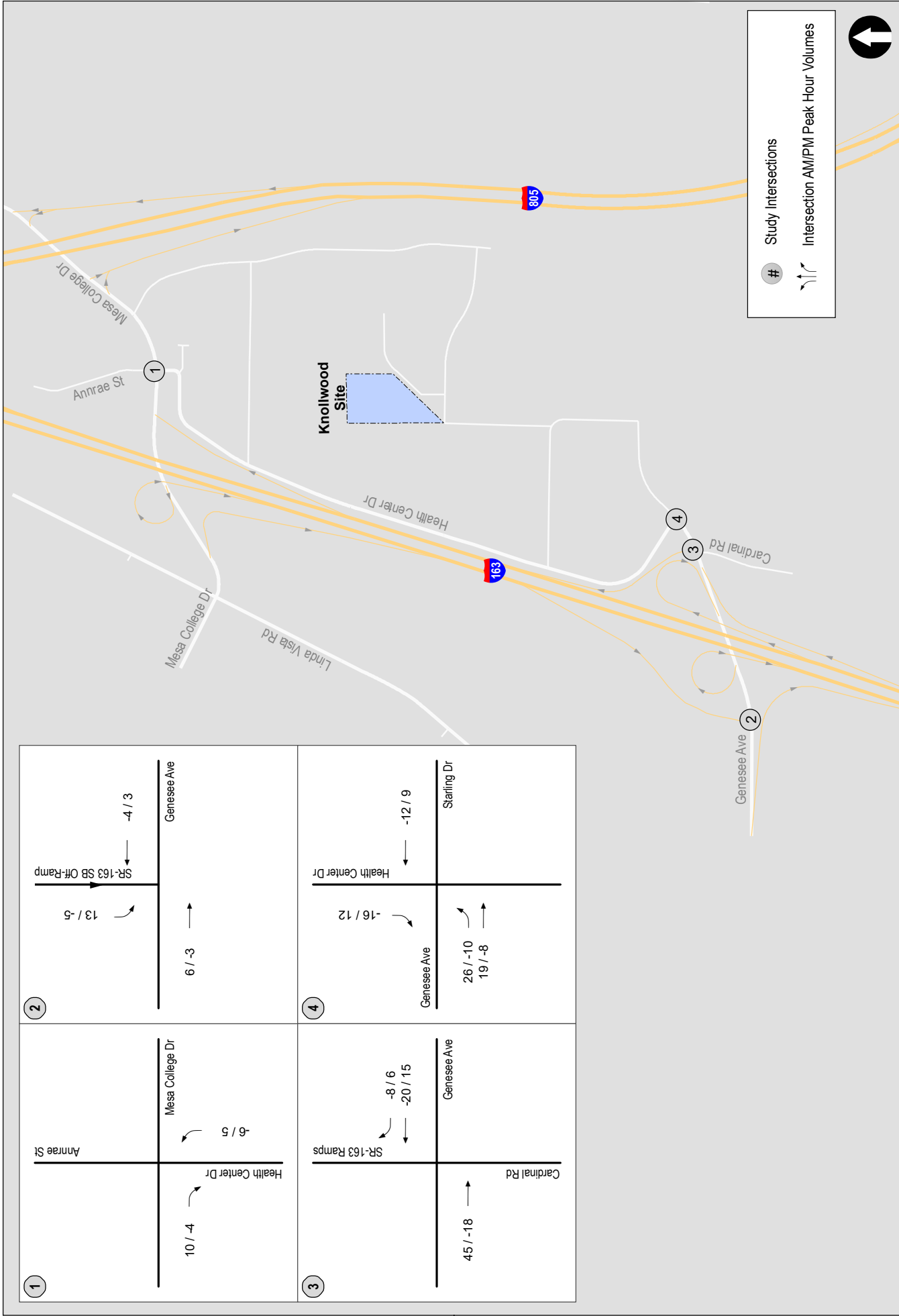


Figure 7  
**Proposed Project Traffic Volumes**

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Figure 8  
**Net Project Traffic Volumes**

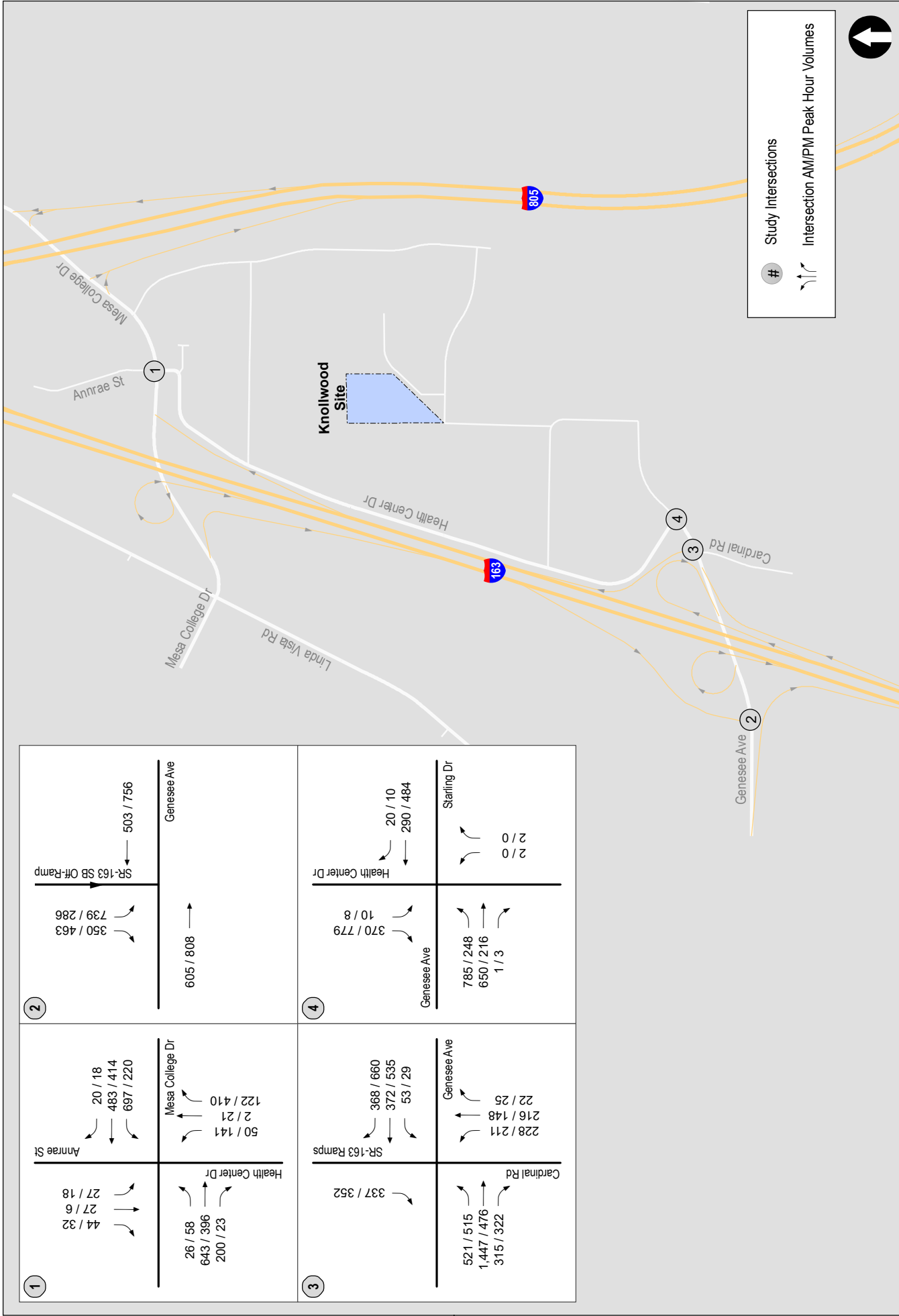


Figure 9  
**Opening Year Traffic Volumes**

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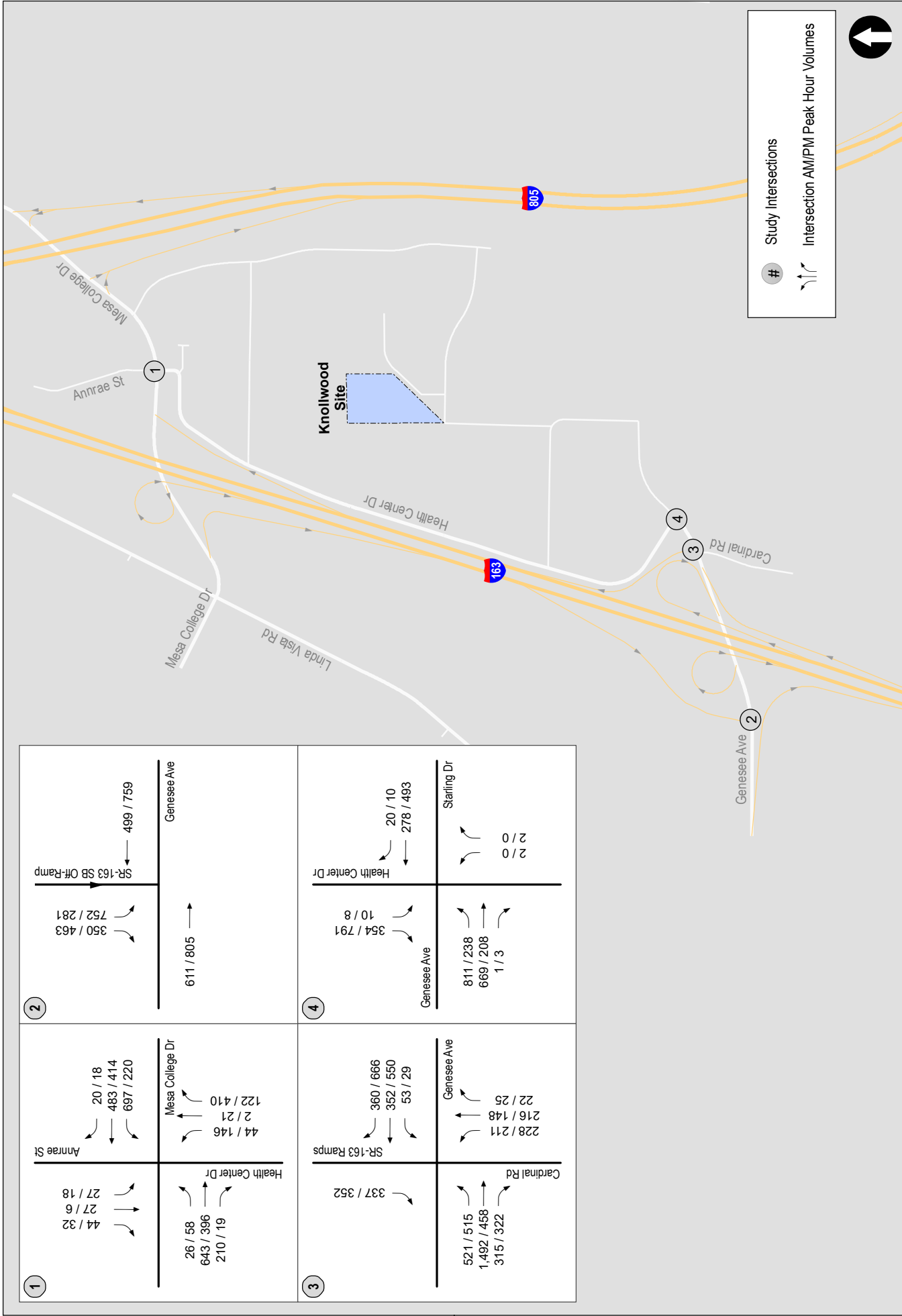


Figure 10  
**Opening Year + Project Traffic Volumes**

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**ATTACHMENT A**  
**INTERSECTION MANUAL COUNT SHEETS AND TRAFFIC  
VOLUME ADJUSTMENTS**



City of San Diego  
 N/S: Annrae Street/Health Center Drive  
 E/W: Mesa College Drive  
 Weather: Clear

File Name : 01\_SDG\_Ann\_MC AM  
 Site Code : 05723035  
 Start Date : 1/11/2023  
 Page No : 1

