FINAL TRAFFIC OPERATIONS ANALYSIS REPORT

# I-80 / Hiddenbrooke / American Canyon Interchange

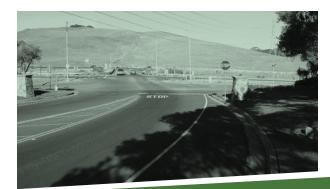
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### Table of Contents

Chapter 1.	Introduction	
Report Pu	urpose	1
Project Ba	ackground	1
Project De	escription	2
Project Al	Iternatives	2
Chapter 2.	Analysis Methodology	3
Study Are	ea	3
Data Colle	ection	5
2024 Ope	ening Year Travel Demand Forecasts	8
Traffic Op	perations Analysis	8
Stop-	Controlled and Signalized Intersections	8
Simul	lation Model Development	9
Roun	dabout Analysis	11
Freew	vay Analysis	11
LOS Stand	dards	13
Chapter 3.	Existing Conditions	14
Description	on of Study Facilities	14
Intersection	on Operations	16
Freeway C	Operations	18
Roadway	Safety	19
Multimod	dal Facilities	20
Chapter 4.	Opening Year 2024	21
2024 Ope	ening Year Forecasts	21
2024 No I	Project Conditions	23
Inters	section Operations	23
Freew	vay Operations	25
Chapter 5.	Intersection Control Evaluation	26
Description	on of Traffic Control Alternatives	26
2024 Con	ditions with Traffic Signals and Ramp Widening	26
2024 Con	ditions with Roundabouts	28

Chapter 6.	VMT Assessment	29
Chapter 7.	Conclusions	30

### Appendices

Appendix A:Roundabout Validation Report

Appendix B: Counts

Appendix C:Model Outputs

Appendix D:Hiddenbrooke Trip Generation

Appendix E: SimTraffic and HCS Outputs

### List of Figures

Figure 1. Study Area	4
Figure 2. Signalized Intersection Configuration	6
Figure 3. Roundabout Configuration	7
Figure 4. Peak Hour Traffic Volumes – Existing Conditions	15
Figure 5. Peak Hour Traffic Volumes - 2024 Opening Year	22
List of Tables	
Table 1. Intersection LOS Thresholds	
Table 2. Freeway LOS Thresholds	12
Table 3. I-80 Mainline Peak Hour Volumes – Existing Conditions	16
Table 4. Intersection Operations - Existing Conditions	16
Table 5. Average Maximum Queue Length – Existing Conditions	17
Table 6. Freeway Operations – Existing Conditions	18
Table 7. Collision History – American Canyon Road / Hiddenbrooke Parkway	19
Table 8. Collision History – I-80 Mainline and Ramps	20
Table 9. I-80 Mainline Peak Hour Volumes – 2024 Opening Year Conditions	21
Table 10. Intersection Operations – 2024 No Project Conditions	23
Table 11. Average Maximum Queue Length – 2024 No Project Conditions	24
Table 12. Freeway Operations – 2024 Conditions	25
Table 13. Intersection Operations – 2024 with Traffic Signals Conditions	27
Table 14. Average Maximum Queue Length – 2024 with Traffic Signals Conditions	27
Table 15. Intersection Operations – 2024 with Roundabout Conditions	28

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### Chapter 1. Introduction

The primary goal of the I-80/Hiddenbrooke Parkway Interchange Operational Improvements Project (Project) is to improve local street traffic operations in conjunction with build-out of the Hiddenbrooke Community. The improvements involve conversion of existing interchange access and frontage road intersections along Hiddenbrooke Parkway from side-street stop control to roundabouts.

### **Report Purpose**

The purpose of this report is to present existing and opening year (2024) conditions of the interchange access intersections. It describes the existing transportation infrastructure, including the roadway system, and bicycle and pedestrian facilities. The existing operational characteristics are described, as well as methods used to evaluate intersection conditions. This report also presents opening year conditions with and without the project. Finally, the report evaluates both roundabout and traffic signal control alternatives for the interchange access intersections. The results in this report serve as the basis for the traffic operations section of the Permit Engineering Evaluation Report (PEER).

### **Project Background**

Development of the Hiddenbrooke Community began with the designation of Sky Valley (now known as Hiddenbrooke) as a specific planning area by the City of Vallejo Planning Commission in August 1985. A Draft Specific Area Plan (SAP), prepared in March 1986, served as the subject for an environmental review that resulted in the Sky Valley Draft Environmental Impact Report dated May 1986. After receiving public comment, a revised Draft SAP was developed, a revised Draft EIR was prepared, and a Final EIR was certified on April 28, 1987.

As part of the original planning and environmental process described above for the Hiddenbrooke Community, traffic studies were prepared that indicated the need for improvements to the I-80/Hiddenbrooke Parkway - American Canyon Road interchange upon build-out of the Hiddenbrooke community. The City and developer of the Hiddenbrooke community executed an agreement for improvements to the interchange. The City of Vallejo collected fees to make improvements to the interchange. Traffic studies conducted in recent years indicate the interchange access intersections would operate at LOS F conditions by 2035 if improvements are not made.

After years of extensive community engagement with the Hiddenbrooke community that included three community workshops and a mail-in community survey conducted by the Hiddenbrooke Property Owners Association (HPOA), roundabouts were identified as the preferred improvement option for the interchange by Hiddenbrooke community residents. On September 11, 2018, the Vallejo City Council approved roundabouts as the preferred alternative and directed City staff to proceed with project implementation.



### **Project Description**

The purpose of the project is to accomplish the following specific objectives:

- Relieve congestion and improve the flow of traffic on Hiddenbrooke Parkway
- Provide for safe and reliable operation of intersections at the I-80/Hiddenbrooke Parkway -American Canyon Road interchange
- Provide improvements consistent with local planning documents and state standards

The project would have two roundabouts, one at the I-80 westbound interchange access intersection and one at the I-80 eastbound interchange access intersection. The roundabout at the I-80 westbound interchange access intersection is a 4-leg roundabout comprised of the I-80 westbound ramps, Hiddenbrooke Parkway, and American Canyon Road legs. The roundabout at the I-80 eastbound interchange access intersection is a 6-leg roundabout that incorporates Hiddenbrooke Parkway, the I-80 eastbound ramps, and McGary Road. McGary Road is a frontage road that parallels I-80 and is located approximately 80 feet south of the I-80 eastbound interchange access intersection. This configuration of roundabouts is very similar to improvements planned for the I-80/Gilman Street interchange<sup>1</sup> in Berkeley.

A California Legal 65-foot semi-truck was used for the turning analysis in the preliminary design of the roundabouts on both sides of the interchange.

### **Project Alternatives**

**Chapter 5** provides an evaluation of alternative intersection control options for the project. Alternatives that are evaluated include installing roundabouts or widening the intersections and installing traffic signals. The roundabout evaluation was performed by Reid Middleton and the traffic signal evaluation was performed by Fehr & Peers.

<sup>&</sup>lt;sup>1</sup> Project Study Report-Project Development Support (PSR-PDS) for I-80 at Gilman Street Interchange, Caltrans District 4, September 2, 2014.



## Chapter 2. Analysis Methodology

This chapter describes the study area and the methods used to analyze the transportation facilities.

### **Study Area**

The transportation analysis study area is divided into a local street network and a freeway network. The local street network extends along American Canyon Road from the I-80 westbound ramps to McGary Road. The freeway network extends along I-80 just to the east and west of American Canyon. **Figure 1** shows the intersections, and freeway segments in the study area.

The study intersections are listed below.

- 1. Hiddenbrooke Parkway-American Canyon Road / I-80 Westbound Ramps
- 2. Hiddenbrooke Parkway-American Canyon Road / I-80 Eastbound Ramps
- 3. Hiddenbrooke Parkway / McGary Road

The freeway study segments are listed below.

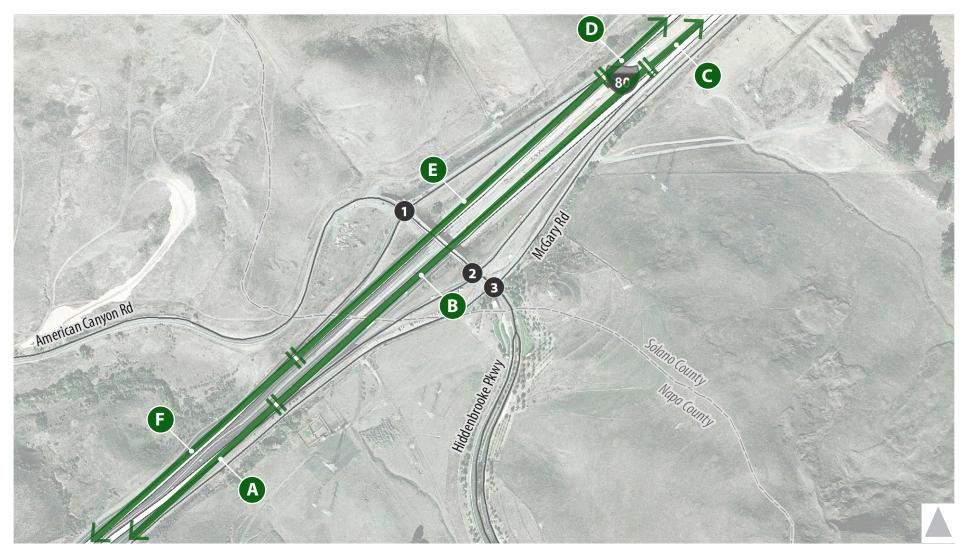
#### Eastbound I-80

#### Westbound I-80

- A. American Canyon Road Off-Ramp
- B. American Canyon Road Off- to On-Ramp
- C. American Canyon Road On-Ramp
- D. American Canyon Road Off-Ramp
- E. American Canyon Road Off- to On-Ramp
- F. American Canyon Road On-Ramp

No new study intersections or freeway study segments are added under the analysis of Construction Year Conditions. The study intersections geometry and intersection control are modified under the Build Alternatives, as described in detail later in this report. No changes are planned for the freeway study segments along I-80 under the Build Alternatives or under future analysis years.





### **Study Intersections**

- American Canyon Road / I-80 Westbound Ramps
- American Canyon Road / I-80 Eastbound Ramps
- Hiddenbrooke Parkway / McGary Road

### Eastbound I-80

- A American Canyon Road Off-Ramp
- B American Canyon Road Off- to On-Ramp
- American Canyon Road On-Ramp

### Westbound I-80

- American Canyon Road Off-Ramp
- American Canyon Road Off- to On-Ramp
- American Canyon Road On-Ramp



Figure 1

### **Data Collection**

Intersection turning movement counts were collected between 7:00 to 9:00 AM and 4:00 to 6:00 PM on Wednesday, March 11, 2020. The peak period counts included heavy vehicles, bicycles, and pedestrians. In addition, 24-hour roadway counts were collected on American Canyon Road north of I-80, Hiddenbrooke Parkway south of I-80, and McGary Road east of Hiddenbrooke Parkway. 2020 counts were compared to previously collected counts from 2015 to ensure that 2020 counts were not underrepresented due to the six-county Bay Area's shelter in place order which took effect March 16, 2020. As in 2015, the peak hours based on intersection counts are between 7:30 to 8:30 AM and 4:45 to 5:45 PM. With the exception of vehicles traveling to or from the Hiddenbrooke neighborhood to the south and the park-and-ride facility on McGary Road (open in 2015 but closed in 2020), counts taken in 2020 were similar or higher than those conducted in 2015. Intersection turning movement counts are summarized in **Appendix B**.

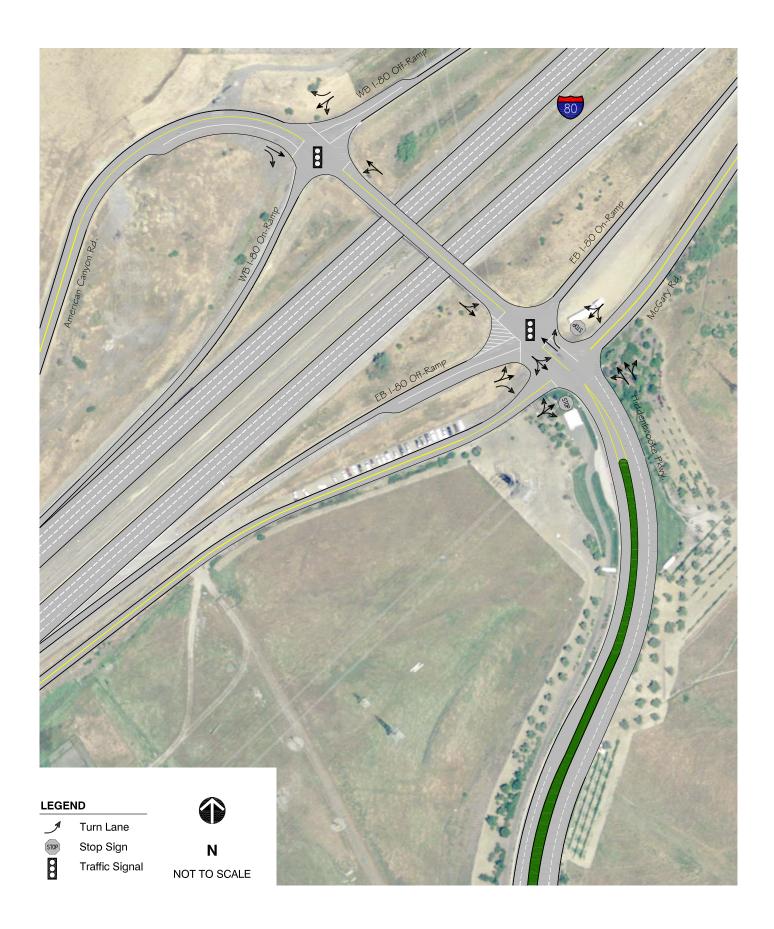
The network-wide peak hour factors were 0.93 and 0.98 during the morning and evening peak hours. The average network heavy vehicle percentages were 3 and 1 percent during the morning and evening peak hours, respectively.

Existing lane configurations, turn pocket lengths, intersection spacing, and posted speed limits were confirmed in the field. The intersection and roadway configuration for the Build Alternatives was provided by Mark Thomas and are shown in **Figure 2** and **Figure 3**.

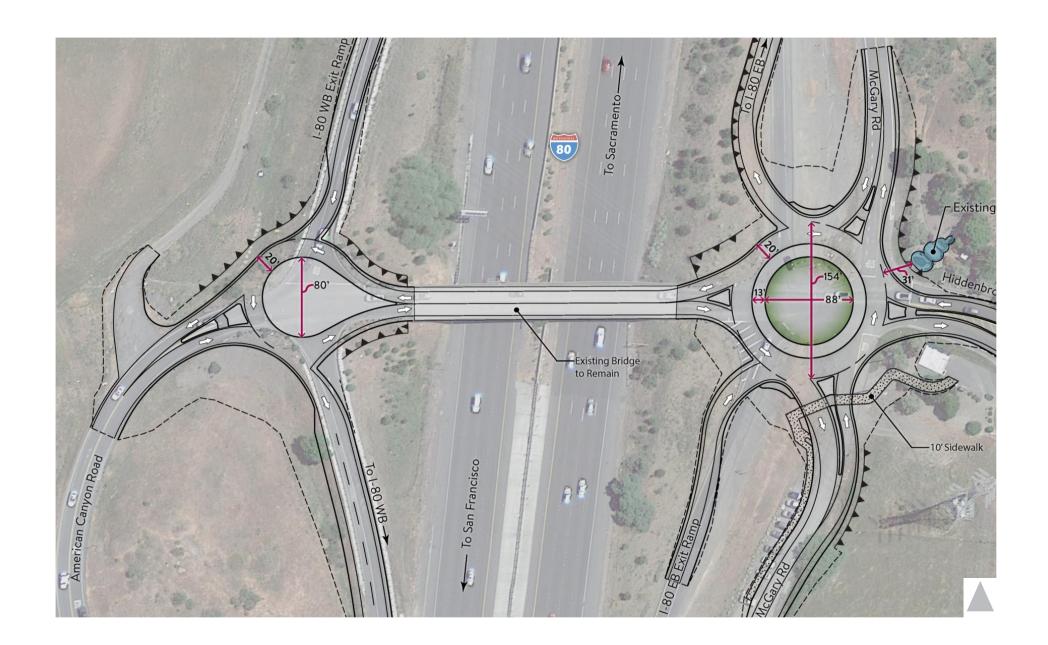
Freeway mainline volumes were obtained from the Caltrans Performance Measurement System (PeMS). The data were averaged across midweek weekdays (Tuesdays, Wednesdays, and Thursdays) during February 2020. The morning peak hour occurred from 8:00 to 9:00 AM, and the evening peak hour occurred from 5:00 to 6:00 PM. The freeway mainline peak hour factors were derived from PeMS data while ramp peak hour factors were derived from existing turning movement counts at the ramp intersections. Mainline peak hour heavy vehicle percentages were assumed to be the same as the daily percentage of 6 percent as reported in the Caltrans Annual Average Daily Truck Traffic publication<sup>2</sup>. Ramp heavy vehicle percentages were also based on existing turning movement counts at ramp intersections.

<sup>&</sup>lt;sup>2</sup> Caltrans 2018 Annual Average Daily Truck Traffic. Downloaded by Fehr & Peers June 2020. https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/census/aadt/2018-truck-aadt-a11y.xlsx











### 2024 Opening Year Travel Demand Forecasts

The methodology for developing intersection and ramp forecasts for the 2024 opening year scenario is summarized below.

- The 2024 forecasts are developed by adding the growth in traffic at the three study intersections, between 2020 and 2024, to traffic counts collected in 2020.
- To identify the growth in traffic to 2024, the growth in trips through 2040 was identified using the
  most recent version of the Napa-Solano travel demand model. Model outputs are provided in
  Appendix C.
- Since the Napa-Solano travel demand model does not include trips from the recently approved Watson Ranch Specific Plan (WRSP) in American Canyon that would add trips to the interchange, the estimated trips generated by WRSP were added to the 2040 forecasts.
- The increment of growth from the American Canyon Road leg (i.e., north side) of the interchange, to 2024, was determined by estimating the proportional rate of growth over four years by pivoting from the 2020 counts and 2040 forecasts.
- The 2024 forecasts assume all of the remaining residential growth in the Hiddenbrooke community would be completed by 2024, and those trips represent the increment of growth from the Hiddenbrooke Parkway leg (i.e., south side) of the intersection by 2024. Hiddenbrooke trip generation is summarized in **Appendix D**.

The methodology for developing freeway mainline forecasts for the 2024 opening year scenario is summarized below.

- The 2024 forecasts are developed by adding the growth in traffic at the six freeway mainline segments, between 2020 and 2024, to the 2020 PeMS mainline volumes.
- To identify the growth in traffic to 2024, the mainline growth through 2040 was identified using the most recent version of the Napa-Solano travel demand model.
- The increment of mainline growth to 2024, was determined by estimating the proportional rate of growth over four years by pivoting from the 2020 PeMS data and 2040 forecasts.

### **Traffic Operations Analysis**

### **Stop-Controlled and Signalized Intersections**

The study intersections were analyzed using the performance measures of intersection delay and level of service (LOS). LOS is a qualitative measure of traffic operating conditions that assigns a letter rating, from A (the best) to F (the worst). These ratings represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. The descriptions of letter ratings and the delay thresholds for signalized and unsignalized intersections are provided in **Table 1**. Although the HCM does not define the LOS delay thresholds for roundabouts, the thresholds for unsignalized intersections are assumed to



apply. For unsignalized intersections with some movements uncontrolled, the intersection LOS is determined by the controlled movement with the highest delay.

**Table 1. Intersection LOS Thresholds** 

		Delay <sup>1</sup>		
LOS	Description	Signalized	Unsignalized	
А	Operations with very low delay occurring with favorable progression and/or short cycle length.	<u>&lt;</u> 10	<u>&lt;</u> 10	
В	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 to 20	>10 to 15	
С	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 to 35	>15 to 25	
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 to 55	>25 to 35	
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55 to 80	>35 to 50	
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80 or v/c > 1 <sup>2</sup>	>50 or v/c > 1 <sup>2</sup>	

Notes:

Source: Highway Capacity Manual (Transportation Research Board, 2010)

Intersection operations were analyzed under AM and PM peak period conditions (7:00 to 9:00 AM and 4:00 to 6:00 PM) using the SimTraffic microsimulation software. Traffic simulation analysis allows for the direct modeling of vehicle interactions, delays due to queues that block turn pockets or adjacent lanes, and congestion that either constrains vehicles from reaching downstream intersections or causes queues that create additional delay at upstream intersections. The SimTraffic software was applied consistent with the methodology presented in the Highway Capacity Manual, 6th Edition (Transportation Research Board, 2016). The analysis results are an average of ten model runs using different random seed values. Intersection delay and LOS are based on the SimTraffic results.

#### **Simulation Model Development**

Development of the street network and traffic volumes that comprise the SimTraffic simulation models required the input of geometric, traffic control and traffic flow data, each of which is described in this section. An overview of the micro-simulation model development process is described below.



<sup>1.</sup> Delay is reported in seconds per vehicle.

<sup>2.</sup> Volume-to-capacity ratio is greater than 1 (demand exceeds capacity).

Roadway geometric data (traffic lanes, turn pockets, etc.) were gathered using aerial photographs and field observations. Lane configurations were initially taken from aerial photographs and were then confirmed or revised based on field observations.

The posted speed limits for streets in the study area were collected during field observations. Maximum vehicle speeds in the model are consistent with posted speed limits, although random speed variability is assigned to each vehicle, causing them to drive above or below the speed limit, to mimic prevailing driver behavior.

For each peak period, the analysis period is one hour with a 15-minute seeding period. The volume inputs vary each 15 minutes based on the traffic counts. The peak hour was determined based on the highest consecutive four 15-minute interval period based on the overall network volume. The routing decisions for the analysis period are based on the peak hour volumes. When developing the peak hour volumes, the volumes were balanced between intersections to reduce unexpected changes in through volumes between adjacent intersections. Where balancing was performed, the volumes were balanced to the higher volume to provide for a conservative analysis.

The SimTraffic models were validated to existing conditions using criteria developed by Fehr & Peers. A number of iterations were required to successively adjust the default simulation parameters for driver behavior until the model was validated to observed conditions.

Because micro-simulation models like SimTraffic rely on the random arrival of vehicles, multiple runs are needed to provide a reasonable level of statistical accuracy and validity. The models are run up to twenty times (each using a different random seed number). Starting with the first ten runs, runs that are clear outliers are reviewed to determine if coding errors are present. If no obvious error is found, the run is discarded and replaced with a subsequent run. This process is repeated until ten acceptable runs remain. The final results are based on an average of the ten acceptable runs.

During calibration of a microsimulation model, individual components are adjusted to match collected and field-observed data. Calibration of a model is necessary to ensure that the model provides a visually accurate depiction of the field-observed condition and that model outputs can be trusted to inform the best possible analysis.

Adjustments to the SimTraffic models focus on the model components related to driver behavior including yielding right-of-way at intersections, driver performance such as aggressiveness, vehicle fleet mix, and vehicle performance.

During validation, the SimTraffic model output is compared against field data to determine if the output is within acceptable levels. Specifically, the vehicles served on each intersection approach are compared to the counted volumes at the corresponding approach to ensure that modeled volumes are within five percent of counted demand volume. Additionally, modeled queue lengths are compared to observed queue lengths to ensure the model is accurately reflecting existing conditions.



#### **Roundabout Analysis**

Reid Middleton performed a quantitative delay and LOS analysis for the roundabout. The design vehicle movements (CA-Legal) were calculated with 6-in tire clearance to all mountable curbs, 12-in tire clearance to vertical curb and gutters and 0-in tire clearance to all truck apron curbs. In addition, an STAA-Standard truck, is accommodated on the on/off ramps of this interchange. Due to the conservative nature of AutoTURN, these offsets will ensure the design vehicle will easily negotiate the intersection. Limited pedestrian and bicycle facilities were provided in the current layout due to restrictions for these facilities across the bridge. A future layout showing the ultimate pedestrian and bicycle facilities is provided.

Roundabout operational analysis was performed using SIDRA, Version 8.0 and roundabout conceptual layout geometry used. Criteria LOS are the same as unsignalized intersections, as shown in **Table 1**. This analysis is for a 4-leg roundabout on the north side of the I-80/Hiddenbrooke Parkway interchange and a 6-leg roundabout on the south side of the interchange.

### **Freeway Analysis**

Freeway operations were analyzed under AM and PM peak hour conditions according to the methodology presented in the Highway Capacity Manual, 6th Edition (Transportation Research Board, 2016). As with intersections, LOS is used to describe the operating condition of freeway segments. **Table 2** lists the descriptions of the letter ratings and thresholds for each category.



**Table 2. Freeway LOS Thresholds** 

		Density <sup>1</sup>		
LOS	Description	Basic	Merge, Diverge and Weave	
Α	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver.	< 11	< 10	
В	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 to 18	> 10 to 20	
С	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 to 26	> 20 to 28	
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 to 35	> 28 to 35	
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 to 45	> 35 to 43	
F	Represents a breakdown in flow.	> 45 or v/c > 1 <sup>2</sup>	$> 43^3$ or v/c $> 1^2$	

- Notes: 1. Density is reported in vehicles per lane per mile.
  - 2. Volume-to-capacity ratio is greater than 1 (demand exceeds capacity).
  - 3. Threshold of 43 vehicles per lane per mile applies to weave segments only. Merge and diverge segments do not have a density threshold for LOS F.

Source: Highway Capacity Manual (Transportation Research Board, 2016)

The HCM method for freeway capacity analysis has the following limitations that may apply in one or more analysis scenario.

- The methodology does not account for the influence of a downstream bottleneck that causes queuing to extend into the study area.
- The methodology does not account for the influence of an upstream bottleneck that constrains traffic demand from reaching the study area.
- The capacity-enhancing effects of ramp metering and intelligent transportation system features (for example, electronic dynamic message signs) are not captured.
- · The effect of the posted speed limit and enforcement practices on actual vehicle speed is not modeled.
- The effect of a ramp HOV (high-occupancy vehicle) lane on merge segment capacity is not captured.
- The effect of a mainline HOV lane on freeway segment capacity is not modeled directly.



### **LOS Standards**

The Level of Service (LOS) standards described below are based on policies of the respective jurisdictions.

The City of Vallejo identifies LOS E as an advisory LOS standard for intersections during peak hours. The acceptable LOS standard across the system within the jurisdiction of the Solano Transportation Authority (STA), which includes Interstate 80, is LOS E (2019 Solano County Congestion Management Program, October 2019).



### Chapter 3. Existing Conditions

The existing conditions chapter presents the operations and safety of the roadway system. The operations analysis is a detailed evaluation of individual facilities with separate discussions for intersections and freeway segments. Crash history for roadways adjacent to the proposed project are presented. The existing transit, bicycle and pedestrian systems are also discussed.

### **Description of Study Facilities**

The roadway study area includes American Canyon Road from the I-80 westbound ramps to Hiddenbrooke Parkway and McGary Road. The freeway network extends along I-80 just to the east and west of American Canyon.

- American Canyon Road is two-lane east-west arterial that extends from Wetlands Edge Road on the west side of American Canyon to the I-80 eastbound ramps in the study area.
- Hiddenbrooke Parkway is a two-lane east-west collector street that provides access to the Hiddenbrooke community south of the study area.
- McGary Road is a two-lane road that runs parallel to I-80 between the study area and Cordelia to
  the northeast. McGary Road terminates approximately 1 mile south of the study area at a private
  property.
- I-80 is an east-west freeway that traverses the United States from San Francisco to New York. In the study area, the freeway has four lanes in each direction and serves regional traffic between the Bay Area and the Sacramento metropolitan area.

The I-80/Hiddenbrooke Parkway interchange has slip on-ramps and off-ramps. The American Canyon Road and Hiddenbrooke Parkway intersections with the I-80 westbound and eastbound ramps are both all-way stop-controlled intersections. The Hiddenbrooke Parkway and McGary Road intersection is a side-street stop-controlled intersection with northbound, eastbound, and westbound traffic yielding to the southbound approach.

**Figure 4** shows peak hour vehicle turning movement volumes, traffic control, and lane configurations for the study intersections. Freeway mainline peak hour volumes are shown in **Table 3**.



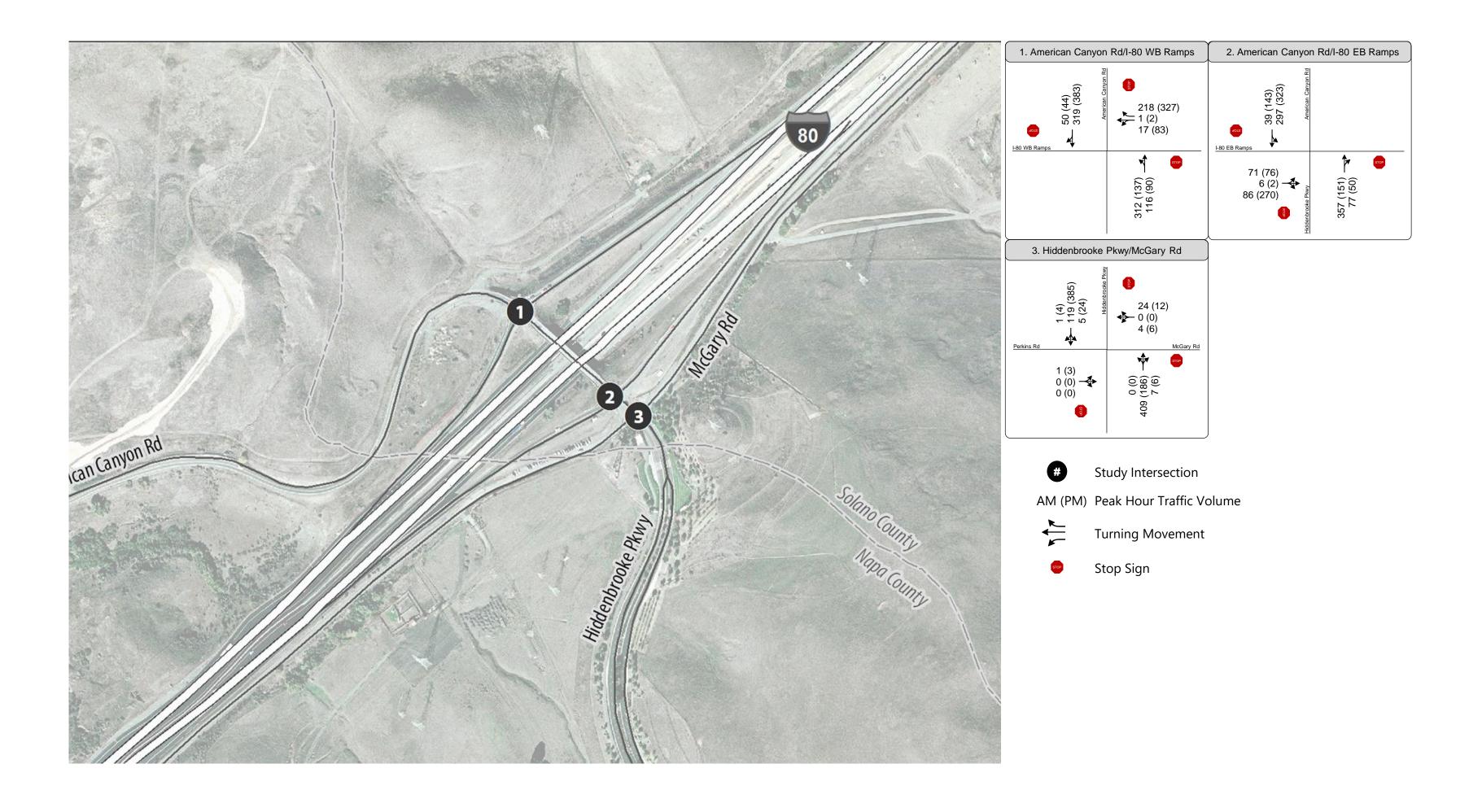




Figure 4
Peak Hour Traffic Volumes and Lane Configurations
Existing (2020) Conditions

Table 3. I-80 Mainline Peak Hour Volumes – Existing Conditions

Garman .		Volumes		
	Segment		PM	
Α	I-80 Eastbound - American Canyon Road Off-ramp	3,225	4,704	
В	I-80 Eastbound - American Canyon Road Off- to On-ramp	3,062	4,356	
С	I-80 Eastbound - American Canyon Road On-ramp	3,442	4,731	
D	I-80 Westbound - American Canyon Road Off-ramp	4,217	3,769	
Е	I-80 Westbound - American Canyon Road Off- to On-ramp	3,981	3,357	
F	I-80 Westbound - American Canyon Road On-ramp	4,344	3,540	

Source: Fehr & Peers, 2020

### **Intersection Operations**

Intersection operations were analyzed for existing (2020) conditions for both the AM and PM peak hours using SimTraffic software. **Table 4** shows the intersection LOS and average delay under existing conditions, and **Table 5** reports the average maximum gueue length under existing conditions.

During both the AM and PM peak hours, the I-80 eastbound and westbound ramp intersections have LOS A or better conditions. Similarly, the Hiddenbrooke Parkway and McGary Road intersection operates at LOS A during the PM Peak Hour. During the AM peak hour, however, the relatively high volume of vehicles exiting the Hiddenbrooke community results in LOS D conditions for the northbound approach at the Hiddenbrooke Parkway and McGary Road intersection.

During both the AM and PM peak hours, queues under existing conditions can generally be accommodated by available storage lengths. The exception to this is the northbound approach at the American Canyon Road and I-80 eastbound ramps intersection, where queues may occasionally spill back into the Hiddenbrooke Parkway and McGary Road intersection.

**Table 4. Intersection Operations - Existing Conditions** 

			LOS / Delay <sup>1</sup>		
	Intersection	Control	AM Peak Hour	PM Peak Hour	
1	Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	All-Way Stop	A/9	A/9	
2	Hiddenbrooke Parkway-American Canyon Road / I-80 EB Ramps	All-Way Stop	A/7	A/9	
3	Hiddenbrooke Parkway / McGary Road	Side Street Stop <sup>2</sup>	D / 27 (NB)	A / 9 (NB)	

Notes:

- 1. Delay is reported in seconds per vehicle. Bold and underline font indicate LOS F conditions; that is, volume exceeds capacity.
- 2. The highest controlled movement delay is reported for side street stop-controlled intersection.



**Table 5. Average Maximum Queue Length – Existing Conditions** 

				Queue Length		
	Intersection	Approach	Storage Length	AM Peak Hour	PM Peak Hour	
		Northbound	440	80	80	
1	Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	Southbound	>1,040	100	120	
	, i do Wb Ramps	Westbound	1,220	60	100	
		Northbound	60	<u>80</u>	<u>80</u>	
2	Hiddenbrooke Parkway-American Canyon Road / I-80 EB Ramps	Southbound	440	80	120	
	, 1 00 L5 Namps	Eastbound	1,020	60	100	
		Northbound	>900	260	80	
2		Southbound	60	20	20	
3	Hiddenbrooke Parkway / McGary Road	Westbound	>620	60	40	
		Eastbound	>1,020	20	20	

Notes: Storage length and average maximum queue length are reported in feet.

### **Freeway Operations**

Freeway operations were analyzed for existing (2020) conditions during the AM and PM peak hours using HCM methodologies. **Table 6** presents freeway operations under existing conditions for I-80 at the Hiddenbrooke Parkway interchange. During the both the AM and PM peak hours, all eastbound and westbound freeway study segments would operate at LOS C or better conditions.

**Table 6. Freeway Operations – Existing Conditions** 

Samont	Encility Tymo	LOS / Density <sup>1</sup>		
Segment	Facility Type	AM Peak Hour	PM Peak Hour	
I-80 Eastbound - American Canyon Road Off-ramp	Diverge	B / 13	C / 19	
I-80 Eastbound - American Canyon Road Off- to On-ramp	Basic	B / 12	B / 17	
I-80 Eastbound - American Canyon Road On-ramp	Merge	B / 14	C / 20	
I-80 Westbound - American Canyon Road Off-ramp	Diverge	C / 17	C / 15	
I-80 Westbound - American Canyon Road Off- to On-ramp	Basic	B / 15	B / 13	
I-80 Westbound - American Canyon Road On-ramp	Merge	C / 18	B / 14	

Notes:

1. Density is reported in passenger car equivalents per lane per mile.



### **Roadway Safety**

City of Vallejo staff provided collision data that they queried from the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) database of collisions in the study area. **Table 7** lists the collisions by type on American Canyon Road and Hiddenbrooke Road at or near the I-80 ramps. The collisions occurred between January 1, 2017 and December 31, 2019. During the three-year period, one injury collision occurred at the intersection of the I-80 westbound ramps and American Canyon Road. This collision involved a single vehicle that was involved with a fixed object and overturned.

Table 7. Collision History – American Canyon Road / Hiddenbrooke Parkway

		Intersection	
Collision Type	I-80 Westbound	I-80 Eastbound	McGary Road
Fixed Object	1	0	0

Notes: Collisions occurred from January 1, 2017 through December 31, 2019.

Source: SWITRS, City of Vallejo

**Table 8** shows reported collisions for the I-80 freeway mainline from the TASAS database for October 1, 2016 through September 20, 2019. The collisions are separately shown for the portion of I-80 in Napa County, west of the interchange, from Postmile 7.400 to 8.003, and for the portion of I-80 in Solano County, east of the interchange, from Postmile 8.004 to 8.549. For the three-year period, a total of 69 collisions were reported in this 1.15-mile segment of I-80, with no fatalities involved in the reported collisions. This data summary includes collisions on the freeway segment and the ramps. During the three-year period, two collisions were reported at the eastbound off-ramp at Postmile 7.974 and three collisions occurred at the eastbound on-ramp at Postmile 8.355. No collisions were reported at the westbound ramps.

For the segment of I-80 in Napa County to the west of the interchange, the actual total collision rate of 0.34 is well below the statewide average rate of 0.70 for comparable freeway facilities. The actual collision rate for Fatal and Injury collisions (F&I) of 0.06 is substantially below the statewide average rate of 0.23 for F&I collisions on comparable freeway facilities.

For the segment of I-80 in Solano County to the east of the interchange, the actual total collision rate of 0.48 is well below the statewide average rate of 0.70 for comparable freeway facilities. The actual collision rate for Fatal and Injury collisions (F&I) of 0.20 is below the statewide average rate of 0.23 for F&I collisions on comparable freeway facilities.



Table 8. Collision History – I-80 Mainline and Ramps

Location	Postmiles	Total Collisions	Total MVM		Actu	al Coll Rate <sup>1</sup>	ision	Avera	ge Co Rate¹	llision		
		Collisions	ratalities	rataiities	ī		F	F&I	Total	F	F&I	Total
Napa County – west of interchange	PM 7.400-8.803	30	0	88.10	0.0	0.06	0.34	0.006	0.23	0.70		
Solano County – east of interchange	PM 8.004-8.549	39	0	81.07	0.0	0.20	0.48	0.006	0.23	0.70		

Notes: The collision rate is in collisions per million vehicle-miles. "F" refers to the fatality collision rate, and "F&I" refers to the fatality and injury collision rate.

and injury constort rate.

Source: Caltrans TASAS Table B, October 1, 2016 through September 30, 2019.

### **Multimodal Facilities**

SolTrans provides public transportation service to the southern Solano County cities of Vallejo and Benicia. However, while one express route (Route R) travels along I-80 adjacent to the Hiddenbrooke Community, it remains on the highway and does not make stops within the study area.

Bicycle facilities in the project study area primarily serve recreational bicycling during off-peak periods. McGary Road provides a connection between the Solano Bikeway southwest of the study area and Cordelia to the northeast. East of Hiddenbrooke Parkway, McGary Road has Class II bicycle lanes on both sides of the road. West of Hiddenbrooke Parkway, bicyclists on McGary Road share the road with vehicle traffic.

The Ridge Trail is a mixed-use path that begins just south of McGary Road and continues along the west side of Hiddenbrooke Parkway into the Hiddenbrooke community. It provides a connection for bicyclists to Class II bike lanes within the community, and for people walking to a network of nearby trails. During the PM peak hour, four bicycles per hour were observed traveling along McGary Road and between McGary Road and Hiddenbrooke Parkway. No bicyclists were present during the AM peak hour.

With the exception of the Ridge Trail described above, there are no sidewalks, crosswalks, or other facilities for people walking in the study area. No pedestrians were counted crossing at any of the study intersections during the AM and PM peak hours.



## Chapter 4. Opening Year 2024

This chapter presents opening year (2024) forecasts and operations of the roadway system under no project conditions.

### 2024 Opening Year Forecasts

**Figure 5** shows peak hour vehicle turning movement volumes, traffic control, and lane configurations for the study intersections for opening year (2024) conditions. Freeway mainline peak hour volumes are shown in **Table 9**. These volumes represent traffic demand volumes from projected regional and local growth in the study area. The traffic volumes for the two project alternatives are the same as for the no project alternative.

Compared to existing conditions, opening year volumes show an increase of approximately 140 to 240 vehicles at each intersection during the AM and PM peak hours. I-80 mainline volumes are similar to existing conditions with showing only slight increases. The largest increases, of approximately 100 vehicles, occur on the two mainline segments after the westbound and eastbound on-ramps during the AM peak hour.

Table 9. I-80 Mainline Peak Hour Volumes – 2024 Opening Year Conditions

Sagment		Volumes		
	Segment		PM	
Α	I-80 Eastbound - American Canyon Road Off-ramp	3,293	4,768	
В	I-80 Eastbound - American Canyon Road Off- to On-ramp	3,083	4,358	
С	I-80 Eastbound - American Canyon Road On-ramp	3,543	4,798	
D	I-80 Westbound - American Canyon Road Off-ramp	4,275	3,855	
E	I-80 Westbound - American Canyon Road Off- to On-ramp	3,985	3,385	
F	I-80 Westbound - American Canyon Road On-ramp	4,445	3,625	



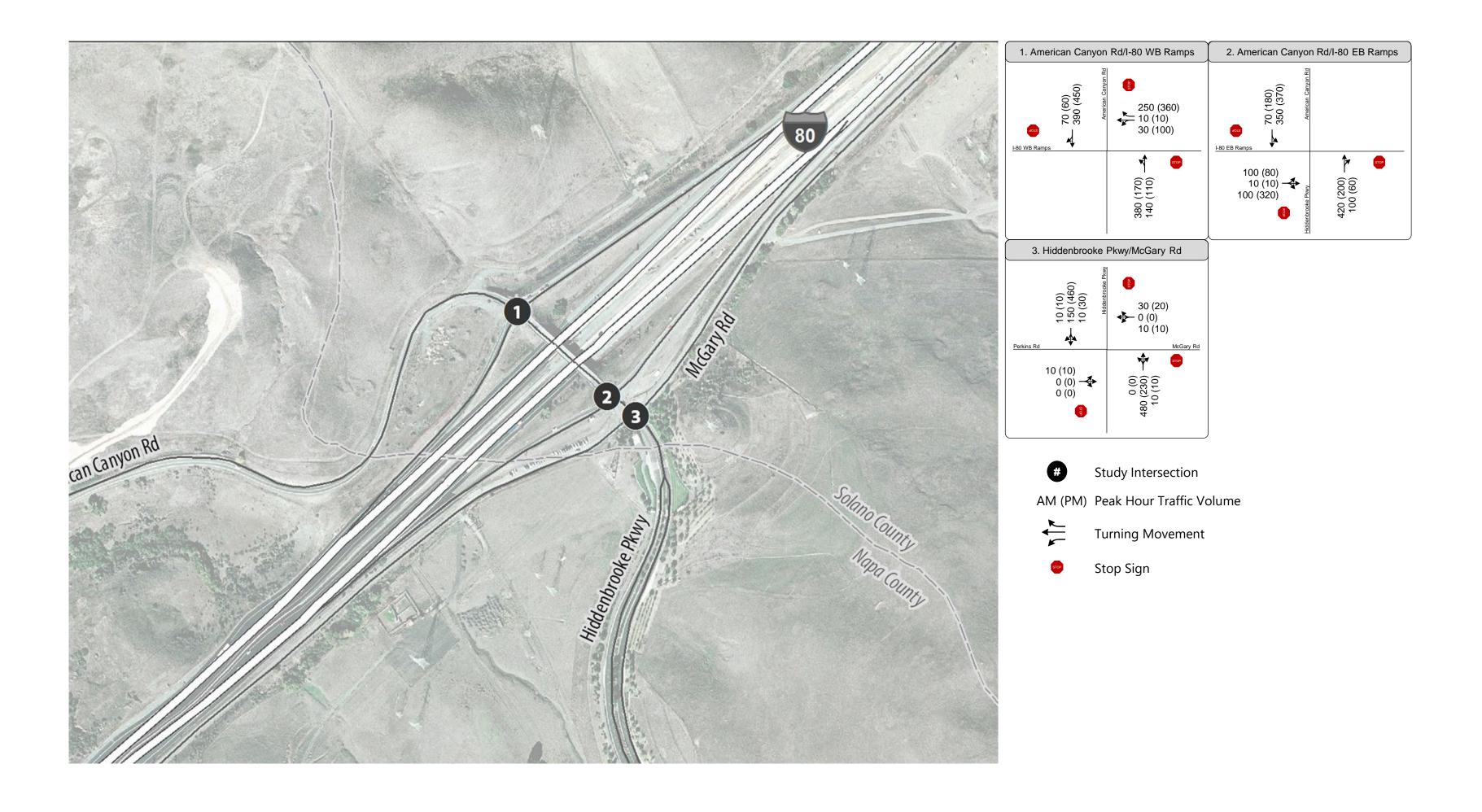




Figure 5
Peak Hour Traffic Volumes and Lane Configurations
Opening Year (2024) Conditions

### **2024 No Project Conditions**

Intersection and freeway operations were analyzed for opening year 2024 conditions for both the AM and PM peak hours. **Table 10** shows the intersection LOS and average delay under 2024 no project conditions, and **Table 11** reports the average maximum queue length under 2024 no project conditions.

### **Intersection Operations**

Under 2024 no project conditions, the projected increase in vehicle traffic would be similar or slightly degrade operations at both ramp intersections during the AM and PM peak hours, and at Hiddenbrooke Parkway and McGary Road during the PM peak hour. However, during the AM peak hour, delays would increase substantially for the northbound approach at Hiddenbrooke Parkway and McGary Road, with average delays increasing to over 80 seconds per vehicle. Similarly, average queue lengths would slightly increase at most approaches, but would more than double for the northbound approach at Hiddenbrooke Parkway and McGary Road, increasing from 260 feet to 680 feet.

**Table 10. Intersection Operations – 2024 No Project Conditions** 

Intersection			LOS / Delay <sup>1</sup>	
		Control	AM Peak Hour	PM Peak Hour
1	Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	All-Way Stop	B / 11	B / 10
2	Hiddenbrooke Parkway-American Canyon Road / I-80 EB Ramps	All-Way Stop	A/9	B / 12
3	Hiddenbrooke Parkway / McGary Road	Side Street Stop <sup>2</sup>	<b>F/&gt;80</b> (NB)	B / 11 (NB)

#### Notes:

- 1. Delay is reported in seconds per vehicle. Bold and underline font indicate LOS F conditions; that is, volume exceeds capacity.
- 2. The highest controlled movement delay is reported for side street stop-controlled intersection.



**Table 11. Average Maximum Queue Length – 2024 No Project Conditions** 

			C.	Queue Length	
Intersection		Approach	Storage Length	AM Peak Hour	PM Peak Hour
Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	Northbound	440	120	80	
	,	Southbound	>1,040	180	160
		Westbound	1,220	80	120
2	Hiddenbrooke Parkway-American Canyon Road / I-80 EB Ramps	Northbound	60	80	80
		Southbound	440	120	220
		Eastbound	1,020	80	140
3	Hiddenbrooke Parkway / McGary Road	Northbound	>900	680	120
		Southbound	60	20	40
		Westbound	>620	60	40
		Eastbound	>1,020	40	20

Notes: Storage length and average maximum queue length are reported in feet.

### **Freeway Operations**

Freeway operations under 2024 conditions during the AM and PM peak hours would be similar to existing conditions, because the increase in mainline volumes is relatively small. During the both the AM and PM peak hours, all eastbound and westbound freeway study segments would operate at LOS C or better conditions. **Table 12** presents freeway operations results under 2024 conditions for I-80 at the Hiddenbrooke Parkway interchange.

**Table 12. Freeway Operations – 2024 Conditions** 

Segment		Facility Tyme	LOS / Density <sup>1</sup>		
		Facility Type	AM Peak Hour	PM Peak Hour	
Α	I-80 Eastbound - American Canyon Road Off-ramp	Diverge	B / 13	C / 19	
В	I-80 Eastbound - American Canyon Road Off- to On-ramp	Basic	B / 12	B / 17	
С	I-80 Eastbound - American Canyon Road On-ramp	Merge	B / 15	C / 20	
D	I-80 Westbound - American Canyon Road Off-ramp	Diverge	C / 17	C / 15	
Е	I-80 Westbound - American Canyon Road Off- to On-ramp	Basic	B / 15	B / 13	
F	I-80 Westbound - American Canyon Road On-ramp	Merge	C / 18	B / 15	

Notes: Density is reported in passenger car equivalents per lane per mile



# Chapter 5. Intersection Control Evaluation

This chapter presents intersection operations results for opening year 2024 conditions for the two intersection control alternatives – signalization and roundabouts. Freeway operations for both project scenarios would be consistent with the results described for the no project scenario in **Chapter 4**.