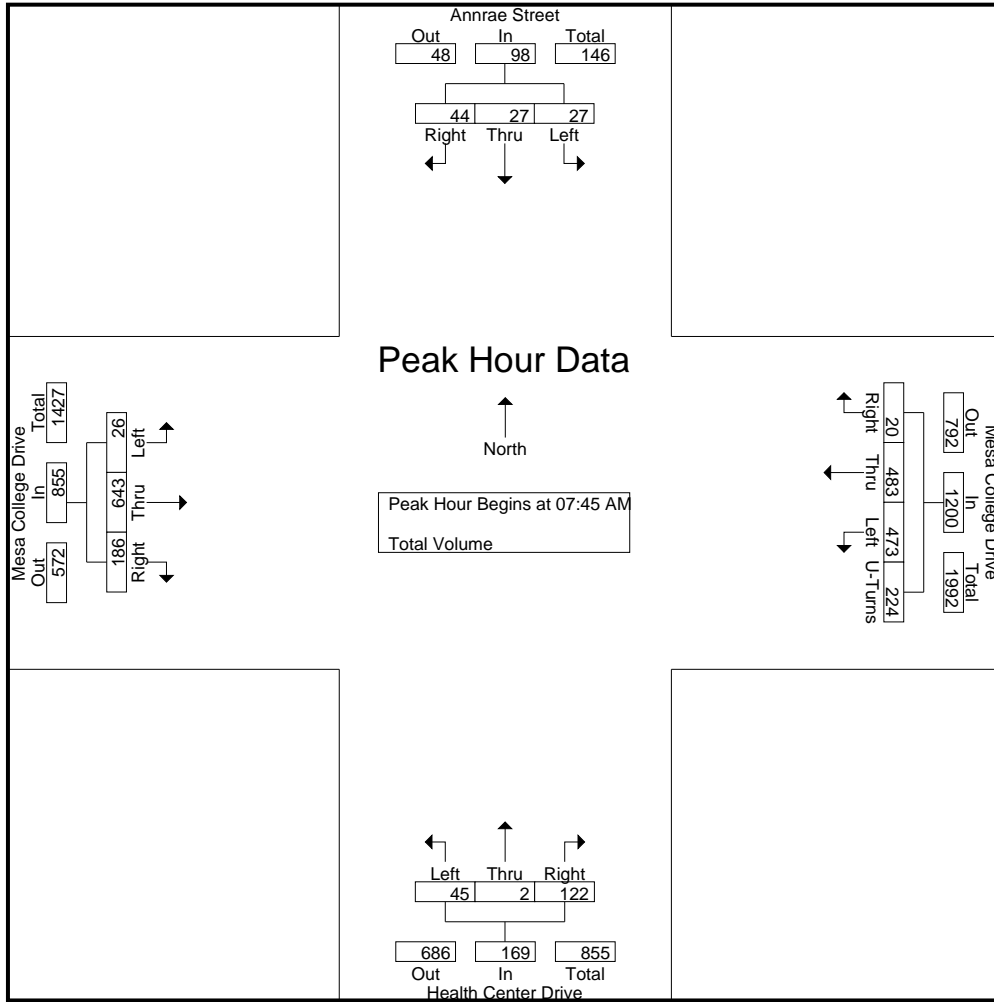
Groups Printed- Total Volume

Start Time	Annrae Street Southbound				Mesa College Drive Westbound					Health Center Drive Northbound				Mesa College Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	8	2	8	18	95	70	2	66	233	7	0	22	29	3	105	38	146	426
07:15 AM	5	4	11	20	94	70	0	55	219	8	1	28	37	8	107	39	154	430
07:30 AM	4	4	14	22	96	91	3	42	232	12	1	57	70	2	147	30	179	503
07:45 AM	7	6	18	31	93	84	4	69	250	13	1	50	64	8	165	36	209	554
Total	24	16	51	91	378	315	9	232	934	40	3	157	200	21	524	143	688	1913
08:00 AM	4	6	6	16	138	129	4	57	328	9	1	23	33	5	143	64	212	589
08:15 AM	8	9	8	25	119	137	7	49	312	14	0	23	37	4	161	54	219	593
08:30 AM	8	6	12	26	123	133	5	49	310	9	0	26	35	9	174	32	215	586
08:45 AM	8	3	9	20	107	112	3	52	274	12	1	35	48	6	142	46	194	536
Total	28	24	35	87	487	511	19	207	1224	44	2	107	153	24	620	196	840	2304
Grand Total	52	40	86	178	865	826	28	439	2158	84	5	264	353	45	1144	339	1528	4217
Apprch %	29.2	22.5	48.3		40.1	38.3	1.3	20.3		23.8	1.4	74.8		2.9	74.9	22.2		
Total %	1.2	0.9	2	4.2	20.5	19.6	0.7	10.4	51.2	2	0.1	6.3	8.4	1.1	27.1	8	36.2	

Start Time	Annrae Street Southbound				Mesa College Drive Westbound					Health Center Drive Northbound				Mesa College Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:45 AM																		
07:45 AM	7	6	<b>18</b>	<b>31</b>	93	84	4	<b>69</b>	250	13	<b>1</b>	<b>50</b>	<b>64</b>	8	165	36	209	554
08:00 AM	4	6	6	16	<b>138</b>	129	4	57	<b>328</b>	9	1	23	33	5	143	<b>64</b>	212	589
08:15 AM	<b>8</b>	<b>9</b>	8	25	119	<b>137</b>	<b>7</b>	49	312	<b>14</b>	0	23	37	4	161	54	<b>219</b>	<b>593</b>
08:30 AM	8	6	12	26	123	133	5	49	310	9	0	26	35	<b>9</b>	<b>174</b>	32	215	586
Total Volume	27	27	44	98	473	483	20	224	1200	45	2	122	169	26	643	186	855	2322
% App. Total	27.6	27.6	44.9		39.4	40.2	1.7	18.7		26.6	1.2	72.2		3	75.2	21.8		
PHF	.844	.750	.611	.790	.857	.881	.714	.812	.915	.804	.500	.610	.660	.722	.924	.727	.976	.979

City of San Diego  
 N/S: Annrae Street/Health Center Drive  
 E/W: Mesa College Drive  
 Weather: Clear

File Name : 01\_SDG\_Ann\_MC AM  
 Site Code : 05723035  
 Start Date : 1/11/2023  
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:15 AM				07:45 AM				
+0 mins.	7	6	18	31	138	129	4	57	328	8	1	28	37	8	165	36	209
+15 mins.	4	6	6	16	119	137	7	49	312	12	1	57	70	5	143	64	212
+30 mins.	8	9	8	25	123	133	5	49	310	13	1	50	64	4	161	54	219
+45 mins.	8	6	12	26	107	112	3	52	274	9	1	23	33	9	174	32	215
Total Volume	27	27	44	98	487	511	19	207	1224	42	4	158	204	26	643	186	855
% App. Total	27.6	27.6	44.9		39.8	41.7	1.6	16.9		20.6	2	77.5		3	75.2	21.8	
PHF	.844	.750	.611	.790	.882	.932	.679	.908	.933	.808	1.000	.693	.729	.722	.924	.727	.976

City of San Diego  
 N/S: Annrae Street/Health Center Drive  
 E/W: Mesa College Drive  
 Weather: Clear

File Name : 01\_SDG\_Ann\_MC PM  
 Site Code : 05723035  
 Start Date : 1/11/2023  
 Page No : 1

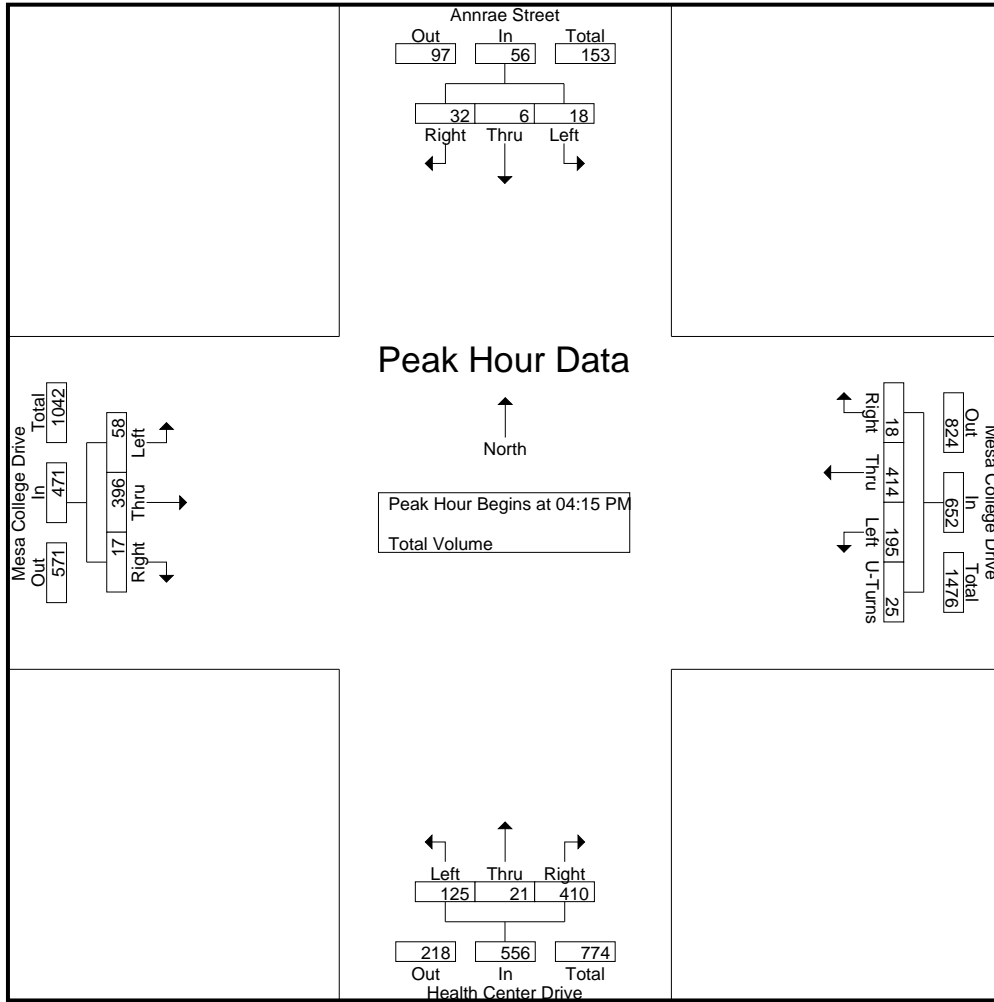
Groups Printed- Total Volume

Start Time	Annrae Street Southbound				Mesa College Drive Westbound					Health Center Drive Northbound				Mesa College Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	2	11	15	28	97	5	8	138	29	4	85	118	19	104	8	131	402
04:15 PM	4	1	8	13	61	116	6	10	193	34	4	82	120	14	90	4	108	434
04:30 PM	7	2	9	18	38	95	1	4	138	41	4	107	152	13	93	3	109	417
04:45 PM	3	1	7	11	48	96	5	5	154	21	2	101	124	16	105	4	125	414
Total	16	6	35	57	175	404	17	27	623	125	14	375	514	62	392	19	473	1667
05:00 PM	4	2	8	14	48	107	6	6	167	29	11	120	160	15	108	6	129	470
05:15 PM	1	1	9	11	47	80	4	0	131	27	15	107	149	32	96	7	135	426
05:30 PM	4	5	12	21	40	103	7	11	161	15	2	59	76	15	95	9	119	377
05:45 PM	2	3	13	18	42	89	5	6	142	10	2	38	50	17	118	4	139	349
Total	11	11	42	64	177	379	22	23	601	81	30	324	435	79	417	26	522	1622
Grand Total	27	17	77	121	352	783	39	50	1224	206	44	699	949	141	809	45	995	3289
Apprch %	22.3	14	63.6		28.8	64	3.2	4.1		21.7	4.6	73.7		14.2	81.3	4.5		
Total %	0.8	0.5	2.3	3.7	10.7	23.8	1.2	1.5	37.2	6.3	1.3	21.3	28.9	4.3	24.6	1.4	30.3	

Start Time	Annrae Street Southbound				Mesa College Drive Westbound					Health Center Drive Northbound				Mesa College Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 04:15 PM																		
04:15 PM	4	1	8	13	<b>61</b>	<b>116</b>	<b>6</b>	<b>10</b>	<b>193</b>	34	4	82	120	14	90	4	108	434
04:30 PM	7	2	9	18	38	95	1	4	138	41	4	107	152	13	93	3	109	417
04:45 PM	3	1	7	11	48	96	5	5	154	21	2	101	124	16	105	4	125	414
05:00 PM	4	2	8	14	48	107	6	6	167	29	<b>11</b>	<b>120</b>	<b>160</b>	15	<b>108</b>	<b>6</b>	<b>129</b>	<b>470</b>
Total Volume	18	6	32	56	195	414	18	25	652	125	21	410	556	58	396	17	471	1735
% App. Total	32.1	10.7	57.1		29.9	63.5	2.8	3.8		22.5	3.8	73.7		12.3	84.1	3.6		
PHF	.643	.750	.889	.778	.799	.892	.750	.625	.845	.762	.477	.854	.869	.906	.917	.708	.913	.923

City of San Diego  
 N/S: Annrae Street/Health Center Drive  
 E/W: Mesa College Drive  
 Weather: Clear

File Name : 01\_SDG\_Ann\_MC PM  
 Site Code : 05723035  
 Start Date : 1/11/2023  
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	05:00 PM				04:15 PM				04:30 PM				05:00 PM				
+0 mins.	4	2	8	14	61	116	6	10	193	41	4	107	152	15	108	6	129
+15 mins.	1	1	9	11	38	95	1	4	138	21	2	101	124	32	96	7	135
+30 mins.	4	5	12	21	48	96	5	5	154	29	11	120	160	15	95	9	119
+45 mins.	2	3	13	18	48	107	6	6	167	27	15	107	149	17	118	4	139
Total Volume	11	11	42	64	195	414	18	25	652	118	32	435	585	79	417	26	522
% App. Total	17.2	17.2	65.6		29.9	63.5	2.8	3.8		20.2	5.5	74.4		15.1	79.9	5	
PHF	.688	.550	.808	.762	.799	.892	.750	.625	.845	.720	.533	.906	.914	.617	.883	.722	.939

# Turn Count Summary

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** Genesee Ave @ SR-163 SB Ramps

**Date of Count:** Thursday, July 06, 2017

**Analysts:** LV/CD

**Weather:** Sunny

**AVC Proj No:** 17-0711



# Vehicular Count

Accurate Video Counts Inc  
info@accuratevideocounts.com  
(619) 987-5136



**Location:** Genesee Ave @ SR-163 SB Ramps

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	38	0	138	42	67	0	251	0	0	0	114	0	650
7:15 AM	69	0	183	47	86	0	173	0	0	0	110	0	668
7:30 AM	65	0	178	73	111	0	153	0	0	0	154	0	734
7:45 AM	77	0	179	56	125	0	172	0	0	0	147	0	756
8:00 AM	93	0	142	19	121	0	222	0	0	0	113	0	710
8:15 AM	84	0	173	18	114	0	156	0	0	0	144	0	689
8:30 AM	86	0	159	63	114	0	134	0	0	0	148	0	704
8:45 AM	67	0	169	39	105	0	162	0	0	0	134	0	676
<b>Total</b>	<b>579</b>	<b>0</b>	<b>1,321</b>	<b>357</b>	<b>843</b>	<b>0</b>	<b>1,423</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,064</b>	<b>0</b>	<b>5,587</b>