### **Description of Traffic Control Alternatives**

There are two intersection control alternatives under consideration for the I-80/Hiddenbrooke Parkway - American Canyon ramps. Signalization would implement signal controls at the I-80 eastbound and westbound ramps intersections, and widen the off-ramps to provide exclusive right turn lanes, as shown above in . The roundabouts alternative would convert the three existing intersections into two roundabouts, as shown above in .

### 2024 Conditions with Traffic Signals and Ramp Widening

The 2024 signalized conditions scenario would implement signal controls at the I-80/Hiddenbrooke Parkway - American Canyon Road eastbound and westbound ramps intersections. Intersection operations were analyzed using 2024 volumes for both the AM and PM peak hours. **Table 13** shows the intersection LOS and average delay, and **Table 14** reports the average maximum queue length. Full results are presented in **Appendix E**.

Signalizing and widening the ramp intersections would improve operations during the AM peak period for the northbound approach at Hiddenbrooke Parkway and McGary Road from LOS F to LOS B, with delays decreasing from over 80 seconds to 15 seconds. Operations at the ramp intersections would slightly degrade with signalization. The intersection at the westbound ramps would degrade from LOS B to Los C, representing an increase in the average delay of 12-16 seconds. Average delays at the eastbound ramp intersections would increase by 1-2 seconds.

Average maximum queues under signalized conditions would decrease at the Hiddenbrooke Parkway and McGary Road intersection. Queues along American Canyon Road at the ramp intersections double in some cases but would still be accommodated within the available storage lengths. Queues on the I-80 eastbound and westbound ramps would increase during the AM peak period slightly but would still be accommodated on the ramp. During the PM peak period, westbound queues would increase by approximately 20 feet, and westbound queues would decrease by approximately 40 feet.



Table 13. Intersection Operations – 2024 with Traffic Signals Conditions

Intersection			LOS / Delay <sup>1</sup>	
		Control	AM Peak Hour	PM Peak Hour
1	Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	Signalized	C / 23	C / 26
2	Hiddenbrooke Parkway-American Canyon Road / I-80 EB Ramps	Signalized	A / 10	B / 14
3	Hiddenbrooke Parkway / McGary Road	Side Street Stop <sup>2</sup>	B / 15 (NB)	A / 10 (NB)

#### Notes:

- 1. Delay is reported in seconds per vehicle. Bold and underline font indicate LOS F conditions; that is, volume exceeds capacity.
- 2. The highest controlled movement delay is reported for side street stop-controlled intersection.

Source: Fehr & Peers, 2020

Table 14. Average Maximum Queue Length – 2024 with Traffic Signals Conditions

Intersection			Storage Length	Queue Length	
		Approach		AM Peak Hour	PM Peak Hour
		Northbound American Canyon Road	440	320	220
1	Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	Southbound American Canyon Road	> 1,040	340	360
		Westbound I-80 Off-Ramp	1,220	100	140
	2 Hiddenbrooke Parkway-American Road / I-80 EB Ramps	Northbound Hiddenbrooke Parkway	40	80	60
2 Hi		Southbound American Canyon Road	440	40	280
		Eastbound I-80 Off-Ramp	1,020	140	100
	Hiddenbrooke Parkway / McGary Road	Northbound Hiddenbrooke Parkway	>900	260	140
3		Southbound Hiddenbrooke Parkway	40	20	40
3		Westbound McGary Road	>620	60	40
		Eastbound McGary Road	>1,020	40	40

Notes: Storage length and average maximum queue length are reported in feet.



### 2024 Conditions with Roundabouts

The 2024 roundabout conditions scenario would convert the three existing intersections into two roundabouts. Intersection operations were analyzed using 2024 volumes for both the AM and PM peak hours. **Table 15** summarizes the intersection LOS and average delay, and **Table 16** reports the average maximum queue length. Full results are provided in **Appendix A**.

Both the I-80/Hiddenbrooke Parkway interchange roundabouts would easily accommodate 2024 AM and PM peak hour volumes, operating at LOS A and with average maximum queue lengths well under the available storage lengths. Overall, the roundabout alternative provides better operations compared to both no project and signalized scenarios.

**Table 15. Intersection Operations – 2024 with Roundabout Conditions** 

Intersection			LOS / Delay <sup>1</sup>	
		Control	AM Peak Hour	PM Peak Hour
1	Hiddenbrooke Parkway-American Canyon Road / I-80 WB Ramps	Roundabout	A / 6	A / 6
2	Hiddenbrooke Parkway-American Canyon Road / I-80 EB Ramps	Roundabout	A / 6	A / 6

Notes:

1. Delay is reported in seconds per vehicle. Bold and underline font indicate LOS F conditions; that is, volume exceeds capacity. Source: Fehr & Peers, 2020

Table 16. Average Maximum Queue Length – 2024 with Roundabout Conditions

Intersection			Storage Length	Queue Length	
		Approach		AM Peak Hour	PM Peak Hour
	Hiddenbrooke Parkway-	Northbound American Canyon Road	440	0	0
1	American Canyon Road / I- 80 WB Ramps	Southbound American Canyon Road	>1,040	60	60
		Westbound I-80 Off-Ramp	1,220	60	60
	Hiddenbrooke Parkway- American Canyon Road / I- 80 EB Ramps	Northbound Hiddenbrooke Parkway	>900	60	20
		Southbound American Canyon Road	400	40	60
2		Eastbound I-80 Off-Ramp	1,020	20	60
		Eastbound McGary Road	>620	0	0
		Westbound McGary Road	>1,020	0	0

Notes: Storage length and average maximum queue length are reported in feet.



### Chapter 6. VMT Assessment

On September 27, 2013, Governor Jerry Brown signed SB 743 into law, which initiated a process to change transportation impact analyses completed in support of CEQA documentation. SB 743 eliminates level of service (LOS) as a basis for determining significant transportation impacts under CEQA and provides a new performance metric, vehicle miles traveled (VMT). To help lead agencies with SB 743 implementation, the Governor's Office of Planning and Research (OPR) produced a *Technical Advisory*<sup>3</sup>.

The first step of a VMT assessment is to determine what type of analysis, if any, is needed. The OPR *Technical Advisory* recommend a series of screening factors to consider to quickly determine if a proposed project is expected to cause a less than significant VMT impact without conducting a detailed study. These screening criteria are relevant to assess if a VMT analysis would be applicable for the proposed Project.

For transportation projects, OPR indicates that "projects that would not likely lead to a substantial or measurable increase in vehicle travel" should not require an induced travel analysis and may be presumed to have a less than significant transportation impact under CEQA. The following transportation project types are identified by OPR as ones that would not likely lead to a substantial or measurable increase in vehicle travel.

- Installation of roundabouts or traffic circle
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features

For Cumulative Conditions, OPR's *Technical Advisory* states that a project that is below the VMT impact thresholds and does not have a VMT impact under baseline conditions would also not have a cumulative impact as long as it is aligned with long-term State environmental goals, such as reducing GHG emissions, and relevant plans, such as the MTC RTP/SCS. For baseline conditions, the Project is screened out from further VMT analysis based on the type of transportation project. The proposed operational improvements are generally consistent with both state and regional goals.

Based on the OPR screening criteria, the installation of roundabouts or traffic signals is presumed to have a less than significant VMT impact and is screened out from further VMT analysis. The VMT thresholds and screening criteria applied in this study are based on OPR guidance.

<sup>&</sup>lt;sup>3</sup> Governor's Office of Planning and Research, Technical Advisory on Evaluating Transportation Impacts in CEQA, 2018.



### Chapter 7. Conclusions

The I-80/Hiddenbrooke Parkway-American Canyon Road interchange is the only access point for the Hiddenbrooke Community and provides access to and from the City of American Canyon via American Canyon Road. The current configuration of the interchange, given the close proximity of the two-way frontage road (McGary Road) that parallels the south side of I-80, causes operational issues during the AM peak hour that will be exacerbated by build-out of the Hiddenbrooke Community and approved projects in American Canyon.

Currently, stop-control signs are implemented on the minor approaches/streets that intersect with Hiddenbrooke Parkway-American Canyon Road within the vicinity of the project, including the I-80 eastbound and westbound ramps, and the frontage road immediately south of the interchange. The frontage road intersection, which is immediately adjacent to the I-80 eastbound off-ramp intersection, experiences queues and delays during the AM peak hour that will increase over time and exceed the City's advisory standard of LOS E.

The original EIR prepared for the Hiddenbrooke Community indicated the need for improvements to the I-80/Hiddenbrooke Parkway-American Canyon Road interchange upon build-out of the Hiddenbrooke Community. The City and developer of the Hiddenbrooke Community executed an agreement for improvements to the interchange. The City of Vallejo have since collected fees to make improvements to the interchange. Traffic studies conducted in recent years for the City of Vallejo confirm the interchange access intersections would operate at LOS F conditions by 2035 if improvements are not made. After considering numerous interchange alternatives, roundabouts and traffic signals were identified as the best available options.

Two alternatives – a multilane roundabout design alternative and as signalized intersection alternative that would also widen the two off-ramps – were developed and evaluated for existing (2020) and opening year (2024) weekday peak hour conditions in **Chapter 5**. The analysis indicates that roundabouts would perform measurably better than the alternative with traffic signals and ramp widening. Operations at the off-ramp intersections would slightly degrade with signalization under opening year (2024) conditions compared to no project conditions. Additionally, the alternative with traffic signals and ramp widening would not address potential future operational issues associated with the proximity of the McGary Road frontage intersection to the eastbound off-ramp intersection.

The two roundabout intersections would operate at LOS A conditions during both peak hours for opening year (2024) conditions, making roundabouts the superior operational improvement at the I-80/Hiddenbrooke Parkway-American Canyon Road interchange. The installation of roundabouts would have a less than significant transportation impact under CEQA.



# Appendix A: Roundabout Validation Report

# I-80/Hiddenbrooke Interchange Roundabouts Vallejo, CA

Roundabout Validation Report June 2020



# **Roundabout Validation Report**

# I-80/Hiddenbrooke Interchange Roundabouts Vallejo, CA

The engineering material and data contained in this report were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.



Reid Middleton

728 134th Street SW, Suite 200 Everett, WA 98204 425-741-3800 www.reidmiddleton.com

### TABLE OF CONTENTS

### Review Comments/Design Notes

Figure 1	I-80 Westbound Current Configuration Layout
Figure 2	I-80 Westbound Future Configuration Layout
Figure 3	I-80 Eastbound Current Configuration Layout
Figure 4	I-80 Eastbound Future Configuration Layout

### **APPENDICES**

Appendix A – Traffic Data

Appendix B – Roundabout Supporting Figures

- Figure B-1 Truck Turning Movements
- Figure B-2 Truck Turning Movements
- Figure B-3 Truck Turning Movements
- Figure B-4 Truck Turning Movements
- Figure B-5 Truck Turning Movements
- Figure B-6 Truck Turning Movements
- Figure B-7 Truck Turning Movements
- Figure B-8 Truck Turning Movements
- Figure B-9 Truck Turning Movements
- Figure B-10 Truck Turning Movements
- Figure B-11 Truck Turning Movements (Future Configuration)
- Figure B-12 Truck Turning Movements (Future Configuration)
- Figure B-13 Speed Calculations
- Figure B-14 Speed Calculations
- Figure B-15 Speed Curves
- Figure B-16 Speed Curves
- Figure B-17 Speed Curves
- Figure B-18 Speed Curves
- Figure B-19 Speed Calculations (Future Configuration)
- Figure B-20 Speed Curves (Future Configuration)

# **Design Notes**

Project Title:	I-80/Hiddenbrooke Interchange Roundabouts	Design Phase (%):	30%
Owner:	City of Vallejo, CA	Date:	June 2020
Client:	Fehr & Peers		

### Introduction/Initial Design Assumptions

Reid Middleton (RM) was contracted by Fehr & Peers to provide a Horizontal Geometric Design for two single lane roundabouts at the I-80/Hiddenbrooke Interchange in Vallejo, California.

RM designed the horizontal geometrics of these roundabouts as seen in Figures 1-4. The design vehicle movements (CA-Legal) were calculated with 6-in tire clearance to all mountable curbs, 12-in tire clearance to vertical curb and gutters and 0-in tire clearance to all truck apron curbs. In addition, an STAA-Standard truck, is accommodated on the on/off ramps of this interchange. Due to the conservative nature of AutoturnTM, these offsets will ensure the design vehicle will easily negotiate the intersection. A copy of the truck turning movements can be seen in Appendix B.

Limited pedestrian and bicycle facilities were provided in the current layout due to restrictions for these facilities across the bridge. A future layout showing the ultimate pedestrian and bicycle facilities is provided.

### I-80/Hiddenbrooke Parkway Roundabout Interchange Performance

Roundabout operational analysis was performed using SIDRA, Version 8.0 and roundabout conceptual layout geometry used. Criteria for Level of Service (LOS) are shown in Table 1. This analysis is for a 4-leg roundabout on the north side of the I-80/Hiddenbrooke Parkway interchange and a 6-leg roundabout on the south side of the interchange. A summary of the analysis results can be found in Appendix A

For the purpose of this analysis Hiddenbrooke Parkway and American Canyon Road are north-south roadways; I-80 and McGary Road are east-west roadways.

Table 1. Roundabout LOS Criteria

Level of Service	Stop-Sign & Roundabout Intersection Average Delay Per Vehicle (sec/veh)
A	≤ 10
В	$> 10 \text{ and} \le 15$
С	$> 15 \text{ and } \le 25$
D	$> 25 \text{ and} \le 35$
Е	$> 35 \text{ and} \le 50$
F	> 50

Both I-80/Hiddenbrooke Parkway interchange roundabouts easily accommodate the 2020 AM and PM peak hour volumes with reserve capacity for future growth (See Tables 2 and 3). The highest volume/capacity (v/c) ratio is 0.36 on the 4-leg roundabout and 0.36 on the 6-leg roundabout. A roundabout approach nears maximum capacity when the v/c ratio exceeds 0.85.

Table 2. 2020 American Canyon Road/I-80 WB Ramps 4-Leg Roundabout Peak Hour Performance

		AM Peak Hou	r	PM Peak Hour				
Approach	Ave Delay (sec/veh)	•		Ave Delay (sec/veh)	95% Queue (Feet)	v/c		
Northbound American Canyon Road	4.2 – A	0	0.27	3.6 – A	0	0.14		
Southbound American Canyon Road	4.4 – A	34	0.34	3.9 – A	31	0.31		
Westbound I-80 Off-Ramp	8.7 – A	27	0.23	8.7 – A	43	0.36		
Intersection:	5.3 - A	-		5.8 - A	-			

Table 3. 2020 Hiddenbrooke Parkway/American Canyon Road/I-80 EB Ramps/McGary Road 6-Leg Roundabout Peak Hour Performance

	/	AM Peak Hou	r	ı	PM Peak Hou	r
Approach	Ave Delay (sec/veh)	95% Queue (Feet)	v/c	Ave Delay (sec/veh)	95% Queue (Feet)	v/c
Northbound Hiddenbrooke Parkway	3.8 – A	36	0.36	3.7 – A	16	0.17
Southbound American Canyon Road	8.0 – A	27	0.21	6.8 – A	40	0.30
Eastbound I-80 Off-Ramp	3.6 – A	12	0.14	3.6 – A	36	0.32
Eastbound McGary Road	6.2 – A	1	0.01	9.5 – A	2	0.02
Westbound McGary Road	7.9 – A	4	0.03	7.7 – A	1	0.01
Intersection:	5.4 – A			5.2 – A		

Both I-80/Hiddenbrooke Parkway interchange roundabouts easily accommodate the 2024 AM and PM peak hour volumes with reserve capacity for future growth (See Tables 4 and 5). The highest volume/capacity (v/c) ratio is 0.46 on the 4-leg roundabout and 0.45 on the 6-leg roundabout. A roundabout approach nears maximum capacity when the v/c ratio exceeds 0.85.

Table 4. 2024 American Canyon Road/I-80 WB Ramps 4-Leg Roundabout Peak Hour Performance

		AM Peak Hou	r	PM Peak Hour				
Approach	Ave Delay (sec/veh)			Ave Delay 95% (sec/veh) Queue (Feet)		v/c		
Northbound American Canyon Road	4.2 – A	0	0.33	3.6 – A	0	0.18		
Southbound American Canyon Road	5.4 – A	48	0.46	4.3 – A	54	0.45		
Westbound I-80 Off-Ramp	10.4 – B	60	0.37	9.1 – A	54	0.43		
Intersection:	6.3 - A			5.9 – A				

Table 5. 2024 Hiddenbrooke Parkway/American Canyon Road/I-80 EB Ramps/McGary Road 6-Leg Roundabout Peak Hour Performance

	l l	AM Peak Hou	r	F	PM Peak Hou	r
Approach	Ave Delay 95% v/c (sec/veh) Queue (Feet)		Ave Delay (sec/veh)	95% Queue (Feet)	v/c	
Northbound Hiddenbrooke Parkway	4.5 – A	57	0.45	4.1 – A	23	0.22
Southbound American Canyon Road	7.7 – A	40	0.27	6.7 – A	53	0.35
Eastbound I-80 Off-Ramp	4.3 – A	18	0.19	4.2 – A	51	0.40
Eastbound McGary Road	9.0 – A	1	0.01	12.1 – B	3	0.02
Westbound McGary Road	10.8 – B	9	0.06	8.6 – A	4	0.03
Intersection:	5.9 – A			5.5 – A		

June 2020

Both I-80/Hiddenbrooke Parkway interchange roundabouts easily accommodate the 2035 AM and PM peak hour volumes with reserve capacity for additional growth (See Tables 6 and 7). The highest volume/capacity (v/c) ratio is 0.70 on the 4-leg roundabout and 0.45 on the 6-leg roundabout.

Table 6. 2035 American Canyon Road/I-80 WB Ramps 4-Leg Roundabout Peak Hour Performance

	A	AM Peak Hou	r	l	PM Peak Hou	r
Approach	Ave Delay (sec/veh)			Ave Delay 95% (sec/veh) Queue (Feet)		v/c
Northbound American Canyon Road	4.3 – A	0	0.28	3.4 – A	0	0.19
Southbound American Canyon Road	6.5 – A	147	0.70	5.0 – A	113	0.65
Eastbound I-80 Off-Ramp	9.2 – A	29	0.25	9.2 – A	69	0.50
Intersection:	6.3 - A			6.1 – A		

Table 7. 2035 Hiddenbrooke Parkway/American Canyon Road/I-80 EB Ramps/McGary Road 6-Leg Roundabout Peak Hour Performance

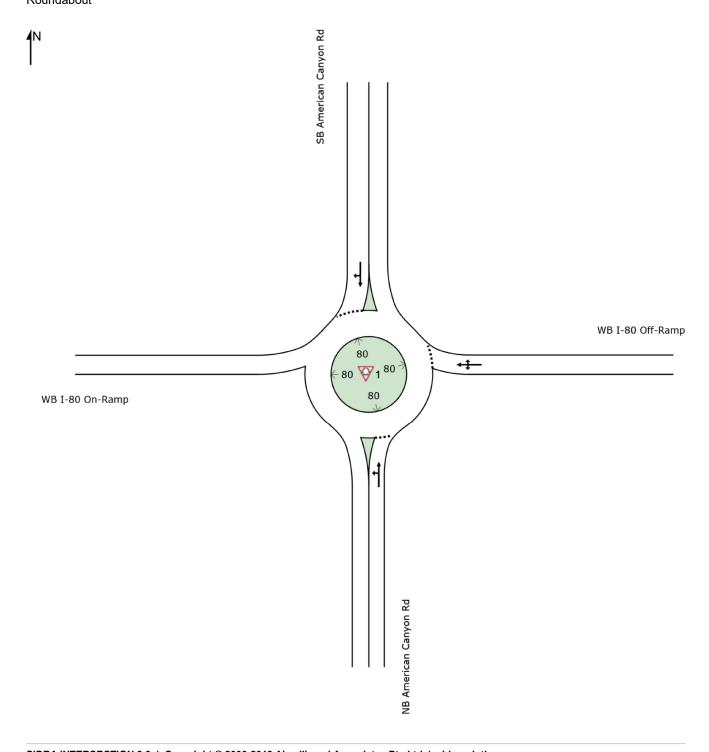
	l l	AM Peak Hou	r	F	PM Peak Hou	r
Approach	Ave Delay 95% v/c (sec/veh) Queue (Feet)		Ave Delay (sec/veh)	95% Queue (Feet)	v/c	
Northbound Hiddenbrooke Parkway	5.7 – A	70	0.45	4.5 – A	24	0.21
Southbound American Canyon Road	8.1 – A	58	0.37	6.7 – A	60	0.38
Eastbound I-80 Off-Ramp	4.7 – A	15	0.14	5.0 – A	54	0.40
Eastbound McGary Road	9.6 – A	2	0.01	12.9 – B	5	0.03
Westbound McGary Road	11.8 – B	10	0.06	9.4 – A	3	0.02
Intersection:	6.9 - A			5.9 – A		

# APPENDIX A (TRAFFIC DATA)

### **SITE LAYOUT**

# **∀** Site: 1 [2035 PM PH I-80 Ramps-American Canyon Rd (SIDRA) DG]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2035 PM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout



# ₩ Site: 1 [2020 AM PH I-80 Ramps-American Canyon Rd (SIDRA) DG]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2020 AM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout

Move	Movement Performance - Vehicles											
Mov ID	Turn	Demand I Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South	South: NB American Canyon Rd											
3	L2	339	2.0	0.270	5.5	LOS A	0.0	0.0	0.00	0.46	0.00	35.5
8	T1	126	2.0	0.270	0.7	LOS A	0.0	0.0	0.00	0.46	0.00	29.6
Appro	ach	465	2.0	0.270	4.2	LOS A	0.0	0.0	0.00	0.46	0.00	33.7
East: \	WB I-80	Off-Ramp										
1	L2	18	2.0	0.236	14.0	LOS B	1.0	26.6	0.46	0.71	0.46	39.7
6	T1	1	2.0	0.236	9.1	LOS A	1.0	26.6	0.46	0.71	0.46	45.3
16	R2	237	2.0	0.236	8.3	LOS A	1.0	26.6	0.46	0.71	0.46	37.4
Appro	ach	257	2.0	0.236	8.7	LOS A	1.0	26.6	0.46	0.71	0.46	37.6
North:	SB Ame	erican Canyo	n Rd									
4	T1	347	2.0	0.335	4.3	LOS A	1.3	34.2	0.37	0.49	0.37	30.6
14	R2	54	2.0	0.335	4.6	LOS A	1.3	34.2	0.37	0.49	0.37	36.9
Appro	ach	401	2.0	0.335	4.4	LOS A	1.3	34.2	0.37	0.49	0.37	31.6
All Vel	nicles	1123	2.0	0.335	5.3	LOS A	1.3	34.2	0.24	0.53	0.24	34.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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# ₩ Site: 1 [2020 PM PH I-80 Ramps-American Canyon Rd (SIDRA) DG]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2020 PM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout

Move	Movement Performance - Vehicles											
Mov ID	Turn	Demand I Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South	South: NB American Canyon Rd											
3	L2	149	2.0	0.143	5.5	LOS A	0.0	0.0	0.00	0.41	0.00	36.1
8	T1	98	2.0	0.143	0.7	LOS A	0.0	0.0	0.00	0.41	0.00	30.0
Appro	ach	247	2.0	0.143	3.6	LOS A	0.0	0.0	0.00	0.41	0.00	33.4
East: \	WB I-80	Off-Ramp										
1	L2	90	2.0	0.360	13.2	LOS B	1.7	42.5	0.36	0.67	0.36	39.5
6	T1	2	2.0	0.360	8.3	LOS A	1.7	42.5	0.36	0.67	0.36	45.1
16	R2	355	2.0	0.360	7.5	LOS A	1.7	42.5	0.36	0.67	0.36	37.3
Appro	ach	448	2.0	0.360	8.7	LOS A	1.7	42.5	0.36	0.67	0.36	37.7
North:	SB Ame	rican Canyo	n Rd									
4	T1	347	2.0	0.310	3.9	LOS A	1.2	30.8	0.30	0.44	0.30	30.8
14	R2	48	2.0	0.310	4.1	LOS A	1.2	30.8	0.30	0.44	0.30	37.1
Appro	ach	395	2.0	0.310	3.9	LOS A	1.2	30.8	0.30	0.44	0.30	31.7
All Vel	nicles	1089	2.0	0.360	5.8	LOS A	1.7	42.5	0.26	0.53	0.26	34.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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# \[ \infty \] Site: 1 [2024 AM PH I-80 Ramps-American Canyon Rd (SIDRA) DG] \]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2024 AM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand l Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	0
South	South: NB American Canyon Rd											
3	L2	413	2.0	0.328	5.5	LOS A	0.0	0.0	0.00	0.46	0.00	35.5
8	T1	152	2.0	0.328	0.7	LOS A	0.0	0.0	0.00	0.46	0.00	29.6
Appro	ach	565	2.0	0.328	4.2	LOS A	0.0	0.0	0.00	0.46	0.00	33.7
East: \	WB I-80	Off-Ramp										
1	L2	76	2.0	0.369	14.9	LOS B	1.9	48.0	0.57	0.78	0.57	38.2
6	T1	33	2.0	0.369	9.9	LOS A	1.9	48.0	0.57	0.78	0.57	43.9
16	R2	272	2.0	0.369	9.2	LOS A	1.9	48.0	0.57	0.78	0.57	36.5
Appro	ach	380	2.0	0.369	10.4	LOS B	1.9	48.0	0.57	0.78	0.57	37.3
North:	SB Ame	erican Canyo	n Rd									
4	T1	424	2.0	0.453	5.4	LOS A	2.4	59.8	0.54	0.62	0.55	30.0
14	R2	76	2.0	0.453	5.6	LOS A	2.4	59.8	0.54	0.62	0.55	36.3
Appro	ach	500	2.0	0.453	5.4	LOS A	2.4	59.8	0.54	0.62	0.55	31.2
All Vel	nicles	1446	2.0	0.453	6.3	LOS A	2.4	59.8	0.34	0.60	0.34	33.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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 \[
 \infty \text{Site: 1 [2024 PM PH I-80 Ramps-American Canyon Rd (SIDRA) DG]}
 \]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2024 PM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformance	e - Vehi	icles								
Mov ID	Turn	Demand   Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South	: NB Ame	erican Canyo	n Rd									
3	L2	185	2.0	0.176	5.5	LOS A	0.0	0.0	0.00	0.42	0.00	36.1
8	T1	120	2.0	0.176	0.7	LOS A	0.0	0.0	0.00	0.42	0.00	30.0
Appro	ach	304	2.0	0.176	3.6	LOS A	0.0	0.0	0.00	0.42	0.00	33.4
East: \	WB I-80	Off-Ramp										
1	L2	109	2.0	0.425	13.5	LOS B	2.1	54.4	0.43	0.69	0.43	39.2
6	T1	11	2.0	0.425	8.6	LOS A	2.1	54.4	0.43	0.69	0.43	44.8
16	R2	391	2.0	0.425	7.9	LOS A	2.1	54.4	0.43	0.69	0.43	37.1
Appro	ach	511	2.0	0.425	9.1	LOS A	2.1	54.4	0.43	0.69	0.43	37.6
North:	SB Ame	rican Canyo	n Rd									
4	T1	489	2.0	0.446	4.3	LOS A	2.1	53.5	0.40	0.48	0.40	30.5
14	R2	65	2.0	0.446	4.5	LOS A	2.1	53.5	0.40	0.48	0.40	36.8
Appro	ach	554	2.0	0.446	4.3	LOS A	2.1	53.5	0.40	0.48	0.40	31.4
All Vel	nicles	1370	2.0	0.446	5.9	LOSA	2.1	54.4	0.32	0.55	0.32	34.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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## ₩ Site: 1 [2035 AM PH I-80 Ramps-American Canyon Rd (SIDRA) DG]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2035 AM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformance	e - Vehi	icles								
Mov ID	Turn	Demand   Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South	: NB Ame	erican Canyo	n Rd									
3	L2	364	2.0	0.280	5.5	LOS A	0.0	0.0	0.00	0.47	0.00	35.4
8	T1	118	2.0	0.280	0.7	LOS A	0.0	0.0	0.00	0.47	0.00	29.5
Appro	ach	483	2.0	0.280	4.3	LOS A	0.0	0.0	0.00	0.47	0.00	33.8
East: \	WB I-80	Off-Ramp										
1	L2	36	2.0	0.253	14.1	LOS B	1.1	29.2	0.48	0.72	0.48	39.3
6	T1	5	2.0	0.253	9.2	LOS A	1.1	29.2	0.48	0.72	0.48	44.9
16	R2	232	2.0	0.253	8.5	LOS A	1.1	29.2	0.48	0.72	0.48	37.2
Appro	ach	273	2.0	0.253	9.2	LOS A	1.1	29.2	0.48	0.72	0.48	37.5
North:	SB Ame	rican Canyo	n Rd									
4	T1	604	2.0	0.699	6.5	LOS A	5.8	147.1	0.61	0.73	0.73	29.7
14	R2	235	2.0	0.699	6.7	LOS A	5.8	147.1	0.61	0.73	0.73	36.0
Appro	ach	839	2.0	0.699	6.5	LOS A	5.8	147.1	0.61	0.73	0.73	31.7
All Ve	hicles	1595	2.0	0.699	6.3	LOS A	5.8	147.1	0.40	0.65	0.47	33.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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## ₩ Site: 1 [2035 PM PH I-80 Ramps-American Canyon Rd (SIDRA) DG]

I-80 Ramps/American Canyon Road/Hiddenbrooke Parkway 2035 PM Peak Hour (DG) Single-Lane, 4-Leg (SIDRA) Site Category: (None) Roundabout

Move	Movement Performance - Vehicles													
Mov ID	Turn	Demand l Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph		
South	: NB Ame	erican Canyo	n Rd											
3	L2	180	2.0	0.187	5.5	LOS A	0.0	0.0	0.00	0.40	0.00	36.3		
8	T1	141	2.0	0.187	0.7	LOS A	0.0	0.0	0.00	0.40	0.00	30.1		
Appro	ach	322	2.0	0.187	3.4	LOS A	0.0	0.0	0.00	0.40	0.00	33.3		
East: \	WB I-80	Off-Ramp												
1	L2	110	2.0	0.496	13.8	LOS B	2.7	68.9	0.48	0.71	0.48	39.1		
6	T1	5	2.0	0.496	8.8	LOS A	2.7	68.9	0.48	0.71	0.48	44.7		
16	R2	478	2.0	0.496	8.1	LOS A	2.7	68.9	0.48	0.71	0.48	37.1		
Appro	ach	593	2.0	0.496	9.2	LOS A	2.7	68.9	0.48	0.71	0.48	37.4		
North:	SB Ame	rican Canyo	n Rd											
4	T1	549	2.0	0.643	4.9	LOS A	4.4	112.5	0.51	0.59	0.55	30.1		
14	R2	268	2.0	0.643	5.2	LOS A	4.4	112.5	0.51	0.59	0.55	36.5		
Appro	ach	817	2.0	0.643	5.0	LOS A	4.4	112.5	0.51	0.59	0.55	32.5		
All Vel	hicles	1733	2.0	0.643	6.1	LOSA	4.4	112.5	0.41	0.59	0.42	34.4		

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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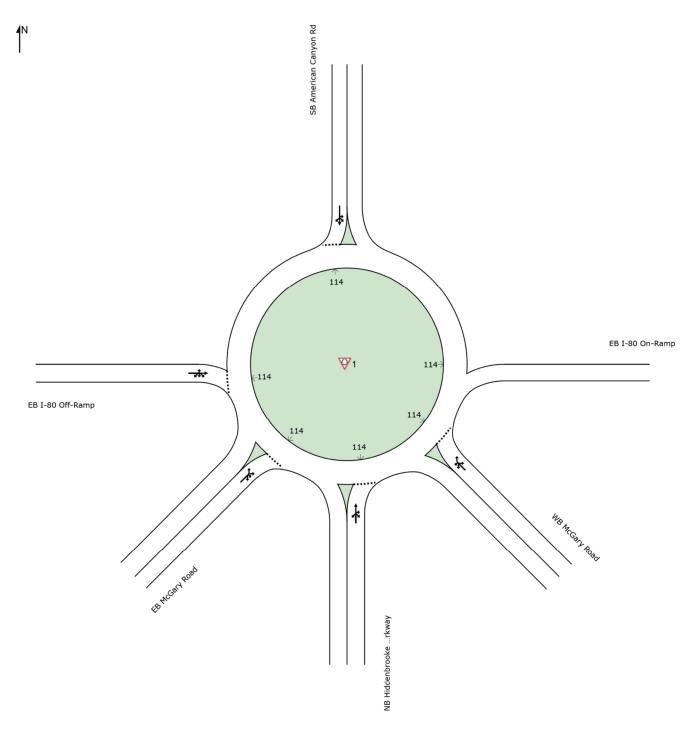
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### **SITE LAYOUT**

Site: 1 [2035 PM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG] I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2035 PM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None)

Roundabout



♥ Site: 1 [2020 AM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG]

I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2020 AM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformanc	e - Vehi	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South:	NB Hid	denbrooke F										
3b	L3	1	2.0	0.358	12.5	LOS B	1.5	38.4	0.40	0.44	0.40	36.0
8	T1	366	2.0	0.358	3.7	LOS A	1.5	38.4	0.40	0.44	0.40	33.7
18	R2	78	2.0	0.358	4.2	LOS A	1.5	38.4	0.40	0.44	0.40	32.2
18b	R3	8	2.0	0.358	5.2	LOS A	1.5	38.4	0.40	0.44	0.40	33.7
Approa	ach	453	2.0	0.358	3.8	LOS A	1.5	38.4	0.40	0.44	0.40	33.5
South	East: WE	B McGary R	oad									
3bx	L3	4	2.0	0.034	14.4	LOS B	0.2	4.5	0.62	0.63	0.62	36.6
3x	L2	1	2.0	0.034	13.2	LOS B	0.2	4.5	0.62	0.63	0.62	36.1
18ax	R1	21	2.0	0.034	6.4	LOS A	0.2	4.5	0.62	0.63	0.62	35.6
18bx	R3	5	2.0	0.034	7.1	LOS A	0.2	4.5	0.62	0.63	0.62	33.3
Approa	ach	32	2.0	0.034	7.9	LOS A	0.2	4.5	0.62	0.63	0.62	35.4
North:	SB Ame	rican Canyo	on Rd									
7	L2	323	2.0	0.213	8.7	LOS A	1.1	27.4	0.05	0.59	0.05	32.2
7a	L1	2	2.0	0.213	8.7	LOS A	1.1	27.4	0.05	0.59	0.05	33.4
4	T1	39	2.0	0.213	2.4	LOS A	1.1	27.4	0.05	0.59	0.05	32.3
14a	R1	1	2.0	0.213	3.2	LOS A	1.1	27.4	0.05	0.59	0.05	33.4
Approa	ach	365	2.0	0.213	8.0	LOS A	1.1	27.4	0.05	0.59	0.05	32.3
West:	EB I-80	Off-Ramp										
5	L2	77	2.0	0.137	6.0	LOS A	0.5	11.7	0.31	0.45	0.31	29.5
2	T1	7	2.0	0.137	8.0	LOS A	0.5	11.7	0.31	0.45	0.31	28.1
12a	R1	3	2.0	0.137	4.0	LOS A	0.5	11.7	0.31	0.45	0.31	30.3
12	R2	89	2.0	0.137	1.7	LOS A	0.5	11.7	0.31	0.45	0.31	28.2
12b	R3	1	32.0	0.137	5.4	LOS A	0.5	11.7	0.31	0.45	0.31	28.5
Approa	ach	177	2.2	0.137	3.6	LOS A	0.5	11.7	0.31	0.45	0.31	28.8
South\	West: EE	B McGary R	oad									
5ax	L1	1	2.0	0.004	10.0	LOS B	0.0	0.4	0.42	0.52	0.42	36.4
12ax	R1	1	2.0	0.004	4.6	LOS A	0.0	0.4	0.42	0.52	0.42	35.5
12x	R2	1	2.0	0.004	5.1	LOS A	0.0	0.4	0.42	0.52	0.42	35.4
12bx	R3	1	2.0	0.004	5.3	LOS A	0.0	0.4	0.42	0.52	0.42	34.9
Approa	ach	4	2.0	0.004	6.2	LOS A	0.0	0.4	0.42	0.52	0.42	35.6
All Veh	nicles	1032	2.0	0.358	5.4	LOS A	1.5	38.4	0.27	0.50	0.27	32.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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Project: H:\25St\15\015 I-80 and Hiddenbrooke RB (Fehr and Peers)\Traffic\I-80 - Hiddenbrooke Parkway Interchange\_wrm.sip8

# ♥ Site: 1 [2020 PM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG]

I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2020 PM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformanc	e - Vehi	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South:	NB Hid	denbrooke F										
3b	L3	1	2.0	0.168	12.3	LOS B	0.6	15.9	0.37	0.43	0.37	36.2
8	T1	152	2.0	0.168	3.5	LOS A	0.6	15.9	0.37	0.43	0.37	33.9
18	R2	50	2.0	0.168	4.0	LOS A	0.6	15.9	0.37	0.43	0.37	32.4
18b	R3	7	2.0	0.168	5.0	LOS A	0.6	15.9	0.37	0.43	0.37	33.9
Approa	ach	210	2.0	0.168	3.7	LOS A	0.6	15.9	0.37	0.43	0.37	33.5
South	East: WE	B McGary R	oad									
3bx	L3	7	2.0	0.020	12.9	LOS B	0.1	2.0	0.46	0.59	0.46	36.6
3x	L2	1	2.0	0.020	11.7	LOS B	0.1	2.0	0.46	0.59	0.46	36.1
18ax	R1	13	2.0	0.020	4.9	LOS A	0.1	2.0	0.46	0.59	0.46	35.5
18bx	R3	1	2.0	0.020	5.6	LOS A	0.1	2.0	0.46	0.59	0.46	33.3
Approa	ach	22	2.0	0.020	7.7	LOS A	0.1	2.0	0.46	0.59	0.46	35.8
North:	SB Ame	erican Canyo	on Rd									
7	L2	351	2.0	0.296	8.7	LOS A	1.6	39.5	0.06	0.54	0.06	32.8
7a	L1	1	2.0	0.296	8.7	LOS A	1.6	39.5	0.06	0.54	0.06	34.0
4	T1	153	2.0	0.296	2.4	LOS A	1.6	39.5	0.06	0.54	0.06	32.8
14a	R1	2	2.0	0.296	3.2	LOS A	1.6	39.5	0.06	0.54	0.06	33.9
Approa	ach	508	2.0	0.296	6.8	LOS A	1.6	39.5	0.06	0.54	0.06	32.8
West:	EB I-80	Off-Ramp										
5	L2	83	2.0	0.317	6.8	LOS A	1.4	35.5	0.45	0.52	0.45	29.7
2	T1	2	2.0	0.317	1.7	LOS A	1.4	35.5	0.45	0.52	0.45	28.3
12a	R1	4	2.0	0.317	4.8	LOS A	1.4	35.5	0.45	0.52	0.45	30.5
12	R2	278	2.0	0.317	2.6	LOS A	1.4	35.5	0.45	0.52	0.45	28.4
12b	R3	11	32.0	0.317	6.5	LOS A	1.4	35.5	0.45	0.52	0.45	28.6
Approa	ach	378	2.9	0.317	3.6	LOS A	1.4	35.5	0.45	0.52	0.45	28.7
South\	West: EE	B McGary R	oad									
5ax	L1	3	2.0	0.007	12.0	LOS B	0.0	1.0	0.63	0.60	0.63	34.8
12ax	R1	1	2.0	0.007	6.5	LOS A	0.0	1.0	0.63	0.60	0.63	33.8
12x	R2	1	2.0	0.007	7.1	LOS A	0.0	1.0	0.63	0.60	0.63	34.0
12bx	R3	1	2.0	0.007	7.2	LOS A	0.0	1.0	0.63	0.60	0.63	33.5
Approa	ach	7	2.0	0.007	9.5	LOS A	0.0	1.0	0.63	0.60	0.63	34.3
All Veh	nicles	1124	2.3	0.317	5.2	LOSA	1.6	39.5	0.26	0.52	0.26	31.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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Site: 1 [2024 AM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG]

I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2024 AM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformanc	e - Vehi	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South:	: NB Hid	ldenbrooke F	Parkway									
3b	L3	1	2.0	0.447	13.2	LOS B	2.2	57.0	0.52	0.52	0.52	35.6
8	T1	429	2.0	0.447	4.4	LOS A	2.2	57.0	0.52	0.52	0.52	33.4
18	R2	92	2.0	0.447	4.9	LOS A	2.2	57.0	0.52	0.52	0.52	31.9
18b	R3	11	2.0	0.447	5.8	LOS A	2.2	57.0	0.52	0.52	0.52	33.4
Appro	ach	534	2.0	0.447	4.5	LOS A	2.2	57.0	0.52	0.52	0.52	33.1
South	East: Wl	B McGary R	oad									
3bx	L3	11	2.0	0.060	16.6	LOS C	0.4	9.1	0.75	0.73	0.75	35.1
3x	L2	1	2.0	0.060	15.3	LOS C	0.4	9.1	0.75	0.73	0.75	34.6
18ax	R1	25	2.0	0.060	8.5	LOS A	0.4	9.1	0.75	0.73	0.75	34.1
18bx	R3	8	2.0	0.060	9.3	LOS A	0.4	9.1	0.75	0.73	0.75	31.8
Appro	ach	45	2.0	0.060	10.8	LOS B	0.4	9.1	0.75	0.73	0.75	34.0
North:	SB Ame	erican Canyo	on Rd									
7	L2	380	2.0	0.272	8.7	LOS A	1.6	39.9	0.08	0.57	0.08	32.3
7a	L1	5	2.0	0.272	8.7	LOS A	1.6	39.9	0.08	0.57	0.08	33.5
4	T1	65	2.0	0.272	2.4	LOS A	1.6	39.9	0.08	0.57	0.08	32.3
14a	R1	5	2.0	0.272	3.2	LOS A	1.6	39.9	0.08	0.57	0.08	33.5
Appro	ach	457	2.0	0.272	7.7	LOS A	1.6	39.9	80.0	0.57	0.08	32.4
West:	EB I-80	Off-Ramp										
5	L2	109	2.0	0.187	6.4	LOS A	0.7	18.2	0.38	0.51	0.38	29.3
2	T1	11	2.0	0.187	1.2	LOS A	0.7	18.2	0.38	0.51	0.38	27.9
12a	R1	5	2.0	0.187	4.4	LOS A	0.7	18.2	0.38	0.51	0.38	30.1
12	R2	98	2.0	0.187	2.1	LOS A	0.7	18.2	0.38	0.51	0.38	28.0
12b	R3	5	32.0	0.187	5.9	LOS A	0.7	18.2	0.38	0.51	0.38	28.3
Appro	ach	228	2.7	0.187	4.3	LOS A	0.7	18.2	0.38	0.51	0.38	28.7
South	West: El	B McGary R	oad									
5ax	L1	9	2.0	0.012	10.7	LOS B	0.1	1.4	0.50	0.61	0.50	35.0
12ax	R1	2	2.0	0.012	5.2	LOS A	0.1	1.4	0.50	0.61	0.50	34.1
12x	R2	1	2.0	0.012	5.8	LOS A	0.1	1.4	0.50	0.61	0.50	34.2
12bx	R3	1	2.0	0.012	5.9	LOS A	0.1	1.4	0.50	0.61	0.50	33.7
Appro	ach	13	2.0	0.012	9.0	LOS A	0.1	1.4	0.50	0.61	0.50	34.7
All Vel	nicles	1276	2.1	0.447	5.9	LOSA	2.2	57.0	0.35	0.55	0.35	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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♥ Site: 1 [2024 PM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG]

I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2024 PM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformanc	e - Vehi	icles								
Mov ID	Turn	Demand Total veh/h		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South:	NB Hid	denbrooke F		<b>V</b> / <b>O</b>			7011					111511
3b	L3	1	2.0	0.219	12.7	LOS B	0.9	23.2	0.43	0.48	0.43	35.9
8	T1	191	2.0	0.219	3.9	LOS A	0.9	23.2	0.43	0.48	0.43	33.7
18	R2	59	2.0	0.219	4.4	LOS A	0.9	23.2	0.43	0.48	0.43	32.2
18b	R3	11	2.0	0.219	5.4	LOS A	0.9	23.2	0.43	0.48	0.43	33.7
Approa	ach	262	2.0	0.219	4.1	LOS A	0.9	23.2	0.43	0.48	0.43	33.4
South	East: WE	B McGary R	oad									
3bx	L3	11	2.0	0.033	13.7	LOS B	0.2	3.9	0.54	0.64	0.54	36.2
3x	L2	1	2.0	0.033	12.4	LOS B	0.2	3.9	0.54	0.64	0.54	35.7
18ax	R1	17	2.0	0.033	5.7	LOS A	0.2	3.9	0.54	0.64	0.54	35.2
18bx	R3	4	2.0	0.033	6.4	LOS A	0.2	3.9	0.54	0.64	0.54	32.9
Approa	ach	34	2.0	0.033	8.6	LOS A	0.2	3.9	0.54	0.64	0.54	35.2
North:	SB Ame	erican Canyo	on Rd									
7	L2	402	2.0	0.353	8.7	LOS A	2.1	52.6	0.08	0.53	0.08	32.8
7a	L1	1	2.0	0.353	8.7	LOS A	2.1	52.6	0.08	0.53	0.08	34.0
4	T1	191	2.0	0.353	2.4	LOS A	2.1	52.6	0.08	0.53	0.08	32.8
14a	R1	3	2.0	0.353	3.2	LOS A	2.1	52.6	0.08	0.53	0.08	33.9
Approa	ach	598	2.0	0.353	6.7	LOS A	2.1	52.6	0.08	0.53	0.08	32.8
West:	EB I-80	Off-Ramp										
5	L2	87	2.0	0.396	7.6	LOS A	2.0	51.2	0.55	0.60	0.55	29.5
2	T1	11	2.0	0.396	2.4	LOS A	2.0	51.2	0.55	0.60	0.55	28.1
12a	R1	5	2.0	0.396	5.5	LOS A	2.0	51.2	0.55	0.60	0.55	30.3
12	R2	329	2.0	0.396	3.3	LOS A	2.0	51.2	0.55	0.60	0.55	28.2
12b	R3	13	32.0	0.396	7.4	LOS A	2.0	51.2	0.55	0.60	0.55	28.5
Approa	ach	446	2.9	0.396	4.2	LOS A	2.0	51.2	0.55	0.60	0.55	28.5
South\	Nest: EE	B McGary R	oad									
5ax	L1	9	2.0	0.017	13.8	LOS B	0.1	2.6	0.74	0.67	0.74	33.5
12ax	R1	2	2.0	0.017	8.4	LOS A	0.1	2.6	0.74	0.67	0.74	32.4
12x	R2	1	2.0	0.017	9.0	LOS A	0.1	2.6	0.74	0.67	0.74	32.8
12bx	R3	1	2.0	0.017	9.1	LOS A	0.1	2.6	0.74	0.67	0.74	32.3
Approa	ach	13	2.0	0.017	12.1	LOS B	0.1	2.6	0.74	0.67	0.74	33.2
All Veh	nicles	1352	2.3	0.396	5.5	LOSA	2.1	52.6	0.32	0.55	0.32	31.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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♥ Site: 1 [2035 AM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG]

I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2035 AM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformanc	e - Vehi	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South:	NB Hid	denbrooke F										
3b	L3	2	2.0	0.467	14.4	LOS B	2.7	69.8	0.61	0.67	0.65	35.2
8	T1	400	2.0	0.467	5.6	LOS A	2.7	69.8	0.61	0.67	0.65	33.1
18	R2	110	2.0	0.467	6.1	LOS A	2.7	69.8	0.61	0.67	0.65	31.5
18b	R3	7	2.0	0.467	7.1	LOS A	2.7	69.8	0.61	0.67	0.65	33.1
Approa	ach	518	2.0	0.467	5.7	LOS A	2.7	69.8	0.61	0.67	0.65	32.8
South	East: WE	B McGary R	oad									
3bx	L3	3	2.0	0.059	18.8	LOS C	0.4	9.7	0.83	0.75	0.83	34.5
3x	L2	1	2.0	0.059	17.5	LOS C	0.4	9.7	0.83	0.75	0.83	34.1
18ax	R1	26	2.0	0.059	10.7	LOS B	0.4	9.7	0.83	0.75	0.83	33.6
18bx	R3	7	2.0	0.059	11.5	LOS B	0.4	9.7	0.83	0.75	0.83	31.2
Approa	ach	37	2.0	0.059	11.8	LOS B	0.4	9.7	0.83	0.75	0.83	33.3
North:	SB Ame	erican Canyo	on Rd									
7	L2	580	2.0	0.369	8.7	LOS A	2.3	58.1	0.06	0.59	0.06	32.1
7a	L1	4	2.0	0.369	8.7	LOS A	2.3	58.1	0.06	0.59	0.06	33.3
4	T1	51	2.0	0.369	2.4	LOS A	2.3	58.1	0.06	0.59	0.06	32.2
14a	R1	4	2.0	0.369	3.2	LOS A	2.3	58.1	0.06	0.59	0.06	33.3
Approa	ach	640	2.0	0.369	8.1	LOS A	2.3	58.1	0.06	0.59	0.06	32.2
West:	EB I-80	Off-Ramp										
5	L2	49	2.0	0.136	7.2	LOS A	0.6	14.9	0.48	0.55	0.48	29.6
2	T1	5	2.0	0.136	2.0	LOS A	0.6	14.9	0.48	0.55	0.48	28.2
12a	R1	7	2.0	0.136	5.2	LOS A	0.6	14.9	0.48	0.55	0.48	30.3
12	R2	83	2.0	0.136	2.9	LOS A	0.6	14.9	0.48	0.55	0.48	28.2
12b	R3	7	32.0	0.136	6.9	LOS A	0.6	14.9	0.48	0.55	0.48	28.5
Approa	ach	150	3.3	0.136	4.6	LOS A	0.6	14.9	0.48	0.55	0.48	28.8
South\	West: EE	B McGary R	oad									
5ax	L1	9	2.0	0.013	11.3	LOS B	0.1	1.5	0.55	0.62	0.55	34.8
12ax	R1	2	2.0	0.013	5.8	LOS A	0.1	1.5	0.55	0.62	0.55	33.8
12x	R2	1	2.0	0.013	6.4	LOS A	0.1	1.5	0.55	0.62	0.55	33.9
12bx	R3	1	2.0	0.013	6.5	LOS A	0.1	1.5	0.55	0.62	0.55	33.5
Approa	ach	13	2.0	0.013	9.6	LOS A	0.1	1.5	0.55	0.62	0.55	34.4
All Veh	nicles	1359	2.1	0.467	6.9	LOS A	2.7	69.8	0.34	0.62	0.36	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