AM Intersection Peak Hour : **7:30 AM - 8:30 AM**

Intersection PHF : **0.96**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	319	0	672	166	471	0	703	0	0	0	558	0	2,889
PHF	0.86	#####	0.94	0.57	0.94	#####	0.79	#####	#####	#####	0.91	#####	0.96
Movement PHF		0.96			0.87			0.79			0.91		0.96

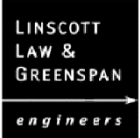
PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	130	0	82	166	144	0	39	0	0	0	157	0	718
4:15 PM	118	0	74	115	203	0	13	0	0	0	174	0	697
4:30 PM	120	0	61	209	165	0	15	0	0	0	206	0	776
4:45 PM	103	0	72	155	165	0	59	0	0	0	188	0	742
5:00 PM	106	0	73	199	169	0	52	0	0	0	174	0	773
5:15 PM	102	0	52	138	208	0	73	0	0	0	181	0	754
5:30 PM	147	0	69	86	177	0	62	0	0	0	185	0	726
5:45 PM	101	0	50	36	146	0	75	0	0	0	150	0	558
<b>Total</b>	<b>927</b>	<b>0</b>	<b>533</b>	<b>1,104</b>	<b>1,377</b>	<b>0</b>	<b>388</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,415</b>	<b>0</b>	<b>5,744</b>

PM Intersection Peak Hour : **4:30 PM - 5:30 PM**

Intersection PHF : **0.98**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	431	0	258	701	707	0	199	0	0	0	749	0	3045
PHF	0.90	#####	0.884	0.839	0.85	#####	0.682	#####	#####	#####	0.909	#####	0.98
Movement PHF		0.95			0.94			0.68			0.91		0.98

## Intersection Turning Movement - Peak Hour Vehicle Count



<b>Location:</b>	#05	<b>File Name:</b>	ITM-22-057-05
<b>Intersection:</b>	SR-163 NB Ramps & Genesee Avenue & Cardinal Drive	<b>Project:</b>	LLG Ref. 3-22-3445
<b>Date of Count:</b>	Tuesday, June 14, 2022		Juvenile Justice

AM	SR-163 NB Ramps Southbound			Genesee Avenue Westbound			Cardinal Drive Northbound			Genesee Avenue Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	0	0	43	2	43	45	26	36	2	132	280	42	651
7:15	0	0	64	3	45	50	47	43	7	118	318	43	738
7:30	0	0	73	11	109	116	50	53	6	141	383	82	1024
7:45	0	0	93	20	118	103	68	58	7	86	346	97	996
8:00	0	0	93	15	79	89	49	61	1	138	337	78	940
8:15	0	0	75	6	50	58	59	42	7	148	309	55	809
8:30	0	0	68	11	54	68	33	53	12	134	292	75	800
8:45	0	0	60	6	51	67	40	34	6	142	291	69	766
<b>Total</b>	<b>0</b>	<b>0</b>	<b>569</b>	<b>74</b>	<b>549</b>	<b>596</b>	<b>372</b>	<b>380</b>	<b>48</b>	<b>1039</b>	<b>2556</b>	<b>541</b>	<b>6724</b>
Approach%	-	-	100.0	6.1	45.0	48.9	46.5	47.5	6.0	25.1	61.8	13.1	
Total%	-	-	8.5	1.1	8.2	8.9	5.5	5.7	0.7	15.5	38.0	8.0	

**AM Intersection Peak Hour: 07:30 to 08:30**

Volume	-	-	334	52	356	366	226	214	21	513	1,375	312	3,769
Approach%	-	-	100.0	6.7	46.0	47.3	49.0	46.4	4.6	23.3	62.5	14.2	
Total%	-	-	8.9	1.4	9.4	9.7	6.0	5.7	0.6	13.6	36.5	8.3	
PHF			0.90			0.80			0.87			0.91	0.92

PM	SR-163 NB Ramps Southbound			Genesee Avenue Westbound			Cardinal Drive Northbound			Genesee Avenue Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	0	0	88	3	117	158	41	38	6	143	144	89	827
16:15	0	0	79	3	126	142	68	40	6	129	115	78	786
16:30	0	0	92	9	135	165	40	37	4	121	100	85	788
16:45	0	0	90	12	122	165	60	32	8	108	86	67	750
17:00	0	0	93	3	146	188	54	51	10	133	72	74	824
17:15	0	0	92	7	123	174	40	33	7	129	86	85	776
17:30	0	0	81	1	99	128	34	17	3	99	73	69	604
17:45	0	0	95	7	82	95	40	39	9	86	84	67	604
<b>Total</b>	<b>0</b>	<b>0</b>	<b>710</b>	<b>45</b>	<b>950</b>	<b>1215</b>	<b>377</b>	<b>287</b>	<b>53</b>	<b>948</b>	<b>760</b>	<b>614</b>	<b>5959</b>
Approach%	-	-	100.0	2.0	43.0	55.0	52.6	40.0	7.4	40.8	32.7	26.4	
Total%	-	-	11.9	0.8	15.9	20.4	6.3	4.8	0.9	15.9	12.8	10.3	

**PM Intersection Peak Hour: 16:00 to 17:00**

Volume	-	-	349	27	500	630	209	147	24	501	445	319	3,151
Approach%	-	-	100.0	2.3	43.2	54.5	55.0	38.7	6.3	39.6	35.2	25.2	
Total%	-	-	11.1	0.9	15.9	20.0	6.6	4.7	0.8	15.9	14.1	10.1	
PHF			0.95			0.94			0.83			0.84	0.95

## Intersection Turning Movement - Bicycle & Pedestrian Count

<b>LINSCOTT LAW &amp; GREENSPAN</b> <i>engineers</i>	Location: #05	File Name: ITM-22-057-05
	Intersection: SR-163 NB Ramps & Genesee Avenue & Cardinal Drive	Project: LLG Ref. 3-22-3445
	Date of Count: Tuesday, June 14, 2022	Juvenile Justice

AM	SR-163 NB Ramps Southbound				Genesee Avenue Westbound				Cardinal Drive Northbound				Genesee Avenue Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	4	0
7:15	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	3	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:00	0	0	0	0	0	0	1	0	3	0	0	0	0	0	1	0	3	2
8:15	0	0	0	0	2	0	0	0	5	0	0	0	0	0	0	0	7	0
8:30	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0
8:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
Ped Total	0				9				12					0			21	
Bike Total		0	0	0		0	1	0		0	0	1		0	2	0		4

PM	SR-163 NB Ramps Southbound				Genesee Avenue Westbound				Cardinal Drive Northbound				Genesee Avenue Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
17:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Ped Total	0				1				2					0			3	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

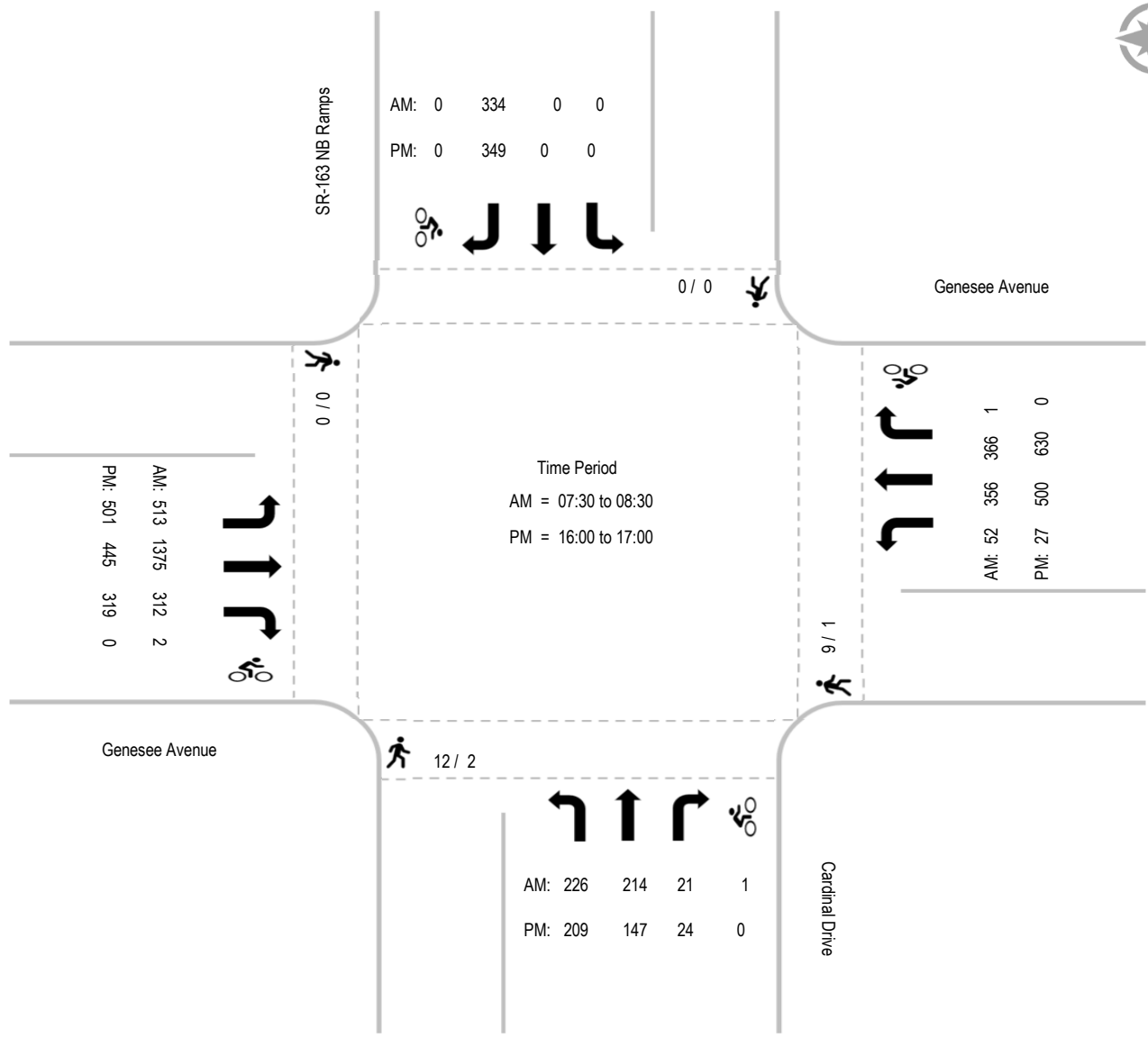


# Intersection Turning Movement - Peak Hour Summary

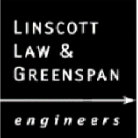


Location: #05  
 Intersection: SR-163 NB Ramps & Genesee Avenue & Cardinal Drive  
 Date of Count: Tuesday, June 14, 2022

File Name: ITM-22-057-05  
 Project: LLG Ref. 3-22-3445  
 Juvenile Justice



## Intersection Turning Movement - Peak Hour Vehicle Count



Location: #04	File Name: ITM-22-057-04
Intersection: Health Center Drive & Starling Drive	Project: LLG Ref. 3-22-3445
Date of Count: Tuesday, June 14, 2022	Juvenile Justice

AM	Health Center Drive Southbound			Starling Drive Westbound			Health Center Drive Northbound			Starling Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	1	0	26	0	55	4	0	0	0	123	129	0	338
7:15	1	0	55	0	46	0	0	0	0	169	160	0	431
7:30	4	0	129	0	81	7	0	0	0	199	157	0	577
7:45	4	0	95	0	87	5	1	0	0	195	130	0	517
8:00	0	0	78	0	58	5	0	0	1	176	180	1	499
8:15	2	0	53	0	52	3	1	0	1	176	151	0	439
8:30	0	0	64	0	59	2	0	0	0	154	117	0	396
8:45	1	0	53	0	42	3	1	0	1	163	112	0	376
<b>Total</b>	<b>13</b>	<b>0</b>	<b>553</b>	<b>0</b>	<b>480</b>	<b>29</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>1355</b>	<b>1136</b>	<b>1</b>	<b>3573</b>
Approach%	2.3	-	97.7	-	94.3	5.7	50.0	-	50.0	54.4	45.6	0.0	
Total%	0.4	-	15.5	-	13.4	0.8	0.1	-	0.1	37.9	31.8	0.0	

**AM Intersection Peak Hour: 07:30 to 08:30**

Volume	10	-	355	-	278	20	2	-	2	746	618	1	2,032
Approach%	2.7	-	97.3	-	93.3	6.7	50.0	-	50.0	54.7	45.3	0.1	
Total%	0.5	-	17.5	-	13.7	1.0	0.1	-	0.1	36.7	30.4	0.0	
PHF			0.69			0.81			0.50			0.96	0.88

PM	Health Center Drive Southbound			Starling Drive Westbound			Health Center Drive Northbound			Starling Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	3	0	184	0	97	4	0	0	0	72	50	0	410
16:15	1	0	195	0	106	3	0	0	0	55	50	1	411
16:30	2	0	206	0	114	2	0	0	0	44	58	2	428
16:45	2	0	157	0	137	1	0	0	0	60	44	0	401
17:00	2	1	213	0	117	0	0	0	1	37	39	0	410
17:15	0	2	189	0	119	0	0	0	0	43	52	2	407
17:30	1	0	120	0	108	1	2	0	0	52	48	0	332
17:45	0	0	122	0	86	0	1	0	0	46	43	0	298
<b>Total</b>	<b>11</b>	<b>3</b>	<b>1386</b>	<b>0</b>	<b>884</b>	<b>11</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>409</b>	<b>384</b>	<b>5</b>	<b>3097</b>
Approach%	0.8	0.2	99.0	-	98.8	1.2	75.0	-	25.0	51.3	48.1	0.6	
Total%	0.4	0.1	44.8	-	28.5	0.4	0.1	-	0.0	13.2	12.4	0.2	