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

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♥ Site: 1 [2035 PM PH I-80 Ramps-Hiddenbrooke Pkwy-McGary Rd (SIDRA) DG]

I-80 Ramps/Hiddenbrooke Parkway/McGary Road 2035 PM Peak Hour (DG) Single-Lane, 6-Leg (SIDRA) Site Category: (None) Roundabout

Move	ment P	erformanc	e - Vehi	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South:	: NB Hid	denbrooke F	Parkway									
3b	L3	1	2.0	0.211	13.1	LOS B	0.9	23.9	0.49	0.52	0.49	35.7
8	T1	180	2.0	0.211	4.3	LOS A	0.9	23.9	0.49	0.52	0.49	33.5
18	R2	54	2.0	0.211	4.8	LOS A	0.9	23.9	0.49	0.52	0.49	31.9
18b	R3	3	2.0	0.211	5.8	LOS A	0.9	23.9	0.49	0.52	0.49	33.5
Appro	ach	239	2.0	0.211	4.5	LOS A	0.9	23.9	0.49	0.52	0.49	33.2
South	East: Wl	B McGary R	oad									
3bx	L3	7	2.0	0.019	14.1	LOS B	0.1	2.4	0.58	0.63	0.58	35.8
3x	L2	1	2.0	0.019	12.9	LOS B	0.1	2.4	0.58	0.63	0.58	35.3
18ax	R1	9	2.0	0.019	6.1	LOS A	0.1	2.4	0.58	0.63	0.58	34.8
18bx	R3	2	2.0	0.019	6.8	LOS A	0.1	2.4	0.58	0.63	0.58	32.5
Appro	ach	18	2.0	0.019	9.4	LOS A	0.1	2.4	0.58	0.63	0.58	34.9
North:	SB Ame	erican Canyo	on Rd									
7	L2	447	2.0	0.383	8.7	LOS A	2.4	59.7	0.07	0.54	0.07	32.9
7a	L1	4	2.0	0.383	8.7	LOS A	2.4	59.7	0.07	0.54	0.07	34.0
4	T1	199	2.0	0.383	2.4	LOS A	2.4	59.7	0.07	0.54	0.07	32.8
14a	R1	9	2.0	0.383	3.2	LOS A	2.4	59.7	0.07	0.54	0.07	34.0
Appro	ach	659	2.0	0.383	6.7	LOS A	2.4	59.7	0.07	0.54	0.07	32.9
West:	EB I-80	Off-Ramp										
5	L2	116	2.0	0.401	8.0	LOS A	2.1	53.7	0.59	0.65	0.59	29.3
2	T1	5	2.0	0.401	2.8	LOS A	2.1	53.7	0.59	0.65	0.59	27.8
12a	R1	7	2.0	0.401	5.9	LOS A	2.1	53.7	0.59	0.65	0.59	30.0
12	R2	295	2.0	0.401	3.7	LOS A	2.1	53.7	0.59	0.65	0.59	27.9
12b	R3	13	32.0	0.401	7.9	LOS A	2.1	53.7	0.59	0.65	0.59	28.2
Appro	ach	436	2.9	0.401	5.0	LOS A	2.1	53.7	0.59	0.65	0.59	28.3
South	West: El	B McGary R	oad									
5ax	L1	16	2.0	0.033	14.6	LOS B	0.2	5.2	0.77	0.72	0.77	33.2
12ax	R1	5	2.0	0.033	9.1	LOS A	0.2	5.2	0.77	0.72	0.77	32.0
12x	R2	1	2.0	0.033	9.7	LOS A	0.2	5.2	0.77	0.72	0.77	32.4
12bx	R3	1	2.0	0.033	9.8	LOS A	0.2	5.2	0.77	0.72	0.77	32.0
Appro	ach	24	2.0	0.033	12.9	LOS B	0.2	5.2	0.77	0.72	0.77	32.8
All Vel	nicles	1376	2.3	0.401	5.9	LOSA	2.4	59.7	0.32	0.57	0.32	31.5

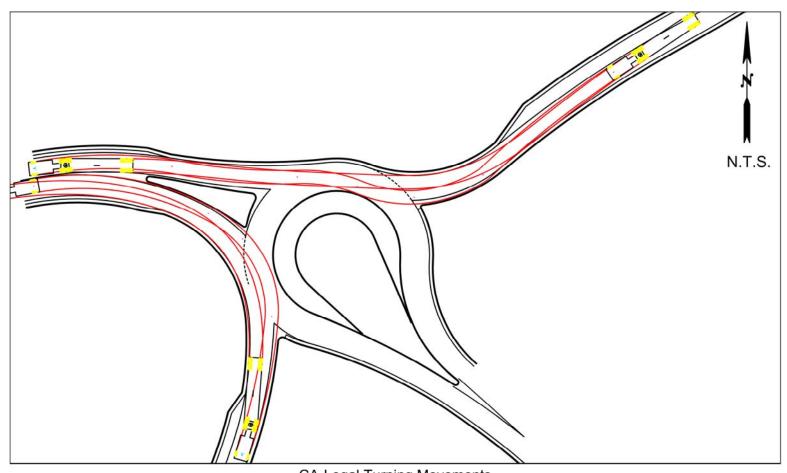
Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

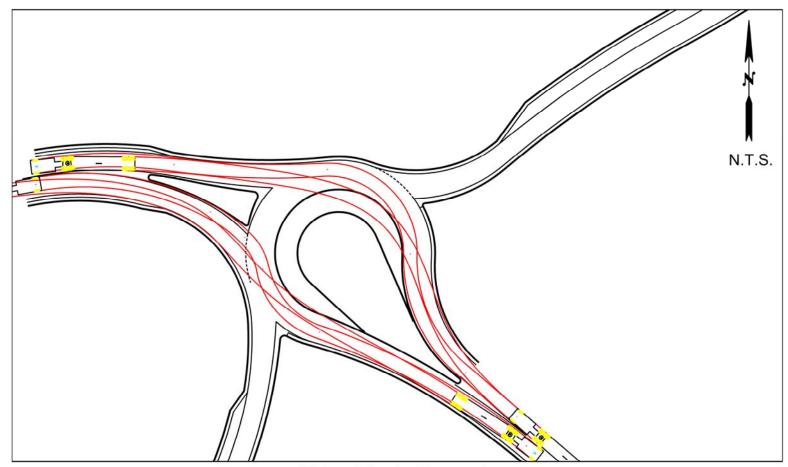
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: REID MIDDLETON INC | Processed: Friday, June 26, 2020 10:39:44 AM
Project: H:\25St\15\015 I-80 and Hiddenbrooke RB (Fehr and Peers)\Traffic\I-80 - Hiddenbrooke Parkway Interchange\_wrm.sip8

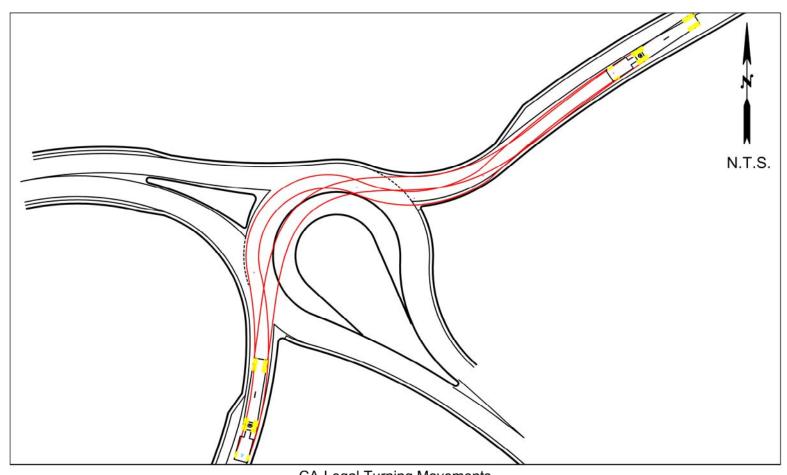
# APPENDIX B (ROUNDABOUT SUPPORTING FIGURES)



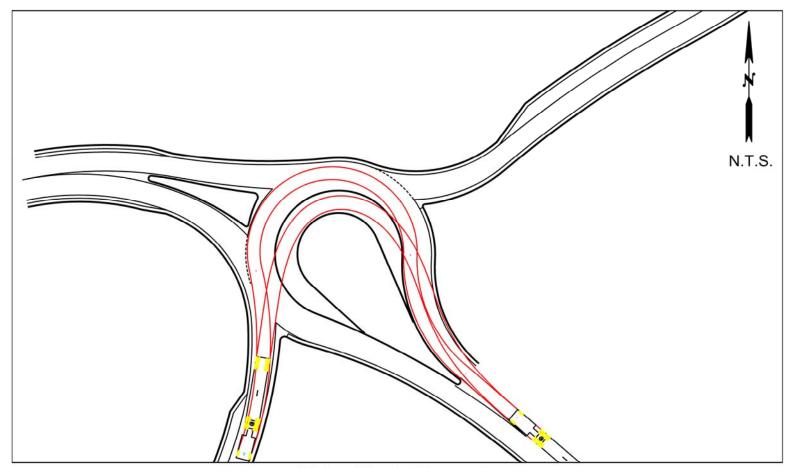
**CA-Legal Turning Movements** 



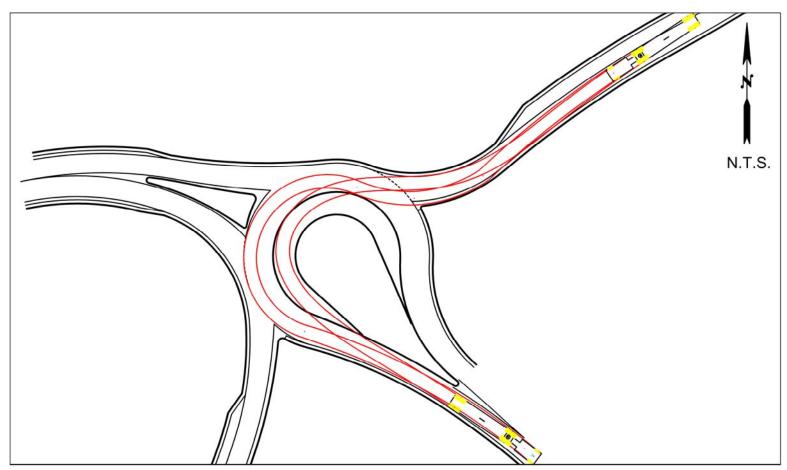
**CA-Legal Turning Movements** 



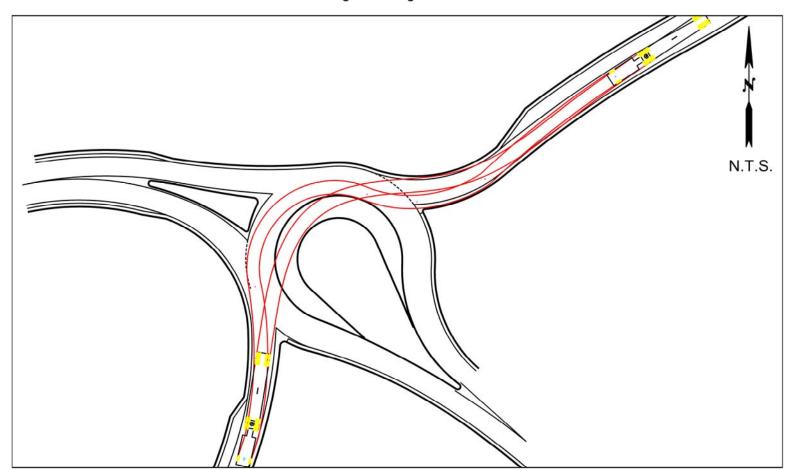
**CA-Legal Turning Movements** 



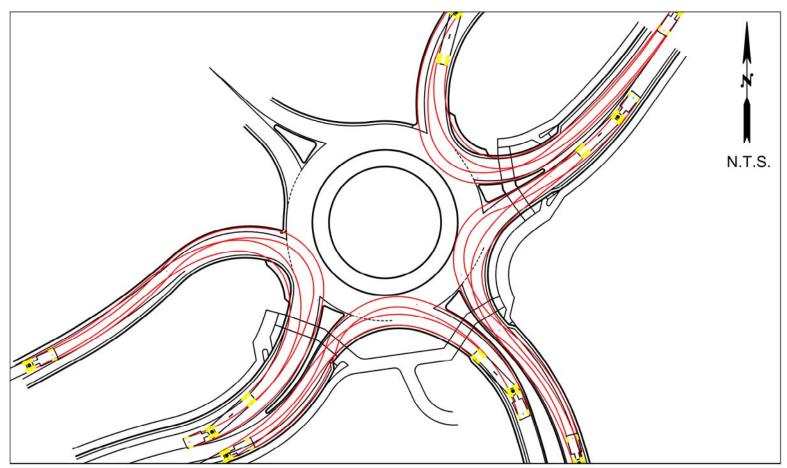
**CA-Legal Turning Movements** 



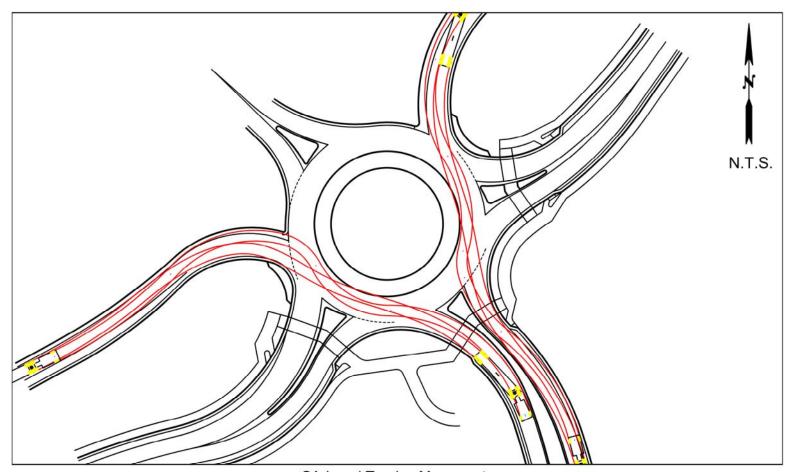
**CA-Legal Turning Movements** 



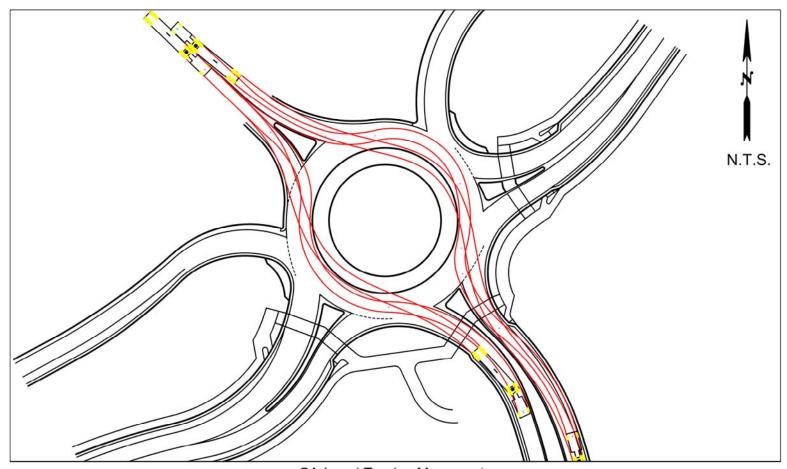
STAA Standard Turning Movements



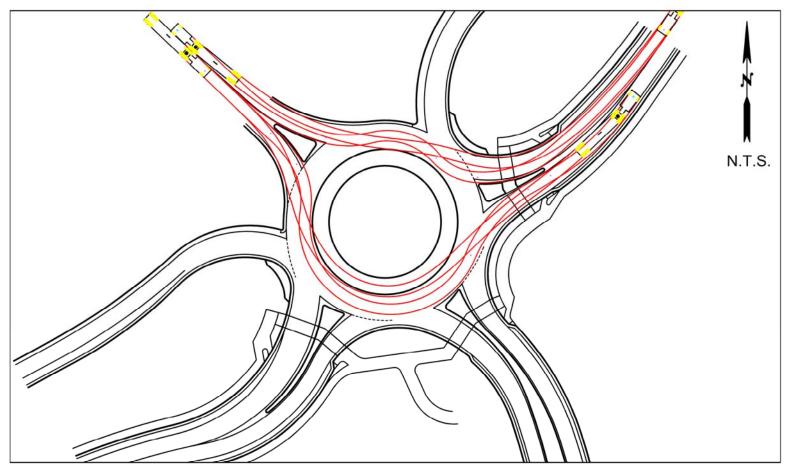
**CA-Legal Turning Movements** 



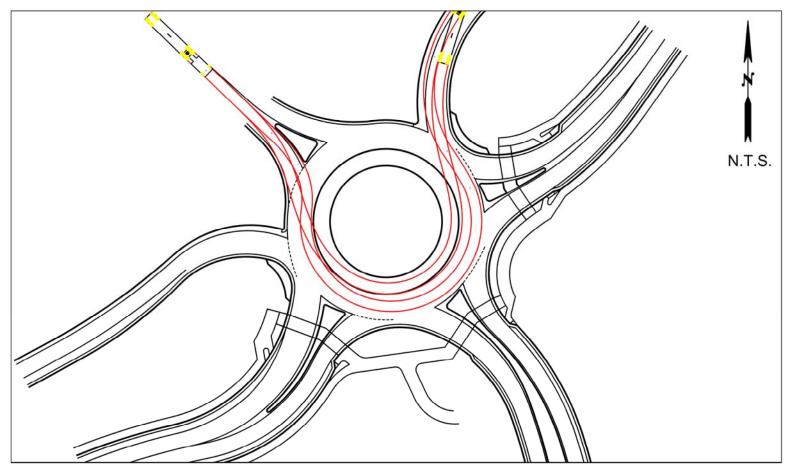
**CA-Legal Turning Movements** 



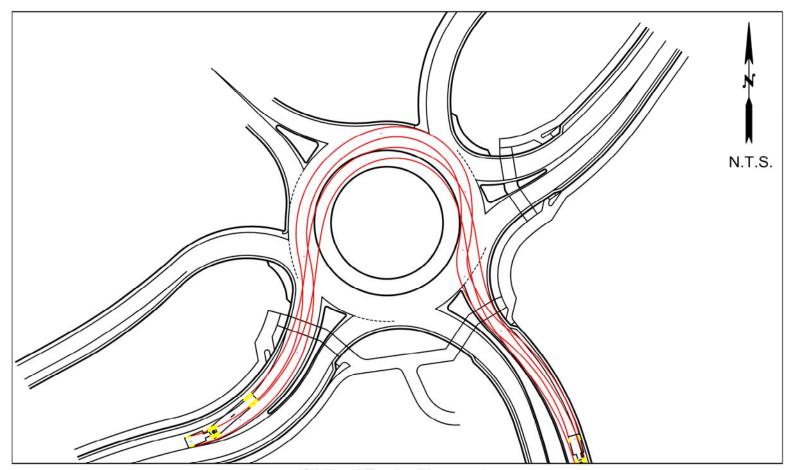
**CA-Legal Turning Movements** 



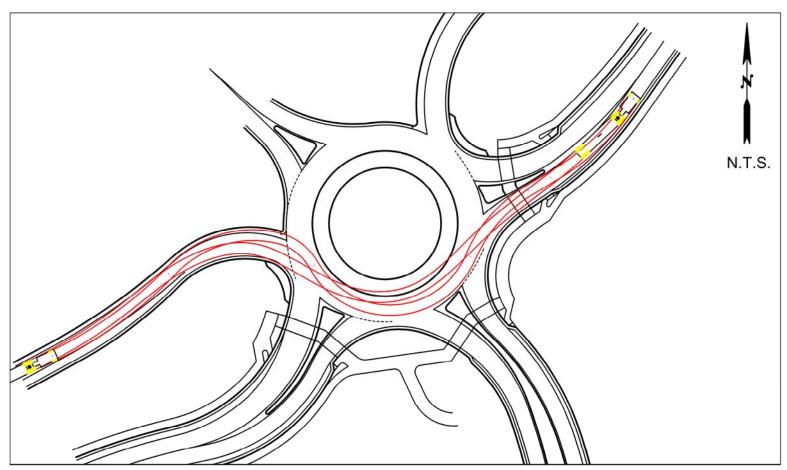
**CA-Legal Turning Movements** 



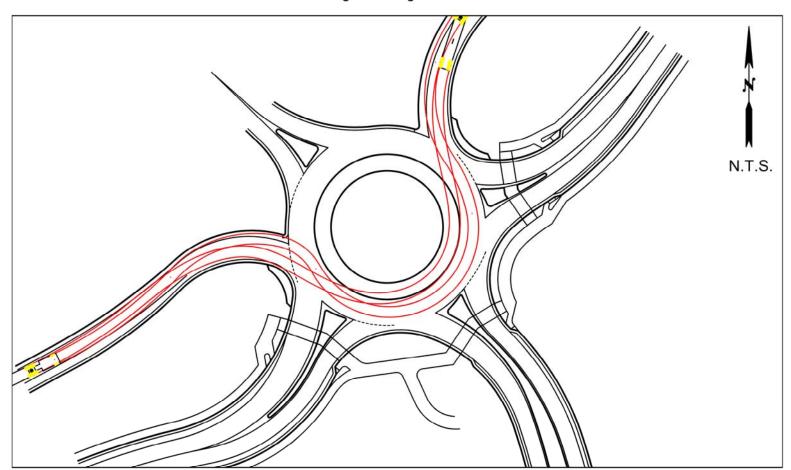
**CA-Legal Turning Movements** 



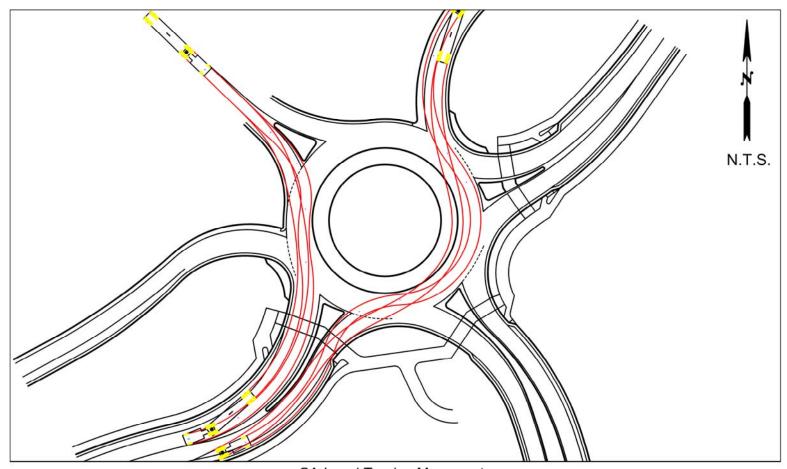
**CA-Legal Turning Movements** 



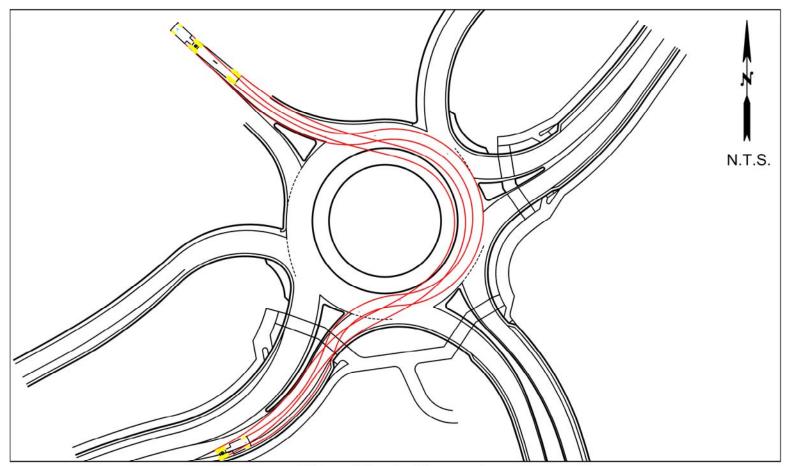
**CA-Legal Turning Movements** 



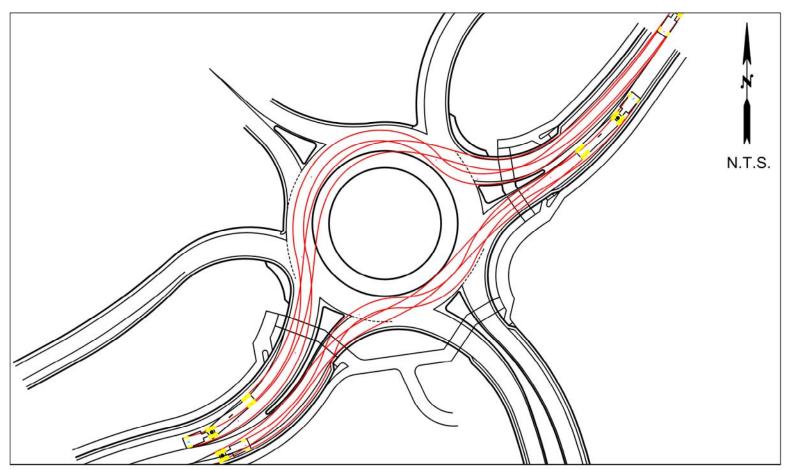
**CA-Legal Turning Movements** 



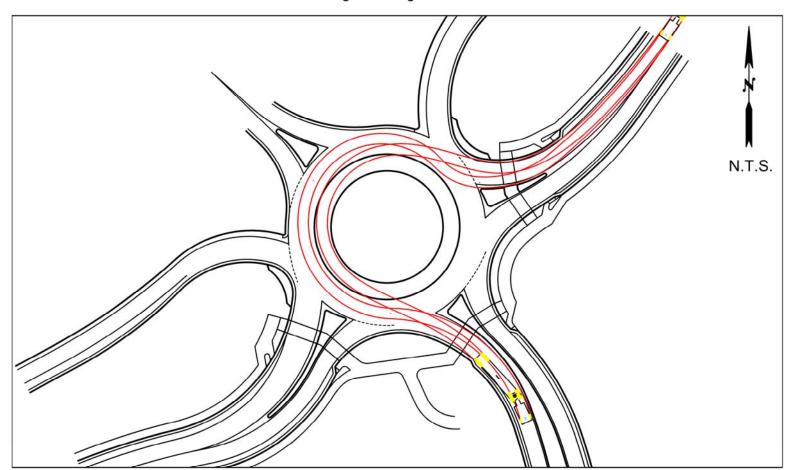
**CA-Legal Turning Movements** 



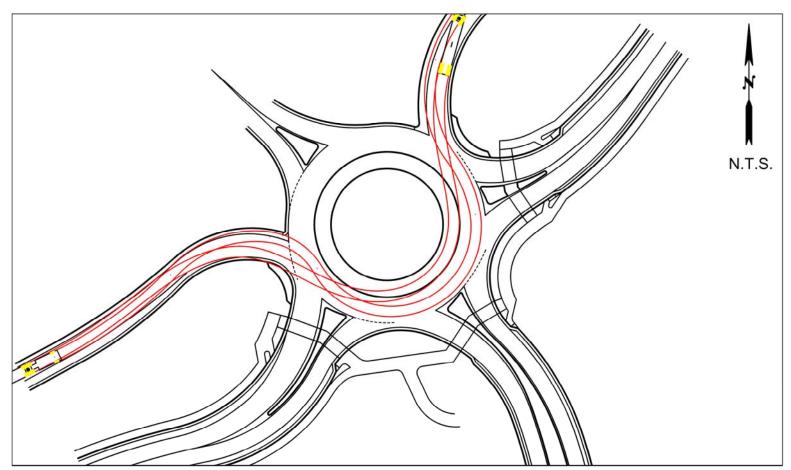
**CA-Legal Turning Movements** 



**CA-Legal Turning Movements** 

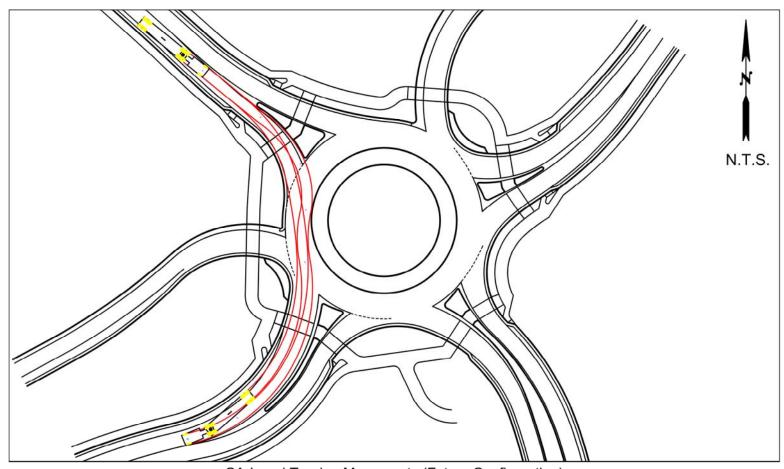


**CA-Legal Turning Movements** 

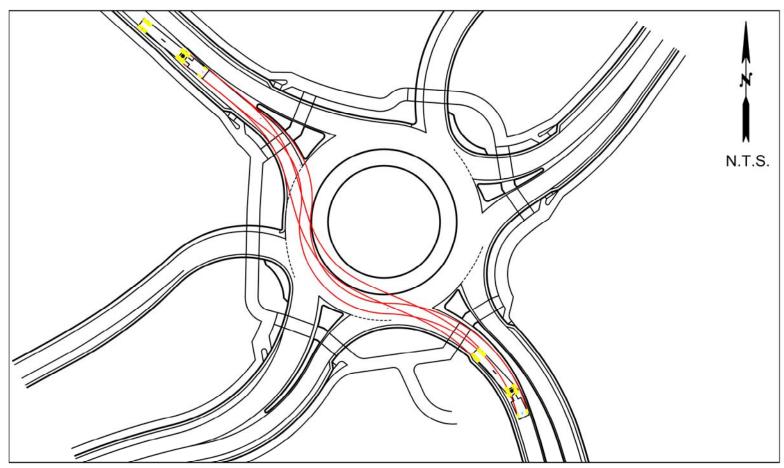


STAA Standard Turning Movements

June 2020

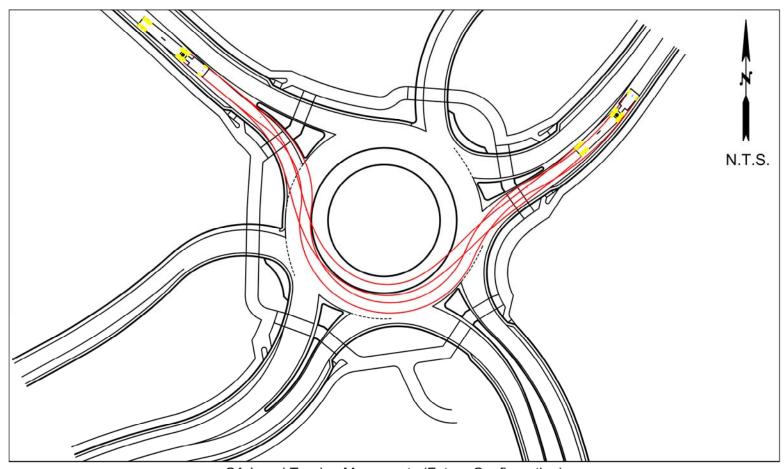


CA-Legal Turning Movements (Future Configuration)

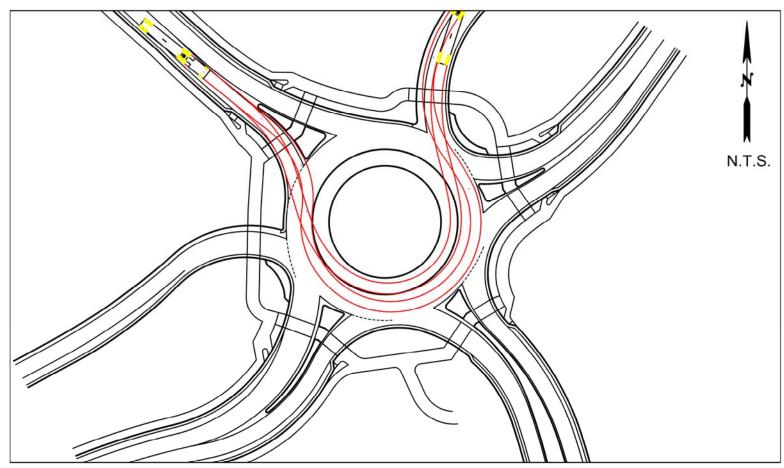


CA-Legal Turning Movements (Future Configuration)

I-80/Hiddenbrooke Interchange Roundabouts - TRUCK TURNING



CA-Legal Turning Movements (Future Configuration)



CA-Legal Turning Movements (Future Configuration)

I-80/Hiddenbrooke Interchange Roundabouts - TRUCK TURNING

June 2020

#### I-80/Hiddenbrooke Interchange Roundabouts

#### **I-80 Westbound Roundabout**

Vallejo, CA January 2016

Southbound Westbound Northbound Radius (ft) | Speed (mph) | Radius (ft) | Speed (mph) | Radius (ft) | Speed (mph) R1 23 153 24 139 139 23 25 R2 64 16 190 59 16 R3\* 25 25 R4 45 15 45 15 R5 100 21 174 25

Calculated R3 Speed from Acceleration and Distance to Crosswalk FHWA Acceleration 6.9 ft/sec<sup>2</sup> NCHRP Report 572

	Beginning Speed R2 (MPH)	R2 Speed in FT/SEC	Distance from R2 to Crosswalk (ft)	Approx. Travel Time (sec)	Speed Increase (mph)	Exiting Speed (mph)
Northbound	16	23	45	1.9	9	25
Westbound	16	23	43	1.8	9	25

<sup>\*</sup> R3 speed = lesser of [speed-radius table value] or [R2+Acceleration\*Distance to Crosswalk)

<sup>+2%</sup> superelevation assumed for R1, R3, and R5 movements

<sup>-2%</sup> superelevation assumed for R2 and R4 movements

## I-80/Hiddenbrooke Interchange Roundabouts

#### **I-80 Eastbound Roundabout**

Vallejo, CA January 2016

	North	bound	South	nbound	Eastl	oound	West	bound	Northe	astbound
	Radius (ft)	Speed (mph)								
R1	116	22	139	23	102	21	103	21	131	23
R2	86	19	93	19	80	18	74	17	79	19
R3*	-	-	-	26	-	25	-	24	-	25
R4	62	16	62	16	62	16	62	16	62	16
R5	69	18	153	24	58	17	60	17	85	20

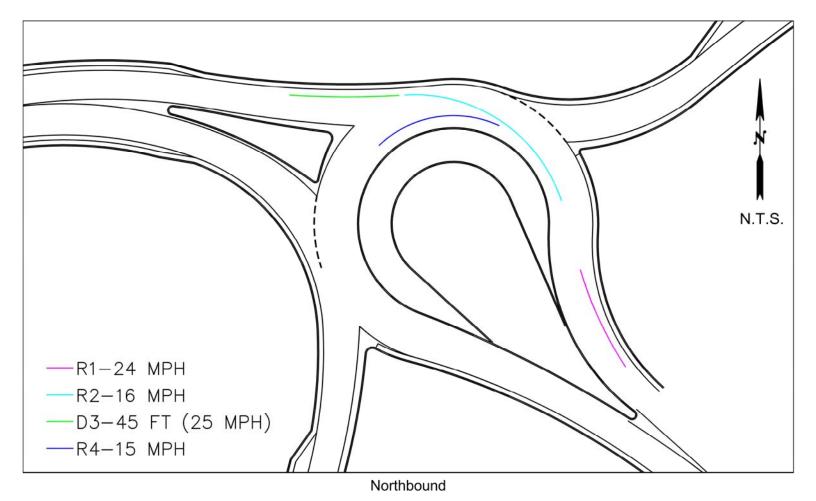
<sup>\*</sup> R3 speed = lesser of [speed-radius table value] or [R2+Acceleration\*Distance to Crosswalk)

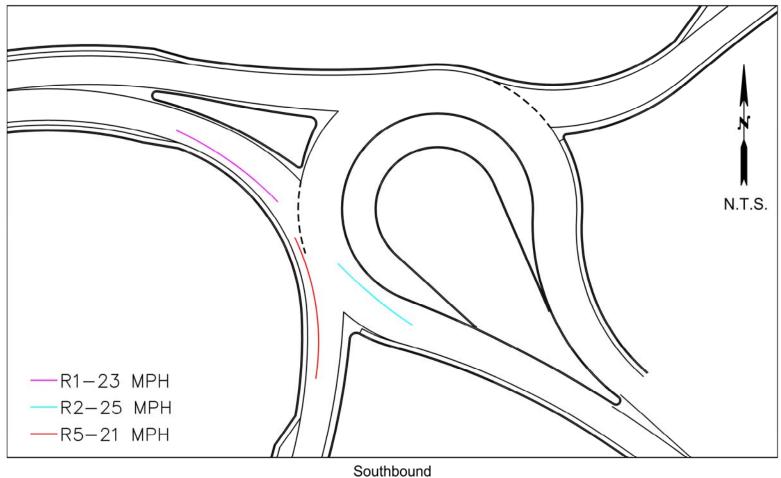
Calculated R3 Speed from Acceleration and Distance to Crosswalk FHWA Acceleration 6.9 ft/sec<sup>2</sup> NCHRP Report 572

	Beginning Speed R2 (MPH)	R2 Speed in FT/SEC	Distance from R2 to Crosswalk (ft)	Approx. Travel Time (sec)	Speed Increase (mph)	Exiting Speed (mph)
Southbound	19	28	43	1.6	7	26
Eastbound	18	26	41	1.6	7	25
Westbound	17	25	39	1.6	7	24
Northeastbound	19	28	34	1.2	6	25

<sup>+2%</sup> superelevation assumed for R1, R3, and R5 movements

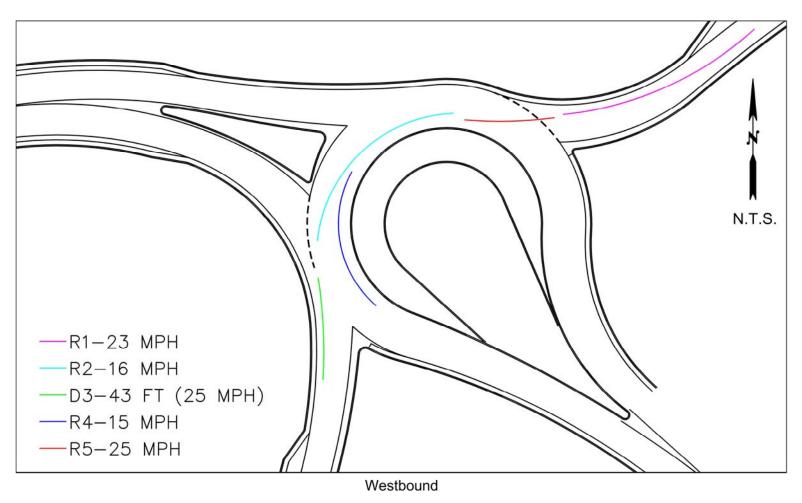
<sup>-2%</sup> superelevation assumed for R2 and R4 movements

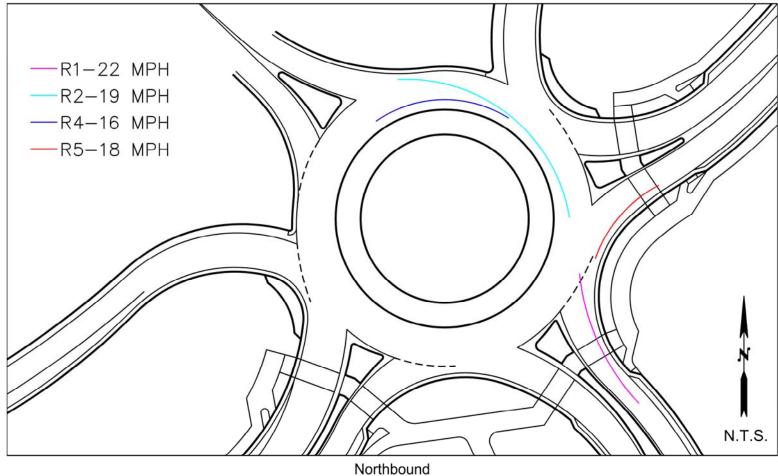




I-80/Hiddenbrooke Interchange Roundabouts - SPEED CURVES

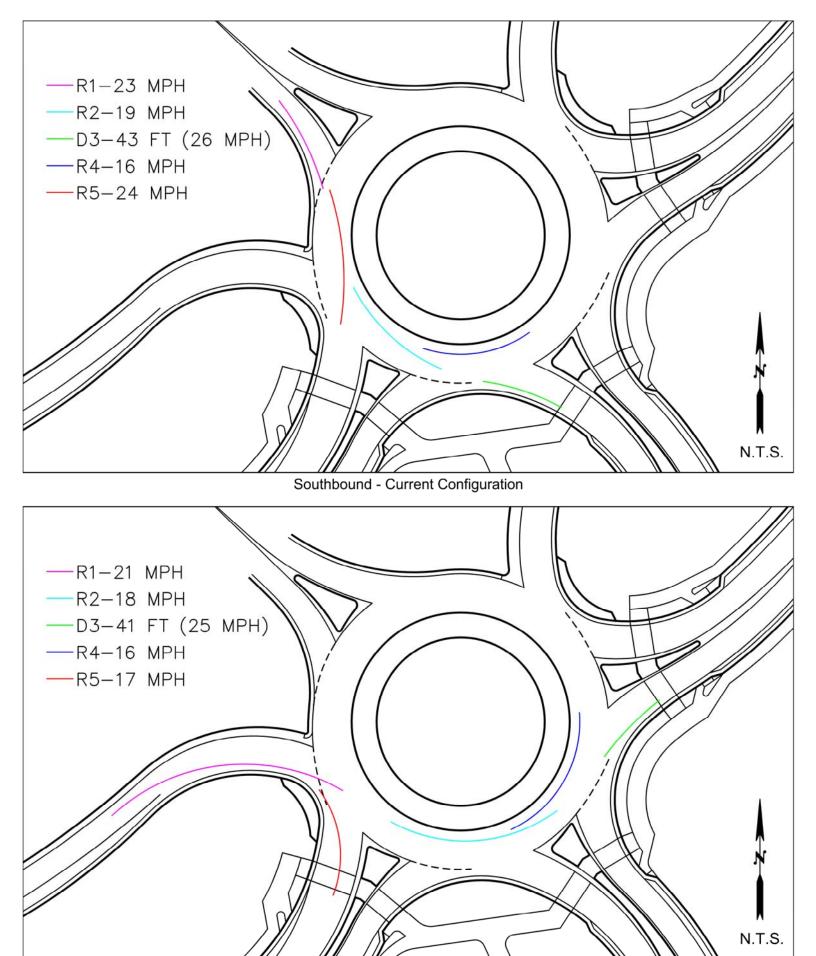
Figure B-15 June 2020





I-80/Hiddenbrooke Interchange Roundabouts - SPEED CURVES

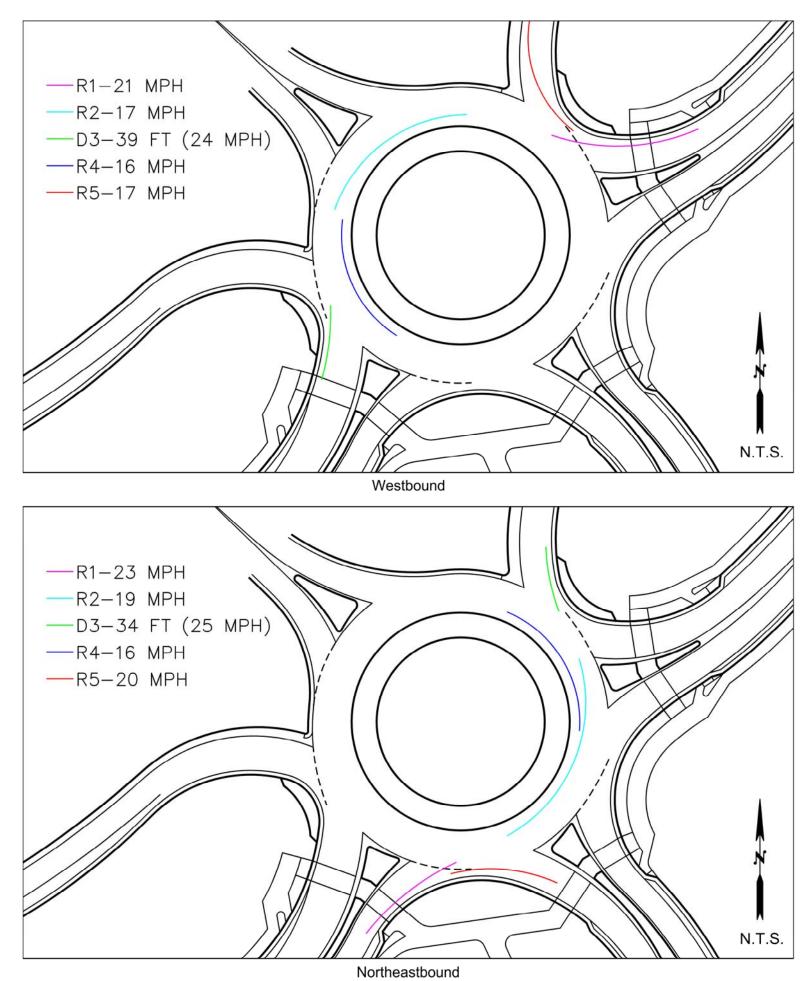
Figure B-16 June 2020



I-80/Hiddenbrooke Interchange Roundabouts - SPEED CURVES

Eastbound

Figure B-17 June 2020



I-80/Hiddenbrooke Interchange Roundabouts - SPEED CURVES

Figure B-18 June 2020

## I-80/Hiddenbrooke Interchange Roundabouts

I-80 Eastbound Roundabout - Future Configuration Vallejo, CA January 2016

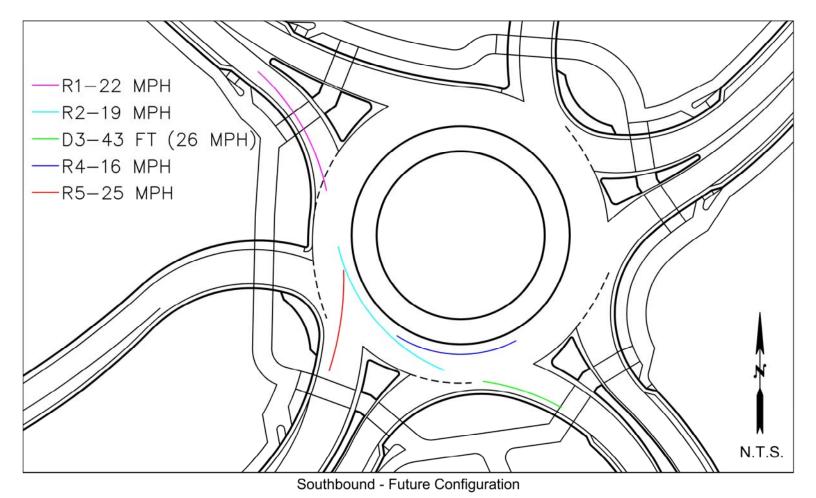
#### Southbound

	Radius (ft)	Speed (mph)
R1	116	22
R2	93	19
R3*	-	26
R4	62	16
R5	155	25

- \* R3 speed = lesser of [speed-radius table value] or [R2+Acceleration\*Distance to Crosswalk)
- +2% superelevation assumed for R1, R3, and R5 movements
- -2% superelevation assumed for R2 and R4 movements