**PM Intersection Peak Hour: 16:00 to 17:00**

Volume	8	-	742	-	454	10	-	-	-	231	202	3	1,650
Approach%	1.1	-	98.9	-	97.8	2.2	-	-	-	53.0	46.3	0.7	
Total%	0.5	-	45.0	-	27.5	0.6	-	-	-	14.0	12.2	0.2	
PHF			0.90			0.84			#DIV/0!			0.89	0.96

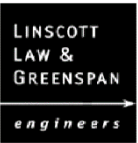
## Intersection Turning Movement - Bicycle & Pedestrian Count

<b>LINSCOTT LAW &amp; GREENSPAN</b> <i>engineers</i>	Location: #04	File Name: ITM-22-057-04
	Intersection: Health Center Drive & Starling Drive	Project: LLG Ref. 3-22-3445
	Date of Count: Tuesday, June 14, 2022	Juvenile Justice

AM	Health Center Drive Southbound				Starling Drive Westbound				Health Center Drive Northbound				Starling Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0			0	0	0			0		0	4	0		4

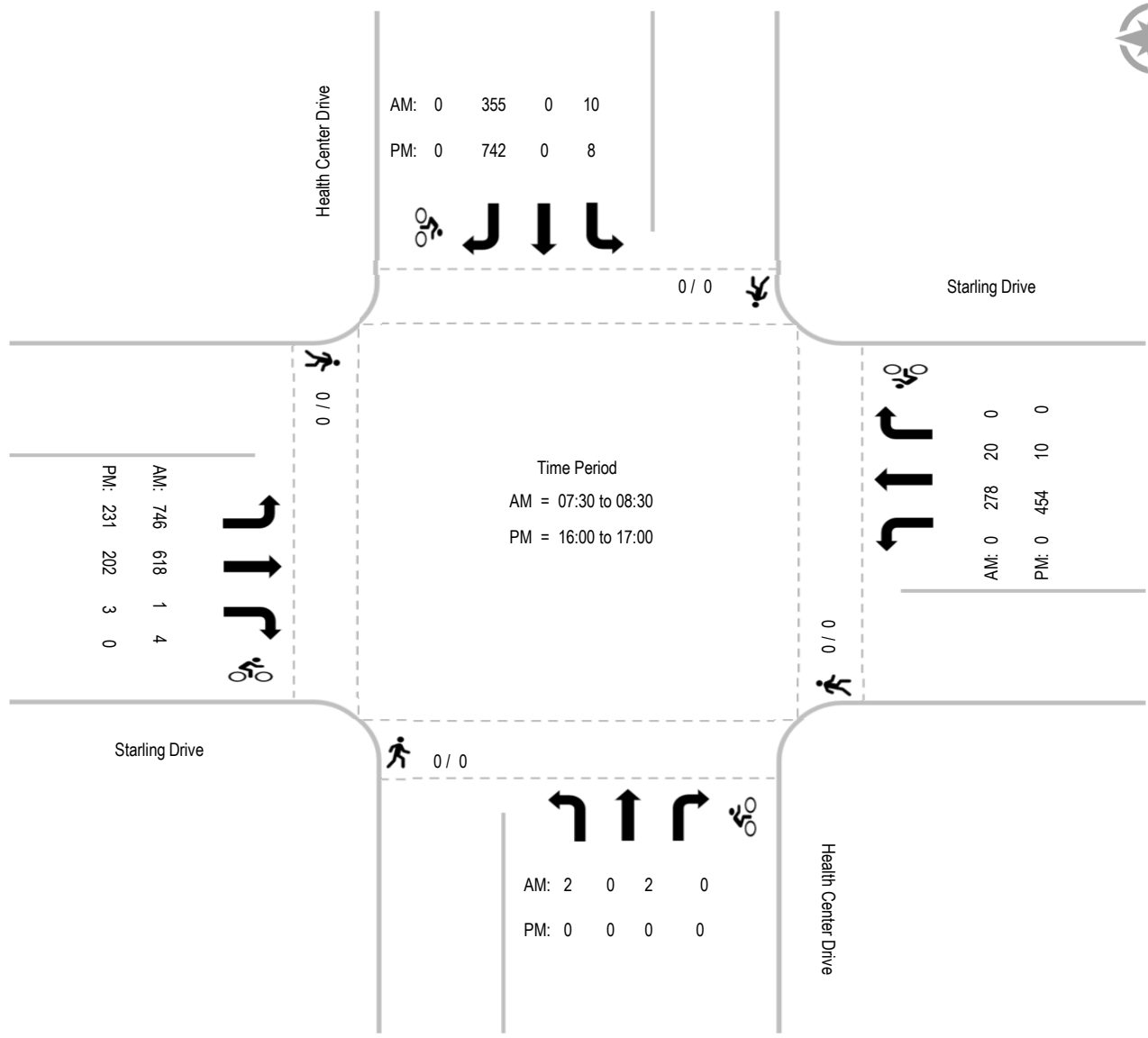
PM	Health Center Drive Southbound				Starling Drive Westbound				Health Center Drive Northbound				Starling Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0			0	0	0			0		0	0	0		0

# Intersection Turning Movement - Peak Hour Summary



Location: #04  
 Intersection: Health Center Drive & Starling Drive  
 Date of Count: Tuesday, June 14, 2022

File Name: ITM-22-057-04  
 Project: LLG Ref. 3-22-3445  
 Juvenile Justice



INTERSECTION	DIRECTION	RAW EXISTING						Count Date	ADJUSTMENT (1% PER YEAR)						EXISTING FIGURE 4					
		Ram	Rpm	Tam	Tpm	Lam	Lpm		Ram	Rpm	Tam	Tpm	Lam	Lpm	Ram	Rpm	Tam	Tpm	Lam	Lpm
1. Mesa College Drive / Health Center Drive	Sb	44	32	27	6	27	18	Wednesday, January 11, 2023	0	0	0	0	0	0	44	32	27	6	27	18
	Wb	20	18	483	414	697	220		0	0	0	0	0	0	20	18	483	414	697	220
	Nb	122	410	2	21	45	125		0	0	0	0	0	0	122	410	2	21	45	125
	Eb	186	17	643	396	26	58		0	0	0	0	0	0	186	17	643	396	26	58
2. Genesee Avenue / SR 163 SB off-ramp	Sb	319	431	0	0	672	258	Thursday, July 6, 2017	20	27	0	0	41	16	339	458	0	0	713	274
	Wb	0	0	471	707	0	0		0	0	29	43	0	0	0	0	500	750	0	0
	Nb	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
	Eb	0	0	558	749	0	0		0	0	34	46	0	0	0	0	592	795	0	0
3. Genesee Avenue / SR 163 NB ramps / Cardinal Rd	Sb	334	349	0	0	0	0	Tuesday, June 14, 2022	3	3	0	0	0	0	337	352	0	0	0	0
	Wb	356	630	356	500	52	27		4	6	4	5	1	0	360	636	360	505	53	27
	Nb	21	24	214	147	226	209		0	0	2	1	2	2	21	24	216	148	228	211
	Eb	312	319	1375	445	513	501		3	3	14	4	5	5	315	322	1389	449	518	506
4. Genesee Avenue / Health Center Drive	Sb	355	742	0	0	10	8	Tuesday, June 14, 2022	4	7	0	0	0	0	359	749	0	0	10	8
	Wb	20	10	278	454	0	0		0	0	3	5	0	0	20	10	281	459	0	0
	Nb	2	0	0	0	2	0		0	0	0	0	0	0	2	0	0	0	2	0
	Eb	1	3	618	202	746	231		0	0	6	2	7	2	1	3	624	204	753	233

## **ATTACHMENT B**

### **1995 LRPEI TRAFFIC STUDY INTERSECTION ANALYSIS TABLE**

TABLE 4-7

1995 INTERSECTION OPERATIONS WITH AND WITHOUT STAGE I  
AND WITH STAGE I DEVELOPMENT WITH MITIGATION  
Children's Hospital and Health Center, San Diego Medical Center,  
Sharp HealthCare/Sharp Memorial Hospital  
Long Range Plan for Expansion and Improvement

Intersection	1995 Background Traffic (Without Project)				1995 Condition (With Stage I)				1995 Condition (With Mitigation)			
	AM Peak ICU	LOS	PM Peak ICU	LOS	AM Peak ICU	LOS	PM Peak ICU	LOS	AM Peak ICU	LOS	PM Peak ICU	LOS
Genesee Ave. at:												
- Linda Vista Rd.	0.66	B	0.86	D	0.67	B	0.87	D	0.67	B	0.87	D
- SR-163 SB Off-ramp	0.77	C	0.60	A	0.95	E	0.68	B	0.59	A	0.59	A
- SR-163 NB On-ramp	0.69	B	0.63	B	0.83	D	0.73	C	0.83	D	0.73	C
- Health Center Dr.	0.59	A	0.75	C	0.72	C	1.01	F	0.75	C	0.78	C
Meadowlark Drive at:												
- Starling Dr. **	0.66	B	0.66	B	0.78	C	0.83	D	0.78	C	0.83	D
- Vista Hill Ave. **	0.62	B	0.60	A	0.72	C	0.74	C	0.72	C	0.74	C
Mesa College Dr. at:												
- Linda Vista Rd.	0.69	B	1.09	F	0.69	B	1.10	F	0.59	A	0.82	D
- SR-163 NB Off-ramp	0.52	A	0.71	C	0.54	A	0.74	C	0.54	A	0.74	C
- Health Center Dr.	0.73	C	0.97	E	0.81	D	1.04	F	0.81	D	0.87	D
- I-805 SB On-ramp	N/A*	A	N/A*	E	N/A*	A	N/A*	F	0.48	A	0.80	C
- I-805 NB Off-ramp	0.56	A	0.60	A	0.61	B	0.62	B	0.61	B	0.62	B
Aero Drive at:												
- Kearny Villa Rd.	0.67	B	0.84	D	0.68	B	0.85	D	0.68	B	0.85	D
- Linda Vista Rd./ Convoy St.	0.64	B	0.78	C	0.65	B	0.81	D	0.65	B	0.81	D

Notes: NB = Northbound SB = Southbound ICU = Intersection Capacity Utilization LOS = Level of Service  
Assuming that improvements stipulated in conjunction with the approved CUPs are made.

\* Intersection is unsignalized. Level of services are analyzed using the Highway Capacity Manual method for evaluation of unsignalized intersections.

\*\* Assumed to be signalized.

Source: Basmacyan-Darnell, Inc., May 1991 and December 1991.

**ATTACHMENT C**  
**PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS –**  
**EXISTING**



HCM 6th Signalized Intersection Summary  
 1: Health Center Dr/Annrae St & Mesa College Dr

Ex AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶	↷	↷	↶	↷	↷	↶	↷	↷
Traffic Volume (veh/h)	26	643	186	697	483	20	45	2	122	27	27	44
Future Volume (veh/h)	26	643	186	697	483	20	45	2	122	27	27	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	699	0	758	525	22	49	0	134	29	29	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	928		815	1657	69	505	0	898	108	38	63
Arrive On Green	0.02	0.26	0.00	0.24	0.48	0.48	0.28	0.00	0.28	0.06	0.06	0.06
Sat Flow, veh/h	1781	3554	1585	3456	3476	145	1781	0	3170	1781	633	1048
Grp Volume(v), veh/h	28	699	0	758	268	279	49	0	134	29	0	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1844	1781	0	1585	1781	0	1682
Q Serve(g_s), s	1.9	21.7	0.0	25.8	11.2	11.2	2.4	0.0	3.8	1.9	0.0	5.4
Cycle Q Clear(g_c), s	1.9	21.7	0.0	25.8	11.2	11.2	2.4	0.0	3.8	1.9	0.0	5.4
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	36	928		815	847	879	505	0	898	108	0	102
V/C Ratio(X)	0.78	0.75		0.93	0.32	0.32	0.10	0.00	0.15	0.27	0.00	0.76
Avail Cap(c_a), veh/h	92	928		852	847	879	505	0	898	150	0	142
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.5	40.8	0.0	44.9	19.3	19.3	31.7	0.0	32.2	53.8	0.0	55.5
Incr Delay (d2), s/veh	12.4	5.6	0.0	15.9	0.3	0.3	0.4	0.0	0.4	0.5	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.2	0.0	12.8	4.7	4.9	1.1	0.0	1.5	0.9	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	46.4	0.0	60.7	19.7	19.7	32.1	0.0	32.5	54.3	0.0	63.8
LnGrp LOS	E	D		E	B	B	C	A	C	D	A	E
Approach Vol, veh/h		727	A		1305			183				106
Approach Delay, s/veh		47.3			43.5			32.4				61.2
Approach LOS		D			D			C				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.7	36.2		12.2	6.8	62.1		38.9				
Change Period (Y+Rc), s	4.4	4.9		4.9	4.4	4.9		4.9				
Max Green Setting (Gmax), s	29.6	27.2		10.1	6.2	50.6		34.0				
Max Q Clear Time (g_c+I1), s	27.8	23.7		7.4	3.9	13.2		5.8				
Green Ext Time (p_c), s	0.5	2.1		0.1	0.0	6.2		0.3				

Intersection Summary

HCM 6th Ctrl Delay	44.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.  
 Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary  
 2: Genesee Ave & SR-163 SB Off-Ramp