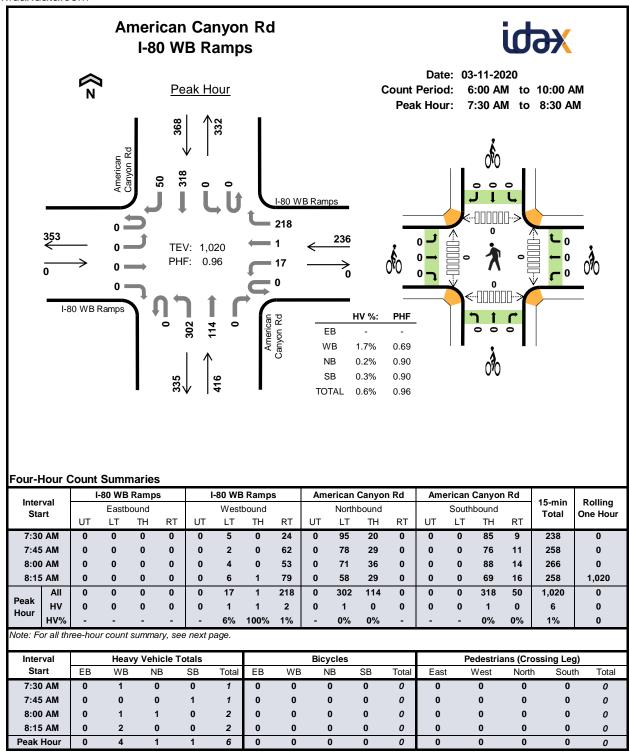
Calculated R3 Speed from Acceleration and Distance to Crosswalk FHWA Acceleration 6.9 ft/sec<sup>2</sup> NCHRP Report 572

	Beginning Speed R2 (MPH)	R2 Speed in FT/SEC	Distance from R2 to Crosswalk (ft)	Approx. Travel Time (sec)	Speed Increase (mph)	Exiting Speed (mph)
Southbound	19	28	43	1.6	7	26



June 2020

# **Appendix B:** Counts



	_	ŀ	-80 WB	Ramp	s	I	-80 WE	3 Ramps	3	Am	erican (	Canyor	n Rd	Ame	erican	Canyor	n Rd		
Inte			Eastb	ound			West	bound			North	bound			South	bound		15-min	Rolling
Sta	irt	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One Hour
6:00	) AM	0	0	0	0	0	1	1	45	0	24	14	0	0	0	35	2	122	0
6:15	AM.	0	0	0	0	0	0	0	19	0	35	14	0	0	0	44	1	113	0
6:30	) AM	0	0	0	0	0	1	0	10	0	37	17	0	0	0	47	3	115	0
6:45	AM.	0	0	0	0	0	1	0	15	0	40	12	0	0	0	57	6	131	481
7:00	) AM	0	0	0	0	0	1	0	16	0	36	14	0	0	0	51	4	122	481
7:15	AM.	0	0	0	0	0	2	1	18	0	58	21	0	0	0	68	10	178	546
7:30	AM (	0	0	0	0	0	5	0	24	0	95	20	0	0	0	85	9	238	669
7:45	AM	0	0	0	0	0	2	0	62	0	78	29	0	0	0	76	11	258	796
8:00	AM	0	0	0	0	0	4	0	53	0	71	36	0	0	0	88	14	266	940
8:15	AM	0	0	0	0	0	6	1	79	0	58	29	0	0	0	69	16	258	1,020
8:30	) AM	0	0	0	0	0	5	1	79	0	44	23	0	0	0	72	14	238	1,020
8:45	S AM	0	0	0	0	0	8	1	75	0	38	21	0	0	0	63	10	216	978
9:00	) AM	0	0	0	0	0	10	1	60	0	41	20	0	0	0	52	7	191	903
9:15	AM.	0	0	0	0	0	13	0	52	0	37	26	0	0	0	47	5	180	825
9:30	) AM	0	0	0	0	0	5	0	49	0	51	17	0	0	0	64	7	193	780
9:45	AM.	0	0	0	0	0	8	2	49	0	47	23	0	0	0	49	7	185	749
Count	Total	0	0	0	0	0	72	8	705	0	790	336	0	0	0	967	126	3,004	0
D I.	All	0	0	0	0	0	17	1	218	0	302	114	0	0	0	318	50	1,020	0
Peak Hour	HV	0	0	0	0	0	1	1	2	0	1	0	0	0	0	1	0	6	0
rioui	HV%	-		-	-	-	6%	100%	1%	-	0%	0%	-	-	-	0%	0%	1%	0

Note: Four-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval		Heavy	Vehicle	Totals				Bicycles				Pedestria	ans (Cross	ing Leg)	
Start	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	2	0	1	3	0	0	1	0	1	0	0	0	0	0
9:45 AM	0	2	3	1	6	0	0	1	0	1	0	0	0	0	0
Count Total	0	15	4	8	27	0	0	2	0	2	0	0	0	0	0
Peak Hour	0	4	1	1	6	0	0	0	0	0	0	0	0	0	0

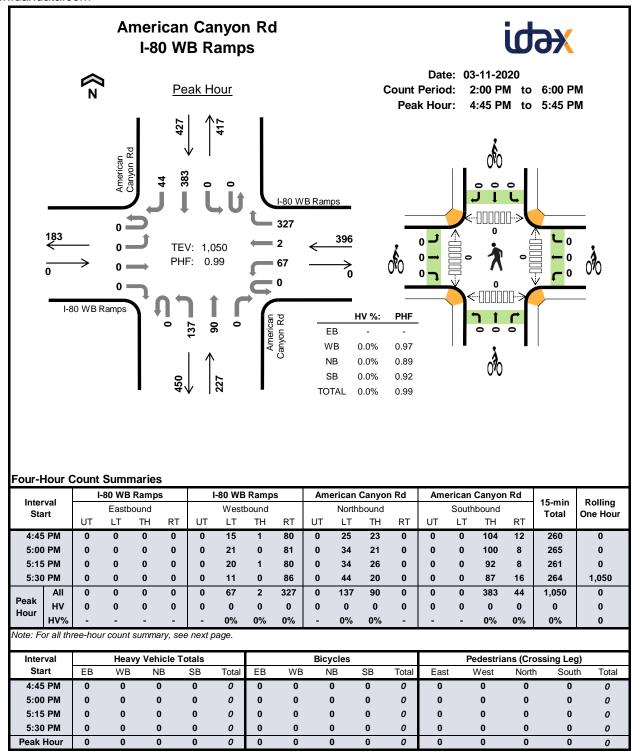
	ŀ	-80 WB	Ramp	s	1	-80 WB	Ramp	s	Ame	erican	Canyor	n Rd	Ame	erican	Canyor	n Rd		
Interval Start		Eastb	ound			Westl	bound			North	bound			South	bound		15-min Total	Rolling One Hour
Otart	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One riou
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	3
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	4
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
8:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	5
8:15 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	6
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2	7
8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	7
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6
9:15 AM	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	3	7
9:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	3	8
9:45 AM	0	0	0	0	0	1	0	1	0	3	0	0	0	0	1	0	6	13
Count Total	0	0	0	0	0	3	1	11	0	4	0	0	0	0	8	0	27	0
Peak Hour	0	0	0	0	0	1	1	2	0	1	0	0	0	0	1	0	6	0

#### Four-Hour Count Summaries - Bikes

	I-80	) WB Rar	nps	I-80	) WB Rar	nps	Ameri	can Can	yon Rd	Ameri	can Can	yon Rd	45 .	- ···
Interval Start	Е	Eastboun	d	V	Vestboun	ıd	N	lorthbour	nd	S	outhbour	nd	15-min Total	Rolling One Hour
Glart	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	i otai	One riou
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	1
9:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Count Total	0	0	0	0	0	0	0	2	0	0	0	0	2	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Project Manager: (415) 310-6469



1		ŀ	-80 WB	Ramp	s	ı	-80 WB	Ramp	s	Am	erican	Canyor	n Rd	Amo	erican	Canyon	Rd	45	D - 111
Inter Sta			Eastb	ound			Westh	oound			North	bound			South	bound		15-min Total	Rolling One Hour
Sia	II L	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One nour
2:00	PM	0	0	0	0	0	13	0	55	0	40	31	0	0	0	79	9	227	0
2:15	PM	0	0	0	0	0	6	0	54	0	35	17	0	0	0	64	7	183	0
2:30	PM	0	0	0	0	0	12	0	60	0	33	30	0	0	0	76	10	221	0
2:45	PM.	0	0	0	0	0	11	0	56	0	45	20	0	0	0	74	23	229	860
3:00	PM (	0	0	0	0	0	13	0	72	0	35	24	0	0	0	64	16	224	857
3:15	PM.	0	0	0	0	0	9	0	68	0	34	22	0	0	0	77	13	223	897
3:30	PM (	0	0	0	0	0	8	0	79	0	37	22	0	0	0	91	16	253	929
3:45	PM.	0	0	0	0	0	12	0	70	0	40	26	0	0	0	96	13	257	957
4:00	PM (	0	0	0	0	0	7	2	61	0	33	17	0	0	0	102	15	237	970
4:15	PM.	0	0	0	0	0	16	0	82	0	31	16	0	0	0	73	18	236	983
4:30	PM (	0	0	0	0	0	14	1	89	0	29	16	0	0	0	76	17	242	972
4:45	PM	0	0	0	0	0	15	1	80	0	25	23	0	0	0	104	12	260	975
5:00	PM	0	0	0	0	0	21	0	81	0	34	21	0	0	0	100	8	265	1,003
5:15	PM	0	0	0	0	0	20	1	80	0	34	26	0	0	0	92	8	261	1,028
5:30	PM	0	0	0	0	0	11	0	86	0	44	20	0	0	0	87	16	264	1,050
5:45	PM	0	0	0	0	0	18	0	74	0	26	24	0	0	0	90	9	241	1,031
Count	Total	0	0	0	0	0	206	5	1,147	0	555	355	0	0	0	1,345	210	3,823	0
Peak	All	0	0	0	0	0	67	2	327	0	137	90	0	0	0	383	44	1,050	0
Peak Hour	HV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HV%	-	-	-	-	-	0%	0%	0%	-	0%	0%	-	-	-	0%	0%	0%	0

Note: Four-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

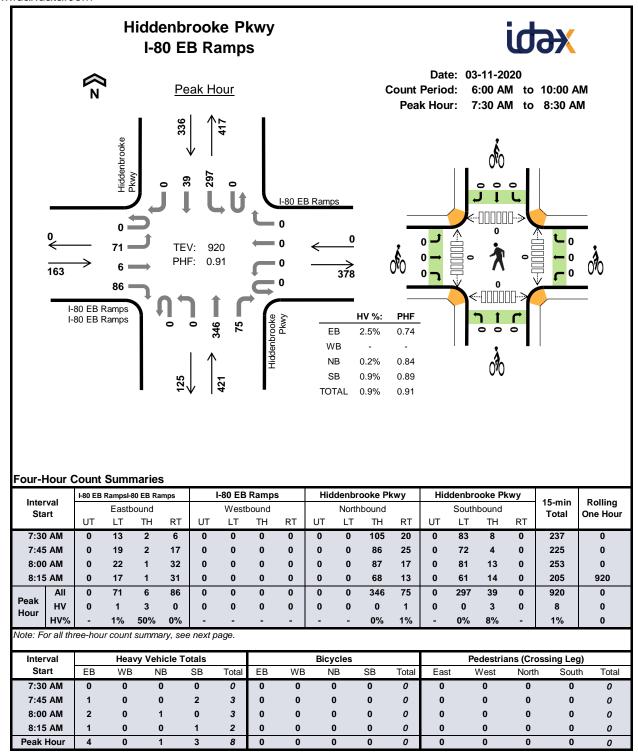
Interval		Heavy	Vehicle	Totals				Bicycles				Pedestria	ans (Cross	ing Leg)	
Start	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
2:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	1	9	4	14	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

lata a sal	Į.	-80 WB	Ramp	s	ı	-80 WB	Ramp	s	Am	erican	Canyor	n Rd	Ame	erican	Canyor	ı Rd	45	D - 111
Interval Start		Eastb	oound			Westl	bound			North	bound			South	bound		15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	. • • • •	0.10 1.10
2:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	0
2:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	7
3:00 PM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	7
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
3:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	5
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	4
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	1	0	6	3	0	0	0	3	1	14	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

#### Four-Hour Count Summaries - Bikes

lest a moral	I-80	) WB Rar	nps	I-80	) WB Rar	nps	Ameri	can Can	yon Rd	Ameri	can Can	yon Rd	45	D. III.
Interval Start	Е	Eastboun	d	V	Vestboun	d	N	lorthbour	nd	S	outhbour	nd	15-min Total	Rolling One Hour
<b>5.</b>	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	. • • • •	0.10 1.10 4.1
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



I1		I-80 EB	Rampsl-	80 EB Ra	mps		I-80 EB	Ramps	S	Hid	denbro	ooke Pk	кwy	Hic	ldenbro	oke Pk	wy	45	D - 111
Inter Sta			Easth	oound			West	oound			North	bound			South	bound		15-min Total	Rolling One Hour
Sia		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One nour
6:00	AM	0	5	1	5	0	0	0	0	0	0	34	2	0	35	1	0	83	0
6:15	AM	0	10	1	8	0	0	0	0	0	0	41	7	0	43	1	0	111	0
6:30	AM	0	9	1	2	0	0	0	0	0	0	42	16	0	45	2	0	117	0
6:45	AM	0	7	0	8	0	0	0	0	0	0	45	18	0	52	4	0	134	445
7:00	AM	0	5	1	10	0	0	0	0	0	0	45	15	0	53	2	0	131	493
7:15	AM	0	12	0	9	0	0	0	0	0	0	66	17	0	60	8	0	172	554
7:30	AM	0	13	2	6	0	0	0	0	0	0	105	20	0	83	8	0	237	674
7:45	AM	0	19	2	17	0	0	0	0	0	0	86	25	0	72	4	0	225	765
8:00	AM	0	22	1	32	0	0	0	0	0	0	87	17	0	81	13	0	253	887
8:15	AM	0	17	1	31	0	0	0	0	0	0	68	13	0	61	14	0	205	920
8:30	AM	0	17	1	39	0	0	0	0	0	0	49	12	0	67	10	0	195	878
8:45	AM	0	17	0	21	0	0	0	0	0	0	42	17	0	58	15	0	170	823
9:00	AM	0	10	2	18	0	0	0	0	0	0	51	6	0	43	19	0	149	719
9:15	AM	0	17	1	19	0	0	0	0	0	0	45	9	0	40	20	0	151	665
9:30	AM	0	23	0	23	0	0	0	0	0	0	46	7	0	57	11	0	167	637
9:45	AM	0	25	1	21	0	0	0	0	0	0	45	5	0	45	12	0	154	621
Count	Total	0	228	15	269	0	0	0	0	0	0	897	206	0	895	144	0	2,654	0
S1-	All	0	71	6	86	0	0	0	0	0	0	346	75	0	297	39	0	920	0
Peak Hour	HV	0	1	3	0	0	0	0	0	0	0	0	1	0	0	3	0	8	0
ioui	HV%	-	1%	50%	0%	-	-	-	-	-	-	0%	1%	-	0%	8%	-	1%	0

Note: Four-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

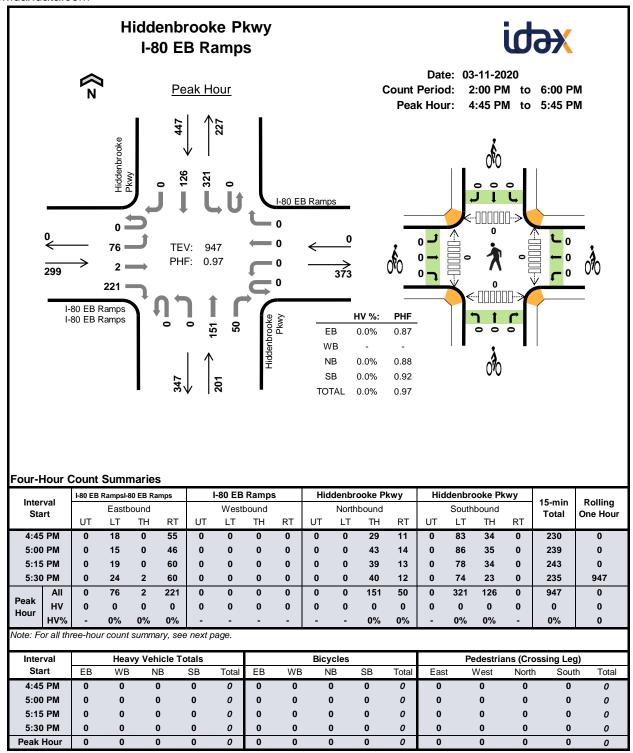
Interval		Heavy	Vehicle	Totals				Bicycles				Pedestria	ans (Cross	ing Leg)	
Start	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
6:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
7:00 AM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0
8:00 AM	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
9:15 AM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
9:30 AM	2	0	0	1	3	0	0	1	0	1	0	0	0	0	0
9:45 AM	0	0	3	2	5	0	0	1	0	1	0	0	0	0	0
Count Total	13	0	5	11	29	0	0	2	0	2	0	0	0	0	0
Peak Hour	4	0	1	3	8	0	0	0	0	0	0	0	0	0	0

la ta maal	I-80 EB	Rampsi-	80 EB Ra	mps		I-80 EB	Ramps	S	Hid	denbro	oke Pl	кwy	Hid	denbro	oke Pl	wy	45!	D - 111
Interval Start		Eastb	ound			Westl	bound			North	bound			South	bound		15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	. • • • •	0.10 1.10 4.1
6:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	5
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	6
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	3	5
8:00 AM	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	3	6
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	8
8:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	10
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
9:00 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	6
9:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	6
9:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	3	7
9:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	2	0	0	5	12
Count Total	0	1	7	5	0	0	0	0	0	0	3	2	0	7	4	0	29	0
Peak Hour	0	1	3	0	0	0	0	0	0	0	0	1	0	0	3	0	8	0

#### Four-Hour Count Summaries - Bikes

	I-80 EB Ra	mpsl-80 EB	Ramps	I-80	EB Ran	nps	Hidde	nbrooke	Pkwy	Hidde	nbrooke	Pkwy		- ···
Interval Start	Е	astboun	d	V	Vestboun	ıd	N	lorthbour	nd	S	outhbour	nd	15-min Total	Rolling One Hour
Otare	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	- Otal	One mou
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	1
9:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Count Total	0	0	0	0	0	0	0	2	0	0	0	0	2	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



		I-80 EB	Rampsl-	80 EB Ra	ımps		I-80 EB	Ramp	S	Hid	denbro	ooke Pl	кwy	Hie	ddenbro	oke Pk	wy	45	D - 111
Interv Star			Eastb	ound			Westl	bound			North	bound			South	ound		15-min Total	Rolling One Hour
Stai	٠	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One noui
2:00	PM	0	18	4	24	0	0	0	0	0	0	52	6	0	64	28	0	196	0
2:15	PM	0	16	2	33	0	0	0	0	0	0	38	11	0	56	15	0	171	0
2:30	PM	0	21	1	41	0	0	0	0	0	0	40	7	0	72	15	0	197	0
2:45	PM	0	23	1	32	0	0	0	0	0	0	43	9	0	64	21	0	193	757
3:00	PM	0	19	0	44	0	0	0	0	0	0	38	6	0	56	21	0	184	745
3:15	PM	0	23	0	61	0	0	0	0	0	0	34	10	0	63	25	0	216	790
3:30	PM	0	20	0	43	0	0	0	0	0	0	38	9	0	76	18	0	204	797
3:45	PM	0	27	1	51	0	0	0	0	0	0	40	10	0	88	25	0	242	846
4:00	PM	0	17	1	46	0	0	0	0	0	0	33	11	0	80	26	0	214	876
4:15	PM	0	16	1	43	0	0	0	0	0	0	31	7	0	69	23	0	190	850
4:30	PM	0	18	1	54	0	0	0	0	0	0	27	9	0	66	23	0	198	844
4:45	PM	0	18	0	55	0	0	0	0	0	0	29	11	0	83	34	0	230	832
5:00	PM	0	15	0	46	0	0	0	0	0	0	43	14	0	86	35	0	239	857
5:15	PM	0	19	0	60	0	0	0	0	0	0	39	13	0	78	34	0	243	910
5:30	PM	0	24	2	60	0	0	0	0	0	0	40	12	0	74	23	0	235	947
5:45	PM	0	21	1	52	0	0	0	0	0	0	29	10	0	78	32	0	223	940
Count T	otal	0	315	15	745	0	0	0	0	0	0	594	155	0	1,153	398	0	3,375	0
Peak	All	0	76	2	221	0	0	0	0	0	0	151	50	0	321	126	0	947	0
-eak -lour	HV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HV%	-	0%	0%	0%	-	-	-	-	-	-	0%	0%	-	0%	0%	-	0%	0

Note: Four-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

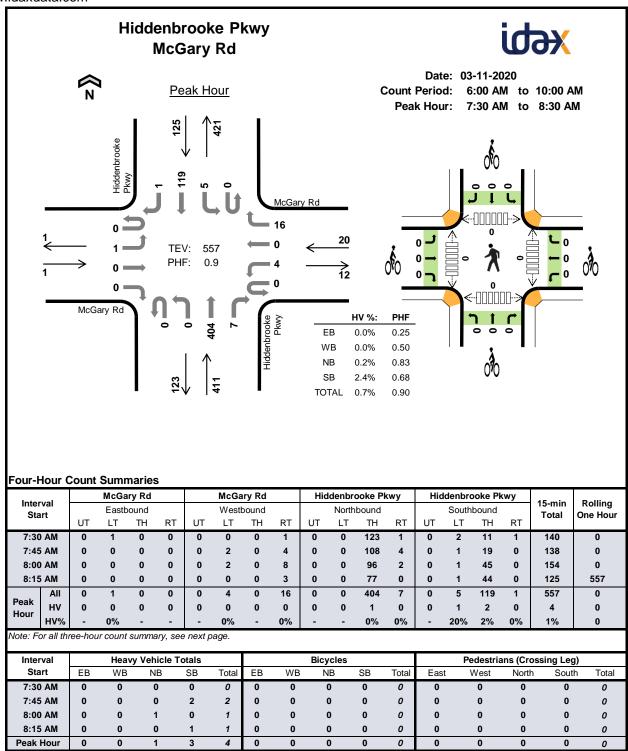
Interval		Heavy	Vehicle	Totals				Bicycles	i			Pedestria	ans (Cross	ing Leg)	
Start	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
2:00 PM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0
2:15 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0
2:30 PM	3	0	1	1	5	0	0	0	0	0	0	0	0	0	0
2:45 PM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	8	0	6	3	17	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

lutamed.	I-80 EB	Rampsl-	80 EB Ra	mps		I-80 EB	Ramp	S	Hid	denbro	oke Pl	кwy	Hid	ldenbro	oke Pl	сwy	45	D - III
Interval Start		Eastb	oound			Westl	bound			North	bound			South	bound		15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	. • • • •	0.10 1.10 4.1
2:00 PM	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0
2:15 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
2:30 PM	0	1	0	2	0	0	0	0	0	0	1	0	0	1	0	0	5	0
2:45 PM	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	13
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
3:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	4	2	2	0	0	0	0	0	0	5	1	0	3	0	0	17	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

#### Four-Hour Count Summaries - Bikes

	I-80 EB Rai	mpsl-80 EB	Ramps	I-80	EB Ran	nps	Hidde	nbrooke	Pkwy	Hidde	nbrooke	Pkwy	45 .	- III
Interval Start	Е	astboun	d	V	Vestboun	ıd	N	lorthbour	nd	S	outhbour	nd	15-min Total	Rolling One Hour
- Cian i	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	. • • • •	0.10 1.10 4.1
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



_	_		McGa	ry Rd			McGa	ry Rd		Hid	denbr	ooke Pk	wy	Hic	ldenbro	oke Pk	wy		
Inte			Eastb	ound			Westk	ound			North	bound	-		South	bound	-	15-min	Rolling One Hour
Sta	ırt	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One Hour
6:00	) AM	0	0	0	0	0	0	0	0	0	0	36	0	0	1	5	0	42	0
6:15	5 AM	0	0	0	0	0	0	0	1	0	0	47	0	0	0	9	0	57	0
6:30	) AM	0	0	0	0	0	1	0	1	0	0	57	0	1	0	3	0	63	0
6:45	5 AM	0	0	0	0	0	1	0	2	0	0	60	0	0	1	10	1	75	237
7:00	) AM	0	1	0	0	0	1	0	0	0	1	60	1	0	1	10	1	76	271
7:15	5 AM	0	2	0	0	0	3	0	0	0	0	81	1	0	0	17	0	104	318
7:30	MA (	0	1	0	0	0	0	0	1	0	0	123	1	0	2	11	1	140	395
7:45	5 AM	0	0	0	0	0	2	0	4	0	0	108	4	0	1	19	0	138	458
8:00	) AM	0	0	0	0	0	2	0	8	0	0	96	2	0	1	45	0	154	536
8:15	5 AM	0	0	0	0	0	0	0	3	0	0	77	0	0	1	44	0	125	557
8:30	) AM	0	0	0	0	0	2	0	5	0	0	57	1	0	3	46	0	114	531
8:45	5 AM	0	0	0	0	0	0	0	6	0	0	52	0	0	4	32	0	94	487
9:00	) AM	0	1	0	0	0	0	0	2	0	0	55	0	0	2	34	1	95	428
9:15	5 AM	0	0	0	0	0	0	0	3	0	0	49	1	1	2	36	0	92	395
9:30	) AM	0	1	0	0	0	3	0	1	0	0	51	0	0	1	32	1	90	371
9:45	5 AM	0	1	0	0	0	2	0	4	1	0	45	0	0	3	30	0	86	363
Count	Total	0	7	0	0	0	17	0	41	1	1	1,054	11	2	23	383	5	1,545	0
D1-	All	0	1	0	0	0	4	0	16	0	0	404	7	0	5	119	1	557	0
Peak Hour	HV	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	4	0
iioui	HV%	-	0%	-	-	-	0%	-	0%	-	-	0%	0%	-	20%	2%	0%	1%	0