Ex AM  
 01/17/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓↓	↓
Traffic Volume (veh/h)	0	592	500	0	713	339
Future Volume (veh/h)	0	592	500	0	713	339
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	984	984	0	984	984
Adj Flow Rate, veh/h	0	643	543	0	775	368
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	782	782	0	920	409
Arrive On Green	0.00	0.42	0.42	0.00	0.49	0.49
Sat Flow, veh/h	0	1969	1969	0	1875	834
Grp Volume(v), veh/h	0	643	543	0	775	368
Grp Sat Flow(s),veh/h/ln	0	935	935	0	938	834
Q Serve(g_s), s	0.0	36.6	28.6	0.0	43.0	48.2
Cycle Q Clear(g_c), s	0.0	36.6	28.6	0.0	43.0	48.2
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	782	782	0	920	409
V/C Ratio(X)	0.00	0.82	0.69	0.00	0.84	0.90
Avail Cap(c_a), veh/h	0	782	782	0	920	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.97	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.9	28.6	0.0	26.5	27.8
Incr Delay (d2), s/veh	0.0	9.5	4.9	0.0	9.2	25.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.1	6.8	0.0	10.5	12.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	40.4	33.5	0.0	35.7	53.0
LnGrp LOS	A	D	C	A	D	D
Approach Vol, veh/h		643	543		1143	
Approach Delay, s/veh		40.4	33.5		41.3	
Approach LOS		D	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		56.0		64.0		56.0
Change Period (Y+Rc), s		5.8		5.1		5.8
Max Green Setting (Gmax), s		50.2		58.9		50.2
Max Q Clear Time (g_c+I1), s		38.6		50.2		30.6
Green Ext Time (p_c), s		2.4		1.3		2.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			39.2			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Cardinal Rd/SR 163 NB ramps & Genesee Ave

Ex AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔			↔	↔
Traffic Volume (veh/h)	518	1389	315	53	360	360	228	216	21	0	0	337
Future Volume (veh/h)	518	1389	315	53	360	360	228	216	21	0	0	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	563	1510	342	58	391	391	248	235	23	0	0	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	613	1530	336	190	1626	725	246	257	25	0	89	713
Arrive On Green	0.35	1.00	1.00	0.04	0.15	0.15	0.15	0.15	0.15	0.00	0.00	0.05
Sat Flow, veh/h	3456	2897	636	1781	3554	1585	1690	1761	173	0	1870	3170
Grp Volume(v), veh/h	563	908	944	58	391	391	262	0	244	0	0	366
Grp Sat Flow(s),veh/h/ln	1728	1777	1756	1781	1777	1585	1786	0	1839	0	1870	1585
Q Serve(g_s), s	18.7	0.0	61.9	3.8	11.6	27.4	17.5	0.0	15.7	0.0	0.0	5.7
Cycle Q Clear(g_c), s	18.7	0.0	61.9	3.8	11.6	27.4	17.5	0.0	15.7	0.0	0.0	5.7
Prop In Lane	1.00		0.36	1.00		1.00	0.95		0.09	0.00		1.00
Lane Grp Cap(c), veh/h	613	938	927	190	1626	725	260	0	268	0	89	713
V/C Ratio(X)	0.92	0.97	1.02	0.30	0.24	0.54	1.01	0.00	0.91	0.00	0.00	0.51
Avail Cap(c_a), veh/h	815	938	927	224	1626	725	260	0	268	0	89	713
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.36	0.36	0.80	0.80	0.80	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	37.9	0.0	0.0	53.5	32.6	39.2	51.3	0.0	50.5	0.0	0.0	40.8
Incr Delay (d2), s/veh	4.6	11.5	22.5	0.3	0.0	0.4	57.3	0.0	31.7	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	3.0	5.8	1.8	5.6	11.7	11.9	0.0	9.5	0.0	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	11.5	22.5	53.8	32.6	39.6	108.6	0.0	82.1	0.0	0.0	41.0
LnGrp LOS	D	B	F	D	C	D	F	A	F	A	A	D
Approach Vol, veh/h		2415			840			506				366
Approach Delay, s/veh		23.0			37.3			95.8				41.0
Approach LOS		C			D			F				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	69.9		10.4	26.0	61.4		22.2				
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	* 6.5		4.7				
Max Green Setting (Gmax), s	* 15	61.1		* 5.7	* 28	* 49		17.5				
Max Q Clear Time (g_c+I1), s	5.8	63.9		7.7	20.7	29.4		19.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.6	2.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
4: Health Center Dr & Genesee Ave/Starling Dr

Ex AM  
01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↑↑			↵			↵			↕	↵
Traffic Volume (veh/h)	753	624	1	0	281	20	2	0	2	10	0	359
Future Volume (veh/h)	753	624	1	0	281	20	2	0	2	10	0	359
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	818	678	1	0	305	22	2	0	2	0	0	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	898	2776	4	0	381	27	133	14	103	0	304	2113
Arrive On Green	0.84	1.00	1.00	0.00	0.22	0.22	0.16	0.00	0.16	0.00	0.00	0.16
Sat Flow, veh/h	1781	3641	5	0	1724	124	545	88	632	0	1870	3170
Grp Volume(v), veh/h	818	331	348	0	0	327	4	0	0	0	0	402
Grp Sat Flow(s),veh/h/ln	1781	1777	1869	0	0	1848	1265	0	0	0	1870	1585
Q Serve(g_s), s	37.4	0.0	0.0	0.0	0.0	20.1	0.0	0.0	0.0	0.0	0.0	5.8
Cycle Q Clear(g_c), s	37.4	0.0	0.0	0.0	0.0	20.1	0.2	0.0	0.0	0.0	0.0	5.8
Prop In Lane	1.00		0.00	0.00		0.07	0.50		0.50	0.00		1.00
Lane Grp Cap(c), veh/h	898	1355	1425	0	0	408	251	0	0	0	304	2113
V/C Ratio(X)	0.91	0.24	0.24	0.00	0.00	0.80	0.02	0.00	0.00	0.00	0.00	0.19
Avail Cap(c_a), veh/h	898	1355	1425	0	0	408	251	0	0	0	304	2113
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.13	0.13	0.13	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	7.7	0.0	0.0	0.0	0.0	44.3	42.2	0.0	0.0	0.0	0.0	7.6
Incr Delay (d2), s/veh	2.5	0.1	0.1	0.0	0.0	15.2	0.1	0.0	0.0	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0	0.0	0.0	11.0	0.1	0.0	0.0	0.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	0.1	0.1	0.0	0.0	59.5	42.3	0.0	0.0	0.0	0.0	7.8
LnGrp LOS	B	A	A	A	A	E	D	A	A	A	A	A
Approach Vol, veh/h		1497			327			4				402
Approach Delay, s/veh		5.6			59.5			42.3				7.8
Approach LOS		A			E			D				A
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		96.0		24.0	65.0	31.0		24.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		91.5		19.5	60.5	26.5		19.5				
Max Q Clear Time (g_c+I1), s		2.0		7.8	39.4	22.1		2.2				
Green Ext Time (p_c), s		5.2		1.3	3.3	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 1: Health Center Dr/Annrae St & Mesa College Dr

Ex PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶↷	↷		↶	↷	↷	↶	↷	↷
Traffic Volume (veh/h)	58	396	17	220	414	18	125	21	410	18	6	32
Future Volume (veh/h)	58	396	17	220	414	18	125	21	410	18	6	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	430	0	239	450	20	136	0	461	20	7	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	1089		313	1218	54	682	0	1214	67	10	51
Arrive On Green	0.05	0.31	0.00	0.09	0.35	0.35	0.38	0.00	0.38	0.04	0.04	0.04
Sat Flow, veh/h	1781	3554	1585	3456	3466	154	1781	0	3170	1781	271	1355
Grp Volume(v), veh/h	63	430	0	239	230	240	136	0	461	20	0	42
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1843	1781	0	1585	1781	0	1626
Q Serve(g_s), s	3.7	10.0	0.0	7.1	10.1	10.2	5.3	0.0	11.0	1.1	0.0	2.7
Cycle Q Clear(g_c), s	3.7	10.0	0.0	7.1	10.1	10.2	5.3	0.0	11.0	1.1	0.0	2.7
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		0.83
Lane Grp Cap(c), veh/h	81	1089		313	624	648	682	0	1214	67	0	61
V/C Ratio(X)	0.77	0.39		0.76	0.37	0.37	0.20	0.00	0.38	0.30	0.00	0.69
Avail Cap(c_a), veh/h	231	1089		614	629	653	682	0	1214	172	0	157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.4	28.7	0.0	46.5	25.3	25.3	21.6	0.0	23.3	49.0	0.0	49.8
Incr Delay (d2), s/veh	5.8	1.1	0.0	2.9	0.6	0.6	0.7	0.0	0.9	0.9	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.4	0.0	3.2	4.3	4.5	2.3	0.0	4.2	0.5	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	29.7	0.0	49.4	25.9	25.9	22.2	0.0	24.2	50.0	0.0	54.8
LnGrp LOS	E	C		D	C	C	C	A	C	D	A	D
Approach Vol, veh/h		493	A		709			597				62
Approach Delay, s/veh		33.0			33.8			23.8				53.2
Approach LOS		C			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.9	37.0		8.8	9.2	41.7		45.0				
Change Period (Y+Rc), s	4.4	4.9		4.9	4.4	4.9		4.9				
Max Green Setting (Gmax), s	18.6	32.1		10.1	13.6	37.1		40.1				
Max Q Clear Time (g_c+I1), s	9.1	12.0		4.7	5.7	12.2		13.0				
Green Ext Time (p_c), s	0.4	4.7		0.0	0.0	4.6		1.3				

Intersection Summary

HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 2: Genesee Ave & SR-163 SB Off-Ramp

Ex PM  
01/17/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓↓↓	↓
Traffic Volume (veh/h)	0	795	750	0	274	458
Future Volume (veh/h)	0	795	750	0	274	458
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	864	815	0	265	533
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1901	1901	0	667	1186
Arrive On Green	0.00	0.54	0.54	0.00	0.37	0.37
Sat Flow, veh/h	0	3741	3741	0	1781	3170
Grp Volume(v), veh/h	0	864	815	0	265	533
Grp Sat Flow(s),veh/h/ln	0	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	17.9	16.6	0.0	13.1	15.2
Cycle Q Clear(g_c), s	0.0	17.9	16.6	0.0	13.1	15.2
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1901	1901	0	667	1186
V/C Ratio(X)	0.00	0.45	0.43	0.00	0.40	0.45
Avail Cap(c_a), veh/h	0	1901	1901	0	667	1186
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.95	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.1	16.8	0.0	27.6	28.2
Incr Delay (d2), s/veh	0.0	0.8	0.7	0.0	1.8	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.4	6.9	0.0	5.9	6.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	17.9	17.5	0.0	29.4	29.5
LnGrp LOS	A	B	B	A	C	C
Approach Vol, veh/h		864	815		798	
Approach Delay, s/veh		17.9	17.5		29.4	
Approach LOS		B	B		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		70.0		50.0		70.0
Change Period (Y+Rc), s		5.8		5.1		5.8
Max Green Setting (Gmax), s		64.2		44.9		64.2
Max Q Clear Time (g_c+I1), s		19.9		17.2		18.6
Green Ext Time (p_c), s		4.7		1.1		4.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.5			
HCM 6th LOS			C			
<b>Notes</b>						
User approved volume balancing among the lanes for turning movement.						

HCM 6th Signalized Intersection Summary  
 3: Cardinal Rd/SR 163 NB ramps & Genesee Ave

Ex PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔			↔	↔
Traffic Volume (veh/h)	506	449	322	27	505	636	211	148	24	0	0	352
Future Volume (veh/h)	506	449	322	27	505	636	211	148	24	0	0	352
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	550	488	350	29	549	691	229	161	26	0	0	383
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	599	1080	773	138	1600	714	256	226	36	0	114	743
Arrive On Green	0.29	0.91	0.91	0.13	0.75	0.75	0.14	0.14	0.14	0.00	0.00	0.06
Sat Flow, veh/h	3456	1978	1415	1781	3554	1585	1781	1571	254	0	1870	3170
Grp Volume(v), veh/h	550	438	400	29	549	691	229	0	187	0	0	383
Grp Sat Flow(s),veh/h/ln	1728	1777	1616	1781	1777	1585	1781	0	1825	0	1870	1585
Q Serve(g_s), s	18.5	4.4	4.4	1.7	6.2	47.7	15.2	0.0	11.7	0.0	0.0	7.3
Cycle Q Clear(g_c), s	18.5	4.4	4.4	1.7	6.2	47.7	15.2	0.0	11.7	0.0	0.0	7.3
Prop In Lane	1.00		0.88	1.00		1.00	1.00		0.14	0.00		1.00
Lane Grp Cap(c), veh/h	599	971	883	138	1600	714	256	0	262	0	114	743
V/C Ratio(X)	0.92	0.45	0.45	0.21	0.34	0.97	0.89	0.00	0.71	0.00	0.00	0.52
Avail Cap(c_a), veh/h	680	971	883	224	1600	714	263	0	269	0	114	743
HCM Platoon Ratio	1.67	1.67	1.67	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.72	0.72	0.72	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	41.8	2.6	2.6	49.0	8.9	14.1	50.5	0.0	49.0	0.0	0.0	40.0
Incr Delay (d2), s/veh	14.2	1.4	1.5	0.2	0.0	21.0	28.5	0.0	7.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	1.5	1.4	0.8	2.1	12.9	8.8	0.0	5.9	0.0	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.0	3.9	4.1	49.2	9.0	35.1	78.9	0.0	56.1	0.0	0.0	40.3
LnGrp LOS	E	A	A	D	A	D	E	A	E	A	A	D
Approach Vol, veh/h		1388			1269			416				383
Approach Delay, s/veh		24.6			24.1			68.7				40.3
Approach LOS		C			C			E				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	72.1		12.0	25.5	60.5		21.9				
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	* 6.5		4.7				
Max Green Setting (Gmax), s	* 15	59.3		* 7.3	* 24	* 52		17.7				
Max Q Clear Time (g_c+I1), s	3.7	6.4		9.3	20.5	49.7		17.2				
Green Ext Time (p_c), s	0.0	4.4		0.0	0.3	1.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
 4: Health Center Dr & Genesee Ave/Starling Dr

Ex PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑			↖			↖			↕	↗
Traffic Volume (veh/h)	233	204	3	0	459	10	0	0	0	8	0	749
Future Volume (veh/h)	233	204	3	0	459	10	0	0	0	8	0	749
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	253	222	3	0	499	11	0	0	0	0	0	824
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	0	2	2	2	2	2
Cap, veh/h	334	2079	28	0	646	14	0	647	0	0	647	1691
Arrive On Green	0.19	0.58	0.58	0.00	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.35
Sat Flow, veh/h	1781	3590	48	0	1823	40	0	1870	0	0	1870	3170
Grp Volume(v), veh/h	253	110	115	0	0	510	0	0	0	0	0	824
Grp Sat Flow(s),veh/h/ln	1781	1777	1862	0	0	1863	0	1870	0	0	1870	1585
Q Serve(g_s), s	16.1	3.3	3.3	0.0	0.0	29.2	0.0	0.0	0.0	0.0	0.0	19.7
Cycle Q Clear(g_c), s	16.1	3.3	3.3	0.0	0.0	29.2	0.0	0.0	0.0	0.0	0.0	19.7
Prop In Lane	1.00		0.03	0.00		0.02	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	334	1029	1078	0	0	660	0	647	0	0	647	1691
V/C Ratio(X)	0.76	0.11	0.11	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.49
Avail Cap(c_a), veh/h	334	1029	1078	0	0	660	0	647	0	0	647	1691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	46.2	11.3	11.3	0.0	0.0	34.5	0.0	0.0	0.0	0.0	0.0	17.7
Incr Delay (d2), s/veh	13.6	0.2	0.2	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	1.4	1.5	0.0	0.0	14.8	0.0	0.0	0.0	0.0	0.0	20.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	11.5	11.5	0.0	0.0	43.0	0.0	0.0	0.0	0.0	0.0	18.7
LnGrp LOS	E	B	B	A	A	D	A	A	A	A	A	B
Approach Vol, veh/h		478			510			0				824
Approach Delay, s/veh		37.1			43.0			0.0				18.7
Approach LOS		D			D							B
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		74.0		46.0	27.0	47.0		46.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		69.5		41.5	22.5	42.5		41.5				
Max Q Clear Time (g_c+I1), s		5.3		21.7	18.1	31.2		0.0				
Green Ext Time (p_c), s		1.5		3.6	0.3	2.6		0.0				

Intersection Summary

HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



## **ATTACHMENT D**

### **PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – OPENING YEAR**

HCM 6th Signalized Intersection Summary  
 1: Health Center Dr/Annrae St & Mesa College Dr

Ex + C AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶↷	↷		↶	↷	↷	↶	↷	↷
Traffic Volume (veh/h)	26	643	200	697	483	20	50	2	122	27	27	44
Future Volume (veh/h)	26	643	200	697	483	20	50	2	122	27	27	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	699	0	758	525	22	54	0	134	29	29	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	929		815	1658	69	505	0	898	107	38	63
Arrive On Green	0.02	0.26	0.00	0.24	0.48	0.48	0.28	0.00	0.28	0.06	0.06	0.06
Sat Flow, veh/h	1781	3554	1585	3456	3476	145	1781	0	3170	1781	633	1048
Grp Volume(v), veh/h	28	699	0	758	268	279	54	0	134	29	0	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1844	1781	0	1585	1781	0	1682
Q Serve(g_s), s	1.9	21.7	0.0	25.8	11.1	11.2	2.7	0.0	3.8	1.9	0.0	5.4
Cycle Q Clear(g_c), s	1.9	21.7	0.0	25.8	11.1	11.2	2.7	0.0	3.8	1.9	0.0	5.4
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	36	929		815	848	880	505	0	898	107	0	101
V/C Ratio(X)	0.78	0.75		0.93	0.32	0.32	0.11	0.00	0.15	0.27	0.00	0.76
Avail Cap(c_a), veh/h	92	929		852	848	880	505	0	898	128	0	121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.5	40.7	0.0	44.9	19.3	19.3	31.8	0.0	32.2	53.9	0.0	55.5
Incr Delay (d2), s/veh	12.4	5.6	0.0	15.9	0.3	0.3	0.4	0.0	0.4	0.5	0.0	16.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.2	0.0	12.8	4.7	4.9	1.2	0.0	1.5	0.9	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	46.4	0.0	60.7	19.7	19.7	32.2	0.0	32.5	54.4	0.0	72.0
LnGrp LOS	E	D		E	B	B	C	A	C	D	A	E
Approach Vol, veh/h		727	A		1305			188				106
Approach Delay, s/veh		47.3			43.5			32.4				67.2
Approach LOS		D			D			C				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.7	36.3		12.1	6.8	62.2		38.9				
Change Period (Y+Rc), s	4.4	4.9		4.9	4.4	4.9		4.9				
Max Green Setting (Gmax), s	29.6	28.7		8.6	6.2	52.1		34.0				
Max Q Clear Time (g_c+I1), s	27.8	23.7		7.4	3.9	13.2		5.8				
Green Ext Time (p_c), s	0.5	2.9		0.0	0.0	6.2		0.4				

Intersection Summary

HCM 6th Ctrl Delay	44.9
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.  
 Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 2: Genesee Ave & SR-163 SB Off-Ramp

Ex + C AM  
01/17/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓↓	↓
Traffic Volume (veh/h)	0	605	503	0	739	350
Future Volume (veh/h)	0	605	503	0	739	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	984	984	0	984	984
Adj Flow Rate, veh/h	0	658	547	0	803	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	782	782	0	920	409
Arrive On Green	0.00	0.42	0.42	0.00	0.49	0.49
Sat Flow, veh/h	0	1969	1969	0	1875	834
Grp Volume(v), veh/h	0	658	547	0	803	380
Grp Sat Flow(s),veh/h/ln	0	935	935	0	938	834
Q Serve(g_s), s	0.0	37.9	28.9	0.0	45.8	51.1
Cycle Q Clear(g_c), s	0.0	37.9	28.9	0.0	45.8	51.1
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	782	782	0	920	409
V/C Ratio(X)	0.00	0.84	0.70	0.00	0.87	0.93
Avail Cap(c_a), veh/h	0	782	782	0	920	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.97	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	31.3	28.7	0.0	27.2	28.6
Incr Delay (d2), s/veh	0.0	10.6	5.0	0.0	11.2	29.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.5	6.9	0.0	11.3	13.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	41.9	33.7	0.0	38.4	58.2
LnGrp LOS	A	D	C	A	D	E
Approach Vol, veh/h		658	547		1183	
Approach Delay, s/veh		41.9	33.7		44.8	
Approach LOS		D	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		56.0		64.0		56.0
Change Period (Y+Rc), s		5.8		5.1		5.8
Max Green Setting (Gmax), s		50.2		58.9		50.2
Max Q Clear Time (g_c+I1), s		39.9		53.1		30.9
Green Ext Time (p_c), s		2.3		1.1		2.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			41.4			
HCM 6th LOS			D			

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Cardinal Rd/SR 163 NB ramps & Genesee Ave

Ex + C AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔			↕	↔
Traffic Volume (veh/h)	521	1447	315	53	372	368	228	216	22	0	0	337
Future Volume (veh/h)	521	1447	315	53	372	368	228	216	22	0	0	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	566	1573	342	58	404	400	248	235	24	0	0	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	616	1543	324	190	1623	724	246	256	26	0	89	716
Arrive On Green	0.36	1.00	1.00	0.04	0.15	0.15	0.15	0.15	0.15	0.00	0.00	0.05
Sat Flow, veh/h	3456	2923	614	1781	3554	1585	1687	1757	181	0	1870	3170
Grp Volume(v), veh/h	566	935	980	58	404	400	263	0	244	0	0	366
Grp Sat Flow(s),veh/h/ln	1728	1777	1760	1781	1777	1585	1786	0	1838	0	1870	1585
Q Serve(g_s), s	18.8	0.0	59.3	3.8	12.0	28.1	17.5	0.0	15.7	0.0	0.0	5.7
Cycle Q Clear(g_c), s	18.8	0.0	59.3	3.8	12.0	28.1	17.5	0.0	15.7	0.0	0.0	5.7
Prop In Lane	1.00		0.35	1.00		1.00	0.94		0.10	0.00		1.00
Lane Grp Cap(c), veh/h	616	938	929	190	1623	724	260	0	268	0	89	716
V/C Ratio(X)	0.92	1.00	1.05	0.30	0.25	0.55	1.01	0.00	0.91	0.00	0.00	0.51
Avail Cap(c_a), veh/h	815	938	929	224	1623	724	260	0	268	0	89	716
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	0.78	0.78	0.78	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	37.8	0.0	0.0	53.5	32.8	39.6	51.3	0.0	50.5	0.0	0.0	40.7
Incr Delay (d2), s/veh	4.0	15.5	33.2	0.3	0.0	0.4	57.9	0.0	32.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	4.0	8.6	1.8	5.7	12.0	12.0	0.0	9.6	0.0	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	15.5	33.2	53.8	32.8	40.0	109.2	0.0	82.6	0.0	0.0	40.9
LnGrp LOS	D	B	F	D	C	D	F	A	F	A	A	D
Approach Vol, veh/h		2481			862			507				366
Approach Delay, s/veh		28.5			37.6			96.4				40.9
Approach LOS		C			D			F				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	69.9		10.4	26.1	61.3		22.2				
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	* 6.5		4.7				
Max Green Setting (Gmax), s	* 15	61.1		* 5.7	* 28	* 49		17.5				
Max Q Clear Time (g_c+I1), s	5.8	61.3		7.7	20.8	30.1		19.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.6	2.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	39.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
 4: Health Center Dr & Genesee Ave/Starling Dr

Ex + C AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷			↷			↷			↷	↷
Traffic Volume (veh/h)	785	650	1	0	290	20	2	0	2	10	0	370
Future Volume (veh/h)	785	650	1	0	290	20	2	0	2	10	0	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	853	707	1	0	315	22	2	0	2	0	0	414
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	898	2776	4	0	382	27	133	14	102	0	304	2113
Arrive On Green	0.84	1.00	1.00	0.00	0.22	0.22	0.16	0.00	0.16	0.00	0.00	0.16
Sat Flow, veh/h	1781	3641	5	0	1728	121	541	88	629	0	1870	3170
Grp Volume(v), veh/h	853	345	363	0	0	337	4	0	0	0	0	414
Grp Sat Flow(s),veh/h/ln	1781	1777	1869	0	0	1849	1257	0	0	0	1870	1585
Q Serve(g_s), s	45.3	0.0	0.0	0.0	0.0	20.8	0.0	0.0	0.0	0.0	0.0	6.0
Cycle Q Clear(g_c), s	45.3	0.0	0.0	0.0	0.0	20.8	0.2	0.0	0.0	0.0	0.0	6.0
Prop In Lane	1.00		0.00	0.00		0.07	0.50		0.50	0.00		1.00
Lane Grp Cap(c), veh/h	898	1355	1425	0	0	408	249	0	0	0	304	2113
V/C Ratio(X)	0.95	0.25	0.25	0.00	0.00	0.83	0.02	0.00	0.00	0.00	0.00	0.20
Avail Cap(c_a), veh/h	898	1355	1425	0	0	408	249	0	0	0	304	2113
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	8.3	0.0	0.0	0.0	0.0	44.5	42.2	0.0	0.0	0.0	0.0	7.7
Incr Delay (d2), s/veh	3.0	0.0	0.0	0.0	0.0	17.1	0.1	0.0	0.0	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	0.0	0.0	0.0	11.5	0.1	0.0	0.0	0.0	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	0.0	0.0	0.0	0.0	61.7	42.3	0.0	0.0	0.0	0.0	7.9
LnGrp LOS	B	A	A	A	A	E	D	A	A	A	A	A
Approach Vol, veh/h		1561			337			4				414
Approach Delay, s/veh		6.2			61.7			42.3				7.9
Approach LOS		A			E			D				A
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		96.0		24.0	65.0	31.0		24.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		91.5		19.5	60.5	26.5		19.5				
Max Q Clear Time (g_c+I1), s		2.0		8.0	47.3	22.8		2.2				
Green Ext Time (p_c), s		5.5		1.3	3.0	0.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay	14.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 1: Health Center Dr/Annrae St & Mesa College Dr

Ex + C PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	396	23	220	414	18	141	21	410	18	6	32
Future Volume (veh/h)	58	396	23	220	414	18	141	21	410	18	6	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	430	0	239	450	20	153	0	461	20	7	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	1133		311	1259	56	668	0	1189	67	10	51
Arrive On Green	0.05	0.32	0.00	0.09	0.36	0.36	0.37	0.00	0.37	0.04	0.04	0.04
Sat Flow, veh/h	1781	3554	1585	3456	3466	154	1781	0	3170	1781	271	1355
Grp Volume(v), veh/h	63	430	0	239	230	240	153	0	461	20	0	42
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1843	1781	0	1585	1781	0	1626
Q Serve(g_s), s	3.7	10.0	0.0	7.2	10.1	10.2	6.3	0.0	11.4	1.2	0.0	2.7
Cycle Q Clear(g_c), s	3.7	10.0	0.0	7.2	10.1	10.2	6.3	0.0	11.4	1.2	0.0	2.7
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		0.83
Lane Grp Cap(c), veh/h	81	1133		311	646	669	668	0	1189	67	0	61
V/C Ratio(X)	0.77	0.38		0.77	0.36	0.36	0.23	0.00	0.39	0.30	0.00	0.69
Avail Cap(c_a), veh/h	227	1133		601	650	674	668	0	1189	135	0	123
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.5	28.2	0.0	47.6	24.9	24.9	22.9	0.0	24.4	50.1	0.0	50.9
Incr Delay (d2), s/veh	5.8	1.0	0.0	3.0	0.5	0.5	0.8	0.0	1.0	0.9	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.4	0.0	3.2	4.3	4.5	2.8	0.0	4.4	0.5	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	29.2	0.0	50.5	25.5	25.5	23.7	0.0	25.4	51.0	0.0	55.9
LnGrp LOS	E	C		D	C	C	C	A	C	D	A	E
Approach Vol, veh/h		493	A		709			614				62
Approach Delay, s/veh		32.6			33.9			25.0				54.4
Approach LOS		C			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	39.0		8.9	9.3	43.8		45.0				
Change Period (Y+Rc), s	4.4	4.9		4.9	4.4	4.9		4.9				
Max Green Setting (Gmax), s	18.6	34.1		8.1	13.6	39.1		40.1				
Max Q Clear Time (g_c+I1), s	9.2	12.0		4.7	5.7	12.2		13.4				
Green Ext Time (p_c), s	0.4	4.9		0.0	0.0	4.7		1.3				

Intersection Summary

HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

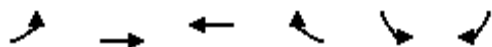
Notes

User approved volume balancing among the lanes for turning movement.  
 Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 2: Genesee Ave & SR-163 SB Off-Ramp

Ex + C PM  
01/17/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓↓	↓
Traffic Volume (veh/h)	0	808	756	0	286	463
Future Volume (veh/h)	0	808	756	0	286	463
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	878	822	0	271	545
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1901	1901	0	667	1186
Arrive On Green	0.00	0.54	0.54	0.00	0.37	0.37
Sat Flow, veh/h	0	3741	3741	0	1781	3170
Grp Volume(v), veh/h	0	878	822	0	271	545
Grp Sat Flow(s),veh/h/ln	0	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	18.3	16.8	0.0	13.5	15.6
Cycle Q Clear(g_c), s	0.0	18.3	16.8	0.0	13.5	15.6
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1901	1901	0	667	1186
V/C Ratio(X)	0.00	0.46	0.43	0.00	0.41	0.46
Avail Cap(c_a), veh/h	0	1901	1901	0	667	1186
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.94	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.2	16.9	0.0	27.7	28.4
Incr Delay (d2), s/veh	0.0	0.8	0.7	0.0	1.8	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.6	6.9	0.0	6.1	6.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.0	17.6	0.0	29.6	29.7
LnGrp LOS	A	B	B	A	C	C
Approach Vol, veh/h		878	822		816	
Approach Delay, s/veh		18.0	17.6		29.6	
Approach LOS		B	B		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		70.0		50.0		70.0
Change Period (Y+Rc), s		5.8		5.1		5.8
Max Green Setting (Gmax), s		64.2		44.9		64.2
Max Q Clear Time (g_c+I1), s		20.3		17.6		18.8
Green Ext Time (p_c), s		4.8		1.1		4.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.6			
HCM 6th LOS			C			

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Cardinal Rd/SR 163 NB ramps & Genesee Ave

Ex + C PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔			↕	↔
Traffic Volume (veh/h)	515	476	322	29	535	660	211	148	25	0	0	352
Future Volume (veh/h)	515	476	322	29	535	660	211	148	25	0	0	352
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	560	517	350	32	582	717	229	161	27	0	0	383
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	609	1099	743	146	1591	710	256	224	38	0	114	751
Arrive On Green	0.29	0.90	0.90	0.14	0.75	0.75	0.14	0.14	0.14	0.00	0.00	0.06
Sat Flow, veh/h	3456	2029	1372	1781	3554	1585	1781	1561	262	0	1870	3170
Grp Volume(v), veh/h	560	453	414	32	582	717	229	0	188	0	0	383
Grp Sat Flow(s),veh/h/ln	1728	1777	1623	1781	1777	1585	1781	0	1823	0	1870	1585
Q Serve(g_s), s	18.8	5.1	5.1	1.9	6.8	53.7	15.2	0.0	11.8	0.0	0.0	7.3
Cycle Q Clear(g_c), s	18.8	5.1	5.1	1.9	6.8	53.7	15.2	0.0	11.8	0.0	0.0	7.3
Prop In Lane	1.00		0.84	1.00		1.00	1.00		0.14	0.00		1.00
Lane Grp Cap(c), veh/h	609	963	880	146	1591	710	256	0	262	0	114	751
V/C Ratio(X)	0.92	0.47	0.47	0.22	0.37	1.01	0.89	0.00	0.72	0.00	0.00	0.51
Avail Cap(c_a), veh/h	680	963	880	224	1591	710	263	0	269	0	114	751
HCM Platoon Ratio	1.67	1.67	1.67	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.68	0.68	0.68	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	41.5	2.9	2.9	48.4	9.2	15.1	50.5	0.0	49.0	0.0	0.0	39.7
Incr Delay (d2), s/veh	14.7	1.5	1.6	0.2	0.0	30.5	28.5	0.0	7.4	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	1.6	1.5	0.9	2.2	16.1	8.8	0.0	5.9	0.0	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.3	4.3	4.5	48.6	9.3	45.6	78.9	0.0	56.4	0.0	0.0	40.0
LnGrp LOS	E	A	A	D	A	F	E	A	E	A	A	D
Approach Vol, veh/h		1427			1331			417				383
Approach Delay, s/veh		24.8			29.8			68.8				40.0
Approach LOS		C			C			E				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	71.5		12.0	25.8	60.2		21.9				
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	* 6.5		4.7				
Max Green Setting (Gmax), s	* 15	59.3		* 7.3	* 24	* 52		17.7				
Max Q Clear Time (g_c+I1), s	3.9	7.1		9.3	20.8	55.7		17.2				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.3	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



HCM 6th Signalized Intersection Summary  
 4: Health Center Dr & Genesee Ave/Starling Dr

Ex + C PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↑↑			↵			↵			↕	↵
Traffic Volume (veh/h)	248	216	3	0	484	10	0	0	0	8	0	779
Future Volume (veh/h)	248	216	3	0	484	10	0	0	0	8	0	779
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	270	235	3	0	526	11	0	0	0	0	0	857
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	0	2	2	2	2	2
Cap, veh/h	334	2081	27	0	646	14	0	647	0	0	647	1691
Arrive On Green	0.19	0.58	0.58	0.00	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.35
Sat Flow, veh/h	1781	3593	46	0	1825	38	0	1870	0	0	1870	3170
Grp Volume(v), veh/h	270	116	122	0	0	537	0	0	0	0	0	857
Grp Sat Flow(s),veh/h/ln	1781	1777	1862	0	0	1863	0	1870	0	0	1870	1585
Q Serve(g_s), s	17.4	3.5	3.5	0.0	0.0	31.4	0.0	0.0	0.0	0.0	0.0	20.7
Cycle Q Clear(g_c), s	17.4	3.5	3.5	0.0	0.0	31.4	0.0	0.0	0.0	0.0	0.0	20.7
Prop In Lane	1.00		0.02	0.00		0.02	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	334	1029	1078	0	0	660	0	647	0	0	647	1691
V/C Ratio(X)	0.81	0.11	0.11	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.51
Avail Cap(c_a), veh/h	334	1029	1078	0	0	660	0	647	0	0	647	1691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	46.7	11.4	11.4	0.0	0.0	35.2	0.0	0.0	0.0	0.0	0.0	17.9
Incr Delay (d2), s/veh	17.1	0.2	0.2	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	1.5	1.5	0.0	0.0	16.2	0.0	0.0	0.0	0.0	0.0	21.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.8	11.6	11.6	0.0	0.0	45.7	0.0	0.0	0.0	0.0	0.0	19.0
LnGrp LOS	E	B	B	A	A	D	A	A	A	A	A	B
Approach Vol, veh/h		508			537			0				857
Approach Delay, s/veh		39.3			45.7			0.0				19.0
Approach LOS		D			D							B
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		74.0		46.0	27.0	47.0		46.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		69.5		41.5	22.5	42.5		41.5				
Max Q Clear Time (g_c+I1), s		5.5		22.7	19.4	33.4		0.0				
Green Ext Time (p_c), s		1.6		3.7	0.3	2.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

# **ATTACHMENT E**

## **PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – OPENING YEAR + PROJECT**

HCM 6th Signalized Intersection Summary  
 1: Health Center Dr/Annrae St & Mesa College Dr

Ex + C + P AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑		↘	↗	↗	↘	↗	
Traffic Volume (veh/h)	26	643	210	697	483	20	44	2	122	27	27	44
Future Volume (veh/h)	26	643	210	697	483	20	44	2	122	27	27	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	699	0	758	525	22	48	0	134	29	29	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	930		815	1659	69	505	0	898	107	38	63
Arrive On Green	0.02	0.26	0.00	0.24	0.48	0.48	0.28	0.00	0.28	0.06	0.06	0.06
Sat Flow, veh/h	1781	3554	1585	3456	3476	145	1781	0	3170	1781	633	1048
Grp Volume(v), veh/h	28	699	0	758	268	279	48	0	134	29	0	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1844	1781	0	1585	1781	0	1682
Q Serve(g_s), s	1.9	21.7	0.0	25.8	11.1	11.2	2.4	0.0	3.8	1.9	0.0	5.4
Cycle Q Clear(g_c), s	1.9	21.7	0.0	25.8	11.1	11.2	2.4	0.0	3.8	1.9	0.0	5.4
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	36	930		815	848	880	505	0	898	107	0	101
V/C Ratio(X)	0.78	0.75		0.93	0.32	0.32	0.10	0.00	0.15	0.27	0.00	0.76
Avail Cap(c_a), veh/h	92	930		852	848	880	505	0	898	113	0	107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.5	40.7	0.0	44.9	19.3	19.3	31.7	0.0	32.2	53.9	0.0	55.6
Incr Delay (d2), s/veh	12.4	5.6	0.0	15.9	0.3	0.3	0.4	0.0	0.4	0.5	0.0	23.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.2	0.0	12.8	4.7	4.9	1.1	0.0	1.5	0.9	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	46.3	0.0	60.7	19.7	19.7	32.0	0.0	32.5	54.4	0.0	78.7
LnGrp LOS	E	D		E	B	B	C	A	C	D	A	E
Approach Vol, veh/h		727	A		1305			182			106	
Approach Delay, s/veh		47.3			43.5			32.4			72.1	
Approach LOS		D			D			C			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.7	36.3		12.1	6.8	62.2		38.9				
Change Period (Y+Rc), s	4.4	4.9		4.9	4.4	4.9		4.9				
Max Green Setting (Gmax), s	29.6	29.7		7.6	6.2	53.1		34.0				
Max Q Clear Time (g_c+I1), s	27.8	23.7		7.4	3.9	13.2		5.8				
Green Ext Time (p_c), s	0.5	3.4		0.0	0.0	6.2		0.3				

Intersection Summary

HCM 6th Ctrl Delay	45.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.  
 Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary  
 2: Genesee Ave & SR-163 SB Off-Ramp

Ex + C + P AM  
 01/17/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓↓	↓
Traffic Volume (veh/h)	0	611	499	0	752	350
Future Volume (veh/h)	0	611	499	0	752	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	984	984	0	984	984
Adj Flow Rate, veh/h	0	664	542	0	817	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	782	782	0	920	409
Arrive On Green	0.00	0.42	0.42	0.00	0.49	0.49
Sat Flow, veh/h	0	1969	1969	0	1875	834
Grp Volume(v), veh/h	0	664	542	0	817	380
Grp Sat Flow(s),veh/h/ln	0	935	935	0	938	834
Q Serve(g_s), s	0.0	38.4	28.5	0.0	47.2	51.1
Cycle Q Clear(g_c), s	0.0	38.4	28.5	0.0	47.2	51.1
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	782	782	0	920	409
V/C Ratio(X)	0.00	0.85	0.69	0.00	0.89	0.93
Avail Cap(c_a), veh/h	0	782	782	0	920	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.97	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	31.5	28.6	0.0	27.6	28.6
Incr Delay (d2), s/veh	0.0	11.1	4.9	0.0	12.4	29.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	6.8	0.0	11.8	13.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	42.6	33.4	0.0	40.0	58.2
LnGrp LOS	A	D	C	A	D	E
Approach Vol, veh/h		664	542		1197	
Approach Delay, s/veh		42.6	33.4		45.8	
Approach LOS		D	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		56.0		64.0		56.0
Change Period (Y+Rc), s		5.8		5.1		5.8
Max Green Setting (Gmax), s		50.2		58.9		50.2
Max Q Clear Time (g_c+I1), s		40.4		53.1		30.5
Green Ext Time (p_c), s		2.3		1.1		2.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			42.1			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 3: Cardinal Rd/SR 163 NB ramps & Genesee Ave

Ex + C + P AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔			↔	↔
Traffic Volume (veh/h)	521	1492	315	53	352	360	228	216	22	0	0	337
Future Volume (veh/h)	521	1492	315	53	352	360	228	216	22	0	0	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	566	1622	342	58	383	391	248	235	24	0	0	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	616	1553	316	190	1623	724	246	256	26	0	89	716
Arrive On Green	0.36	1.00	1.00	0.04	0.15	0.15	0.15	0.15	0.15	0.00	0.00	0.05
Sat Flow, veh/h	3456	2941	599	1781	3554	1585	1687	1757	181	0	1870	3170
Grp Volume(v), veh/h	566	957	1007	58	383	391	263	0	244	0	0	366
Grp Sat Flow(s),veh/h/ln	1728	1777	1763	1781	1777	1585	1786	0	1838	0	1870	1585
Q Serve(g_s), s	18.8	0.0	61.6	3.8	11.4	27.4	17.5	0.0	15.7	0.0	0.0	5.7
Cycle Q Clear(g_c), s	18.8	0.0	61.6	3.8	11.4	27.4	17.5	0.0	15.7	0.0	0.0	5.7
Prop In Lane	1.00		0.34	1.00		1.00	0.94		0.10	0.00		1.00
Lane Grp Cap(c), veh/h	616	938	931	190	1623	724	260	0	268	0	89	716
V/C Ratio(X)	0.92	1.02	1.08	0.30	0.24	0.54	1.01	0.00	0.91	0.00	0.00	0.51
Avail Cap(c_a), veh/h	815	938	931	224	1623	724	260	0	268	0	89	716
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.28	0.28	0.28	0.80	0.80	0.80	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	37.8	0.0	0.0	53.5	32.5	39.3	51.3	0.0	50.5	0.0	0.0	40.7
Incr Delay (d2), s/veh	3.7	20.8	43.0	0.3	0.0	0.4	57.9	0.0	32.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	5.4	11.1	1.8	5.4	11.7	12.0	0.0	9.6	0.0	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	20.8	43.0	53.8	32.5	39.7	109.2	0.0	82.6	0.0	0.0	40.9
LnGrp LOS	D	F	F	D	C	D	F	A	F	A	A	D
Approach Vol, veh/h		2530			832			507				366
Approach Delay, s/veh		34.3			37.4			96.4				40.9
Approach LOS		C			D			F				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	69.9		10.4	26.1	61.3		22.2				
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	* 6.5		4.7				
Max Green Setting (Gmax), s	* 15	61.1		* 5.7	* 28	* 49		17.5				
Max Q Clear Time (g_c+I1), s	5.8	63.6		7.7	20.8	29.4		19.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.6	2.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay	42.9
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
 4: Health Center Dr & Genesee Ave/Starling Dr

Ex + C + P AM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	811	669	1	0	278	20	2	0	2	10	0	354
Future Volume (veh/h)	811	669	1	0	278	20	2	0	2	10	0	354
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	882	727	1	0	302	22	2	0	2	0	0	397
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	898	2776	4	0	380	28	134	14	103	0	304	2113
Arrive On Green	0.84	1.00	1.00	0.00	0.22	0.22	0.16	0.00	0.16	0.00	0.00	0.16
Sat Flow, veh/h	1781	3641	5	0	1722	125	546	88	634	0	1870	3170
Grp Volume(v), veh/h	882	355	373	0	0	324	4	0	0	0	0	397
Grp Sat Flow(s),veh/h/ln	1781	1777	1869	0	0	1848	1268	0	0	0	1870	1585
Q Serve(g_s), s	54.2	0.0	0.0	0.0	0.0	19.9	0.0	0.0	0.0	0.0	0.0	5.7
Cycle Q Clear(g_c), s	54.2	0.0	0.0	0.0	0.0	19.9	0.2	0.0	0.0	0.0	0.0	5.7
Prop In Lane	1.00		0.00	0.00		0.07	0.50		0.50	0.00		1.00
Lane Grp Cap(c), veh/h	898	1355	1425	0	0	408	251	0	0	0	304	2113
V/C Ratio(X)	0.98	0.26	0.26	0.00	0.00	0.79	0.02	0.00	0.00	0.00	0.00	0.19
Avail Cap(c_a), veh/h	898	1355	1425	0	0	408	251	0	0	0	304	2113
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	0.0	0.0	0.0	0.0	44.2	42.2	0.0	0.0	0.0	0.0	7.6
Incr Delay (d2), s/veh	5.8	0.0	0.0	0.0	0.0	14.7	0.1	0.0	0.0	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	0.0	0.0	0.0	10.8	0.1	0.0	0.0	0.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	0.0	0.0	0.0	0.0	58.9	42.3	0.0	0.0	0.0	0.0	7.8
LnGrp LOS	B	A	A	A	A	E	D	A	A	A	A	A
Approach Vol, veh/h		1610			324			4				397
Approach Delay, s/veh		8.1			58.9			42.3				7.8
Approach LOS		A			E			D				A
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		96.0		24.0	65.0	31.0		24.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		91.5		19.5	60.5	26.5		19.5				
Max Q Clear Time (g_c+I1), s		2.0		7.7	56.2	21.9		2.2				
Green Ext Time (p_c), s		5.7		1.3	1.6	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary  
 1: Health Center Dr/Annrae St & Mesa College Dr

Ex + C + P PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑	↖	↗↖	↑↑		↗	↖	↗	↖	↖	↖
Traffic Volume (veh/h)	58	396	19	220	414	18	146	21	410	18	6	32
Future Volume (veh/h)	58	396	19	220	414	18	146	21	410	18	6	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	430	0	239	450	20	159	0	461	20	7	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	1154		311	1279	57	661	0	1177	67	10	51
Arrive On Green	0.05	0.32	0.00	0.09	0.37	0.37	0.37	0.00	0.37	0.04	0.04	0.04
Sat Flow, veh/h	1781	3554	1585	3456	3466	154	1781	0	3170	1781	271	1355
Grp Volume(v), veh/h	63	430	0	239	230	240	159	0	461	20	0	42
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1843	1781	0	1585	1781	0	1626
Q Serve(g_s), s	3.8	10.0	0.0	7.3	10.1	10.2	6.7	0.0	11.6	1.2	0.0	2.8
Cycle Q Clear(g_c), s	3.8	10.0	0.0	7.3	10.1	10.2	6.7	0.0	11.6	1.2	0.0	2.8
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		0.83
Lane Grp Cap(c), veh/h	81	1154		311	656	680	661	0	1177	67	0	61
V/C Ratio(X)	0.77	0.37		0.77	0.35	0.35	0.24	0.00	0.39	0.30	0.00	0.69
Avail Cap(c_a), veh/h	224	1154		595	659	684	661	0	1177	117	0	107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	28.0	0.0	48.1	24.7	24.7	23.5	0.0	25.0	50.6	0.0	51.4
Incr Delay (d2), s/veh	5.8	0.9	0.0	3.0	0.5	0.5	0.9	0.0	1.0	0.9	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.4	0.0	3.3	4.3	4.5	2.9	0.0	4.5	0.5	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.8	28.9	0.0	51.1	25.2	25.2	24.3	0.0	26.0	51.6	0.0	56.5
LnGrp LOS	E	C		D	C	C	C	A	C	D	A	E
Approach Vol, veh/h		493	A		709			620				62
Approach Delay, s/veh		32.5			33.9			25.6				54.9
Approach LOS		C			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.1	40.0		8.9	9.3	44.8		45.0				
Change Period (Y+Rc), s	4.4	4.9		4.9	4.4	4.9		4.9				
Max Green Setting (Gmax), s	18.6	35.1		7.1	13.6	40.1		40.1				
Max Q Clear Time (g_c+I1), s	9.3	12.0		4.8	5.8	12.2		13.6				
Green Ext Time (p_c), s	0.4	5.0		0.0	0.0	4.8		1.3				

Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary  
 2: Genesee Ave & SR-163 SB Off-Ramp

Ex + C + P PM  
 01/17/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓↓	↓
Traffic Volume (veh/h)	0	805	759	0	281	463
Future Volume (veh/h)	0	805	759	0	281	463
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	875	825	0	269	541
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1872	1872	0	681	1213
Arrive On Green	0.00	0.53	0.53	0.00	0.38	0.38
Sat Flow, veh/h	0	3741	3741	0	1781	3170
Grp Volume(v), veh/h	0	875	825	0	269	541
Grp Sat Flow(s),veh/h/ln	0	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	18.6	17.2	0.0	13.2	15.2
Cycle Q Clear(g_c), s	0.0	18.6	17.2	0.0	13.2	15.2
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1872	1872	0	681	1213
V/C Ratio(X)	0.00	0.47	0.44	0.00	0.39	0.45
Avail Cap(c_a), veh/h	0	1872	1872	0	681	1213
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.93	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	17.5	0.0	26.9	27.6
Incr Delay (d2), s/veh	0.0	0.8	0.7	0.0	1.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.7	7.1	0.0	5.9	6.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.7	18.2	0.0	28.7	28.8
LnGrp LOS	A	B	B	A	C	C
Approach Vol, veh/h		875	825		810	
Approach Delay, s/veh		18.7	18.2		28.7	
Approach LOS		B	B		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		69.0		51.0		69.0
Change Period (Y+Rc), s		5.8		5.1		5.8
Max Green Setting (Gmax), s		63.2		45.9		63.2
Max Q Clear Time (g_c+I1), s		20.6		17.2		19.2
Green Ext Time (p_c), s		4.8		1.1		4.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.8			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.



HCM 6th Signalized Intersection Summary  
 3: Cardinal Rd/SR 163 NB ramps & Genesee Ave

Ex + C + P PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔		↕↔			↔	↔
Traffic Volume (veh/h)	515	458	322	29	550	666	211	148	25	0	0	352
Future Volume (veh/h)	515	458	322	29	550	666	211	148	25	0	0	352
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	560	498	350	32	598	724	229	161	27	0	0	383
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	609	1081	758	146	1591	710	256	224	38	0	114	751
Arrive On Green	0.29	0.90	0.90	0.14	0.75	0.75	0.14	0.14	0.14	0.00	0.00	0.06
Sat Flow, veh/h	3456	1996	1400	1781	3554	1585	1781	1561	262	0	1870	3170
Grp Volume(v), veh/h	560	443	405	32	598	724	229	0	188	0	0	383
Grp Sat Flow(s),veh/h/ln	1728	1777	1618	1781	1777	1585	1781	0	1823	0	1870	1585
Q Serve(g_s), s	18.8	4.9	4.9	1.9	7.1	53.7	15.2	0.0	11.8	0.0	0.0	7.3
Cycle Q Clear(g_c), s	18.8	4.9	4.9	1.9	7.1	53.7	15.2	0.0	11.8	0.0	0.0	7.3
Prop In Lane	1.00		0.86	1.00		1.00	1.00		0.14	0.00		1.00
Lane Grp Cap(c), veh/h	609	963	877	146	1591	710	256	0	262	0	114	751
V/C Ratio(X)	0.92	0.46	0.46	0.22	0.38	1.02	0.89	0.00	0.72	0.00	0.00	0.51
Avail Cap(c_a), veh/h	680	963	877	224	1591	710	263	0	269	0	114	751
HCM Platoon Ratio	1.67	1.67	1.67	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.66	0.66	0.66	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	41.5	2.9	2.9	48.4	9.3	15.1	50.5	0.0	49.0	0.0	0.0	39.7
Incr Delay (d2), s/veh	14.6	1.4	1.6	0.2	0.0	32.7	28.5	0.0	7.4	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	1.6	1.5	0.9	2.3	16.5	8.8	0.0	5.9	0.0	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	4.3	4.4	48.6	9.3	47.8	78.9	0.0	56.4	0.0	0.0	40.0
LnGrp LOS	E	A	A	D	A	F	E	A	E	A	A	D
Approach Vol, veh/h		1408			1354			417				383
Approach Delay, s/veh		24.9			30.8			68.8				40.0
Approach LOS		C			C			E				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	71.5		12.0	25.8	60.2		21.9				
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	* 6.5		4.7				
Max Green Setting (Gmax), s	* 15	59.3		* 7.3	* 24	* 52		17.7				
Max Q Clear Time (g_c+I1), s	3.9	6.9		9.3	20.8	55.7		17.2				
Green Ext Time (p_c), s	0.0	4.5		0.0	0.3	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
 4: Health Center Dr & Genesee Ave/Starling Dr

Ex + C + P PM  
 01/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑			↖			↖			↕	↗
Traffic Volume (veh/h)	238	208	3	0	493	10	0	0	0	8	0	791
Future Volume (veh/h)	238	208	3	0	493	10	0	0	0	8	0	791
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	259	226	3	0	536	11	0	0	0	0	0	870
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	0	2	2	2	2	2
Cap, veh/h	334	2050	27	0	632	13	0	662	0	0	662	1717
Arrive On Green	0.19	0.57	0.57	0.00	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.35
Sat Flow, veh/h	1781	3591	48	0	1826	37	0	1870	0	0	1870	3170
Grp Volume(v), veh/h	259	112	117	0	0	547	0	0	0	0	0	870
Grp Sat Flow(s),veh/h/ln	1781	1777	1862	0	0	1864	0	1870	0	0	1870	1585
Q Serve(g_s), s	16.6	3.5	3.5	0.0	0.0	32.6	0.0	0.0	0.0	0.0	0.0	20.8
Cycle Q Clear(g_c), s	16.6	3.5	3.5	0.0	0.0	32.6	0.0	0.0	0.0	0.0	0.0	20.8
Prop In Lane	1.00		0.03	0.00		0.02	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	334	1014	1063	0	0	644	0	662	0	0	662	1717
V/C Ratio(X)	0.78	0.11	0.11	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.51
Avail Cap(c_a), veh/h	334	1014	1063	0	0	644	0	662	0	0	662	1717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	46.3	11.8	11.8	0.0	0.0	36.3	0.0	0.0	0.0	0.0	0.0	17.4
Incr Delay (d2), s/veh	14.8	0.2	0.2	0.0	0.0	13.1	0.0	0.0	0.0	0.0	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	1.4	1.5	0.0	0.0	17.2	0.0	0.0	0.0	0.0	0.0	21.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	12.0	12.0	0.0	0.0	49.5	0.0	0.0	0.0	0.0	0.0	18.4
LnGrp LOS	E	B	B	A	A	D	A	A	A	A	A	B
Approach Vol, veh/h		488			547			0				870
Approach Delay, s/veh		38.1			49.5			0.0				18.4
Approach LOS		D			D							B
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		73.0		47.0	27.0	46.0		47.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		68.5		42.5	22.5	41.5		42.5				
Max Q Clear Time (g_c+I1), s		5.5		22.8	18.6	34.6		0.0				
Green Ext Time (p_c), s		1.5		3.8	0.3	2.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

**ATTACHMENT F**  
**LONG RANGE PLAN FOR EXPANSION AND IMPROVEMENT**  
**COVER PAGE**

# Long Range Plan for Expansion and Improvement (LRPEI)

## For:

Children's Hospital and Health Center, Sharp  
HealthCare/Sharp Memorial Hospital & San Diego Medical  
Center

## Attachments

1. LRPEI Agreement, December 1995
2. LRPEI, December 1994
3. MCUP Agreement, March 1993
4. CUP Amendment No 11504 v PDP 11505 2004
5. CUP 392017 PDP 392016 Parking 2007