Note: Four-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

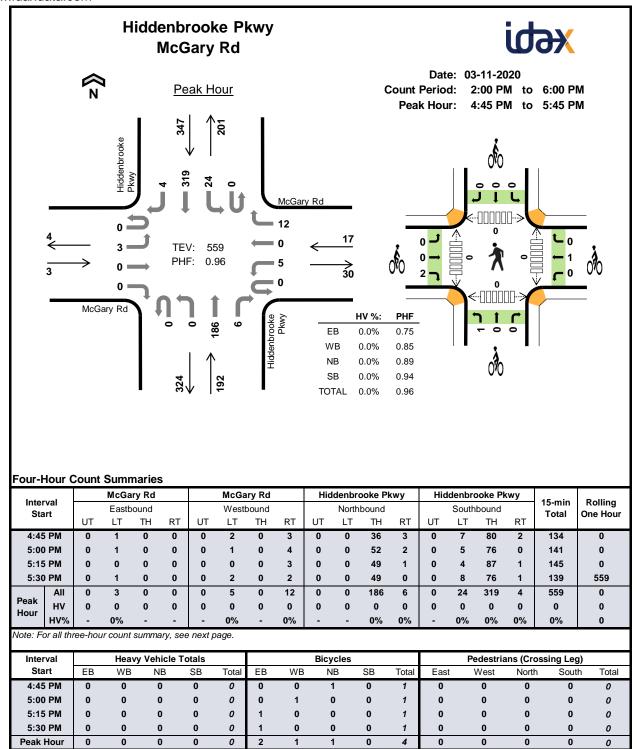
Interval		Heavy	Vehicle	Totals				Bicycles				Pedestria	ans (Cross	ing Leg)	
Start	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
6:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	1	1	0	0	0	0	0	0	1	1	0	2
9:30 AM	0	0	0	2	2	1	0	0	0	1	0	0	0	0	0
9:45 AM	0	0	3	0	3	1	1	0	0	2	0	0	0	0	0
Count Total	0	0	5	9	14	2	1	0	0	3	0	1	1	0	2
Peak Hour	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0

		McGa	ry Rd			McGa	ry Rd		Hid	denbro	oke Pl	wy	Hid	denbro	oke Pl	wy		
Interval Start		Eastb	ound			Westl	oound			North	bound			South	bound		15-min Total	Rolling One Hour
Otart	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	i Otai	One riou
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4
9:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	7
Count Total	0	0	0	0	0	0	0	0	0	0	5	0	0	1	8	0	14	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	4	0

#### Four-Hour Count Summaries - Bikes

	N	IcGary R	ld	N	IcGary R	ld	Hidde	nbrooke	Pkwy	Hidde	nbrooke	Pkwy		- ···
Interval Start	Е	astboun	d	V	Vestboun	ıd	N	lorthbour	nd	S	outhbour	nd	15-min Total	Rolling One Hour
- Clair	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		0.10 1.00.
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	1
9:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	2	3
Count Total	1	1	0	0	0	1	0	0	0	0	0	0	3	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



1			McGa	ry Rd			McGa	ry Rd		Hid	denbro	ooke Pl	кwy	Hic	ldenbr	ooke Pk	wy	15-min	D. III.
Inter Sta			Eastb	ound			West	ound			North	bound			South	bound		Total	Rolling One Hour
Sta		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	One noui
2:00	PM (	0	1	0	0	0	1	0	4	0	0	52	0	0	5	46	1	110	0
2:15	PM	0	0	0	0	0	1	0	3	0	0	48	1	0	2	46	0	101	0
2:30	PM	0	0	0	0	0	0	0	0	0	0	46	0	0	2	53	1	102	0
2:45	PM .	0	1	0	0	0	2	0	3	0	0	47	1	0	3	50	0	107	420
3:00	PM (	0	1	1	0	0	1	1	1	0	0	42	1	0	3	61	1	113	423
3:15	PM	0	0	0	0	0	0	0	2	0	0	42	1	1	4	81	0	131	453
3:30	PM	0	1	0	0	0	0	0	2	0	0	43	0	0	3	53	5	107	458
3:45	PM	0	2	0	1	0	1	0	3	0	0	44	1	0	4	71	1	128	479
4:00	PM	0	0	0	0	0	0	0	3	0	0	41	1	0	4	67	0	116	482
4:15	PM	0	0	0	1	0	0	0	3	0	0	35	1	0	4	62	1	107	458
4:30	PM	0	0	0	0	0	0	0	1	0	0	35	0	0	5	72	0	113	464
4:45	PM	0	1	0	0	0	2	0	3	0	0	36	3	0	7	80	2	134	470
5:00	PM	0	1	0	0	0	1	0	4	0	0	52	2	0	5	76	0	141	495
5:15	PM	0	0	0	0	0	0	0	3	0	0	49	1	0	4	87	1	145	533
5:30	PM	0	1	0	0	0	2	0	2	0	0	49	0	0	8	76	1	139	559
5:45	5 PM	0	1	0	0	0	2	0	5	0	0	33	0	0	3	81	0	125	550
Count	Total	0	10	1	2	0	13	1	42	0	0	694	13	1	66	1,062	14	1,919	0
Peak	All	0	3	0	0	0	5	0	12	0	0	186	6	0	24	319	4	559	0
-eak -lour	HV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HV%	-	0%	-	-	-	0%	-	0%	-	-	0%	0%	-	0%	0%	0%	0%	0

Note: Four-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

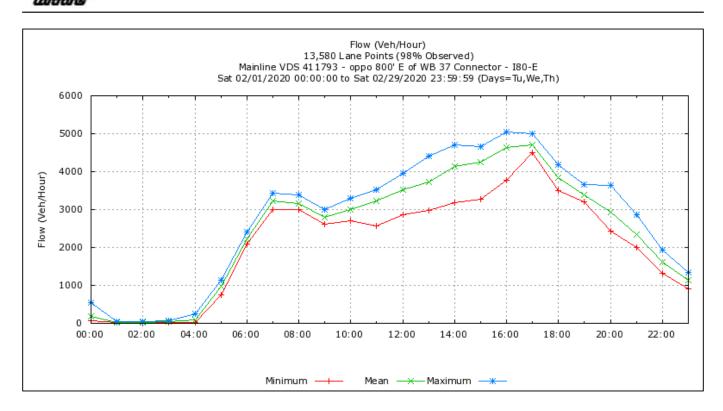
Interval		Heavy	Vehicle	Totals				Bicycles				Pedestria	ans (Cross	ing Leg)	
Start	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
2:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
3:45 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	8	2	10	3	1	2	0	6	0	0	0	0	0
Peak Hour	0	0	0	0	0	2	1	1	0	4	0	0	0	0	0

		McGa	ry Rd			McGa	ry Rd		Hid	denbro	oke Pl	сwy	Hid	ldenbro	oke Pl	кwy		<b>.</b>
Interval Start	Eastbound			Westbound			Northbound				Southbound				15-min Total	Rolling One Hour		
Otart	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	Total	Cito tioui
2:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	9
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	7	1	0	0	2	0	10	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

#### Four-Hour Count Summaries - Bikes

	N	IcGary R	ld	N	IcGary R	ld	Hidde	nbrooke	Pkwy	Hidde	nbrooke	Pkwy	45 .	5
Interval Start	Е	astboun	d	V	Vestboun	ıd	N	lorthbour	nd	S	outhbour	nd	15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	. • • • •	0.10 1.10
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	1
3:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	1
5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	2
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	3
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	3	0	1	0	2	0	0	0	0	0	6	0
Peak Hour	0	0	2	0	1	0	1	0	0	0	0	0	4	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



Time	Minimum	Mean	Maximum	# Lane Points	% Observed
00:00	57.00	183.58	544.00	576	100.0
01:00	12.00	27.83	47.00	576	100.0
02:00	0.00	23.75	43.00	576	100.0
03:00	17.00	37.17	60.00	576	100.0
04:00	23.00	97.00	259.00	576	100.0
05:00	742.00	976.00	1,146.00	576	100.0
06:00	2,088.00	2,221.25	2,404.00	576	98.6
07:00	2,995.00	3,225.00	3,425.00	576	97.2
08:00	3,004.00	3,166.17	3,376.00	576	100.0
09:00	2,616.00	2,788.92	3,000.00	576	100.0
10:00	2,705.00	2,992.83	3,297.00	576	96.5
11:00	2,567.00	3,228.33	3,529.00	576	91.7
12:00	2,863.00	3,520.75	3,945.00	576	91.7
13:00	2,976.00	3,735.33	4,408.00	576	98.6
14:00	3,188.00	4,139.17	4,702.00	576	100.0
15:00	3,280.00	4,247.58	4,659.00	576	100.0
16:00	3,776.00	4,633.42	5,040.00	576	100.0
17:00	4,497.00	4,704.50	5,001.00	572	100.0
18:00	3,500.00	3,831.08	4,187.00	576	100.0
19:00	3,209.00	3,394.08	3,666.00	576	100.0
20:00	2,424.00	2,931.33	3,637.00	576	97.9
21:00	2,002.00	2,333.83	2,853.00	576	92.4
22:00	1,329.00	1,616.58	1,922.00	576	93.8
23:00	920.00	1,137.92	1,334.00	576	100.0

2/3

### **PeMS Report Description**

Report Aggregates>Time of Day

Report link <a href="http://pems.dot.ca.gov/?report\_f">http://pems.dot.ca.gov/?report\_f</a>

orm=1&dnode=VDS&content=l oops&tab=det\_tod&station\_id= 411793&s\_time\_id=158051520 0&s\_time\_id\_f=02%2F01%2F2 020&e\_time\_id=1583020740&e \_\_time\_id\_f=02%2F29%2F2020 &dow\_2=on&dow\_3=on&dow\_ 4=on&q=flow&fn=1&pct1=25&p

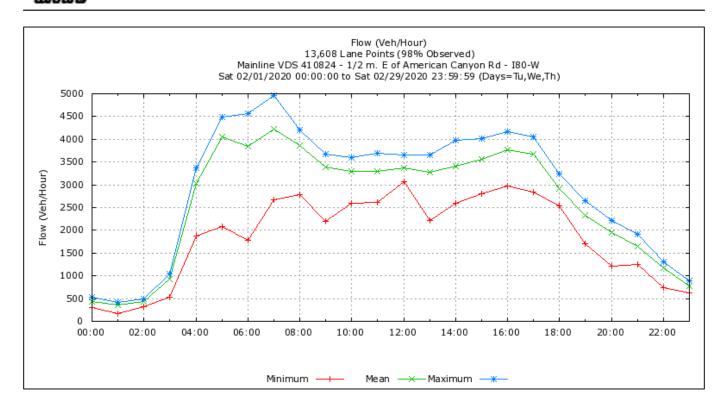
ct2=75

Report generated 06/30/2020 14:40 PeMS version caltrans\_pems-19.0.0

## **Report Parameters**

Parameter	Value
Quantity	Flow
Data	13,820 Lane Points
Data Quality	98.3% Observed
Segment Type	VDS
Segment Name	Mainline VDS 411793 - oppo
	800' E of WB 37 Connector
start date	02/01/2020 00:00:00
end date	02/29/2020 23:59:59

3/3



1/3

Time	Minimum	Mean	Maximum	# Lane Points	% Observed
00:00	301.00	438.92	534.00	576	100.0
01:00	165.00	364.42	419.00	576	100.0
02:00	325.00	442.67	496.00	576	100.0
03:00	531.00	931.25	1,038.00	576	100.0
04:00	1,877.00	3,033.83	3,376.00	576	100.0
05:00	2,092.00	4,048.00	4,492.00	576	100.0
06:00	1,772.00	3,839.50	4,572.00	576	97.9
07:00	2,661.00	4,217.00	4,968.00	576	97.2
08:00	2,781.00	3,871.17	4,200.00	576	100.0
09:00	2,199.00	3,380.92	3,666.00	576	99.3
10:00	2,589.00	3,302.67	3,597.00	576	100.0
11:00	2,607.00	3,302.67	3,684.00	576	94.4
12:00	3,059.00	3,375.00	3,656.00	576	91.7
13:00	2,207.00	3,276.25	3,662.00	576	98.6
14:00	2,600.00	3,410.92	3,984.00	576	100.0
15:00	2,808.00	3,566.58	4,012.00	576	100.0
16:00	2,966.00	3,769.50	4,168.00	576	100.0
17:00	2,845.00	3,674.83	4,055.00	572	100.0
18:00	2,536.00	2,917.42	3,240.00	576	100.0
19:00	1,702.00	2,327.33	2,658.00	576	100.0
20:00	1,219.00	1,960.08	2,224.00	576	97.9
21:00	1,251.00	1,655.00	1,913.00	576	92.4
22:00	730.00	1,170.42	1,314.00	576	93.8
23:00	618.00	771.42	891.00	576	100.0

2/3

## **PeMS Report Description**

Report Aggregates>Time of Day

Report link <a href="http://pems.dot.ca.gov/?report\_f">http://pems.dot.ca.gov/?report\_f</a>

orm=1&dnode=VDS&content=l oops&tab=det\_tod&station\_id= 410824&s\_time\_id=158051520 0&s\_time\_id\_f=02%2F01%2F2 020&e\_time\_id=1583020740&e \_\_time\_id\_f=02%2F29%2F2020 &dow\_2=on&dow\_3=on&dow\_ 4=on&q=flow&fn=1&pct1=25&p

ct2=75

Report generated 06/30/2020 14:41 PeMS version caltrans\_pems-19.0.0

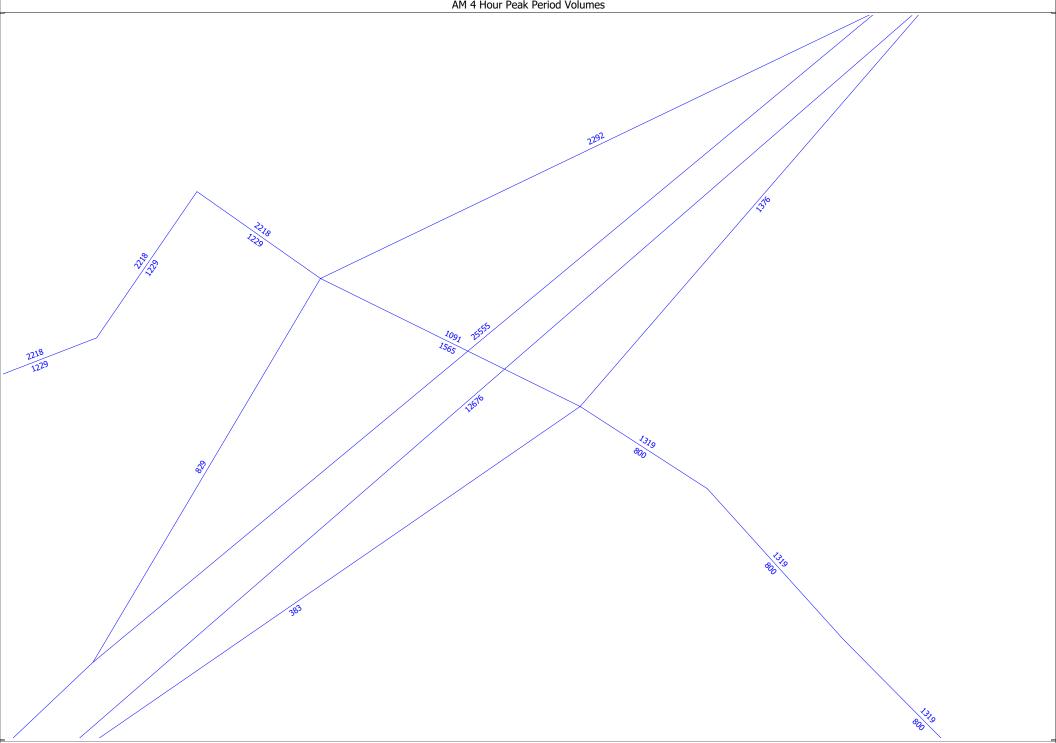
# **Report Parameters**

Parameter	Value
Quantity	Flow
Data	13,820 Lane Points
Data Quality	98.5% Observed
Segment Type	VDS
Segment Name	Mainline VDS 410824 - 1/2 m.
	E of American Canyon Rd
start date	02/01/2020 00:00:00
end date	02/29/2020 23:59:59

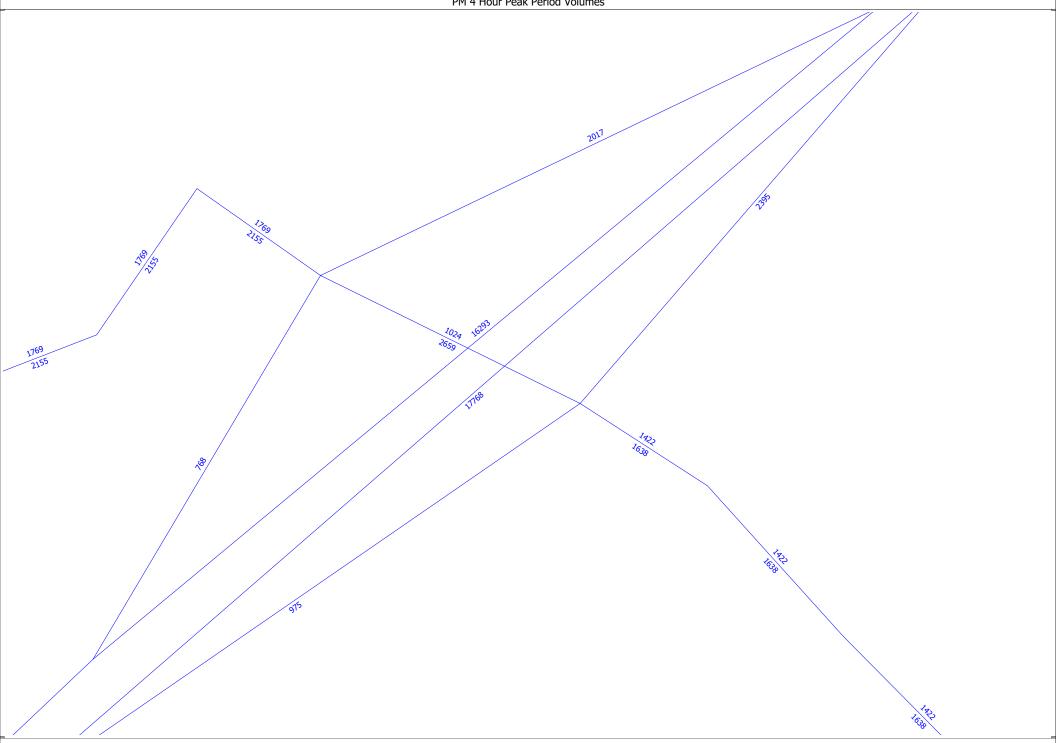
3/3

# **Appendix C:** Model Outputs

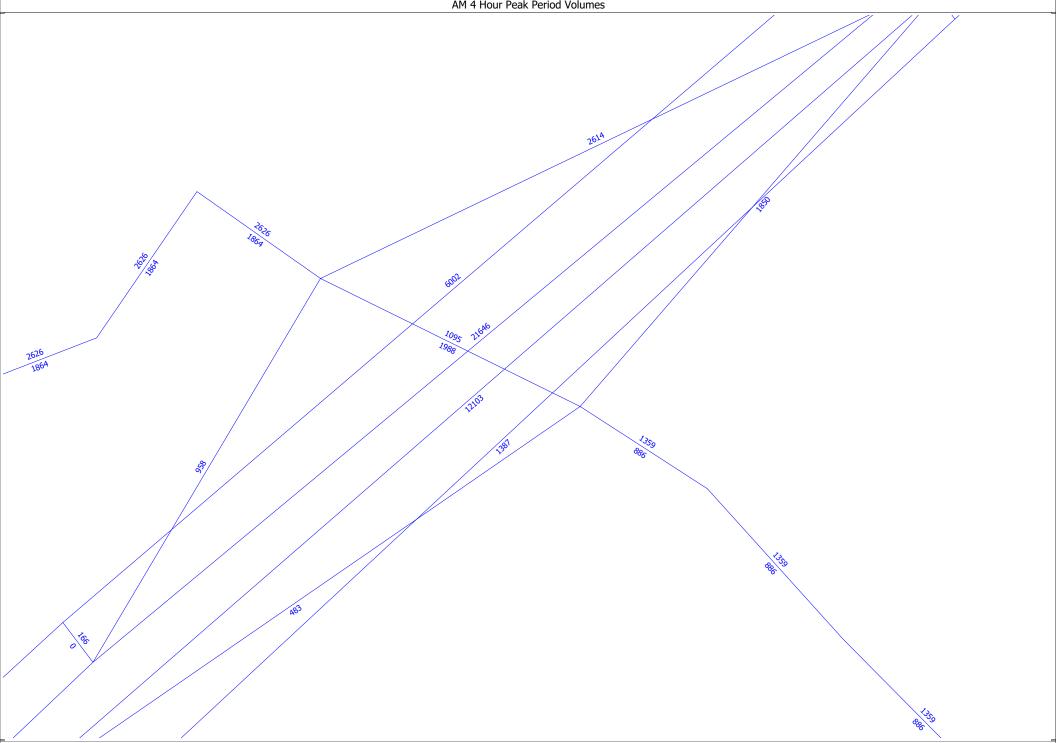
SNABM Model 2018/09/19 Version from CS (Pre-County Split) Scenario Year 2015 AM 4 Hour Peak Period Volumes



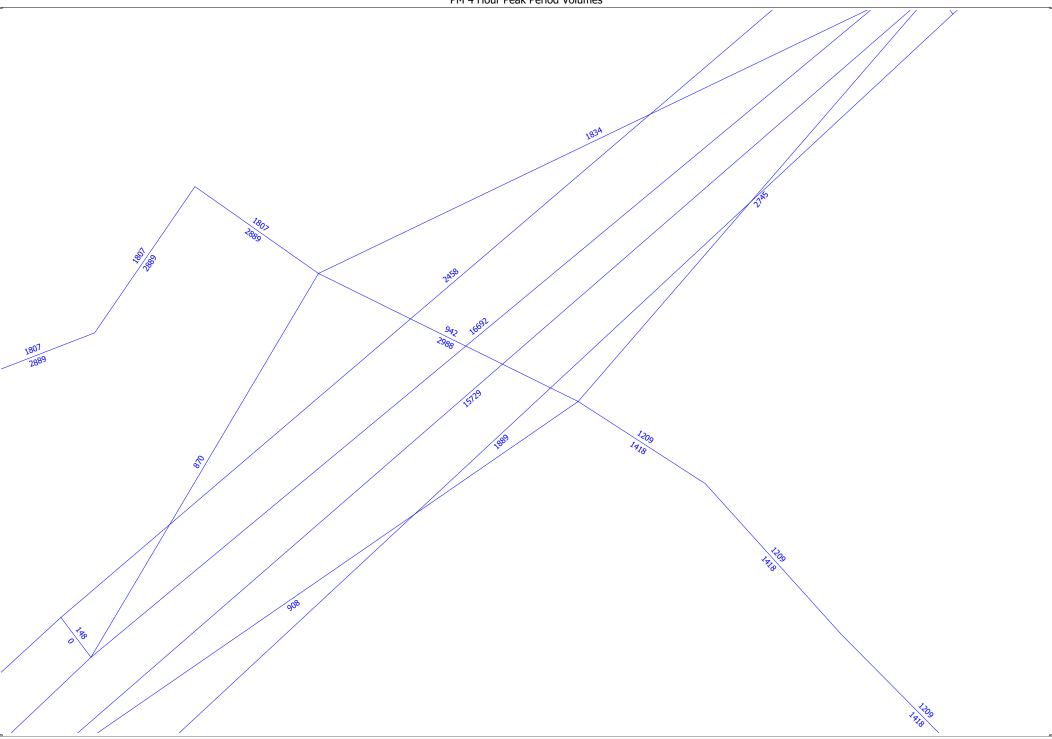
SNABM Model 2018/09/19 Version from CS (Pre-County Split) Scenario Year 2015 PM 4 Hour Peak Period Volumes



SNABM Model 2018/09/19 Version from CS (Pre-County Split) Scenario Year 2040 AM 4 Hour Peak Period Volumes



SNABM Model 2018/09/19 Version from CS (Pre-County Split) Scenario Year 2040 PM 4 Hour Peak Period Volumes



Appendix D: Hiddenbrooke Trip Generation

				Trip Ger	neration of R	emaining Hid	denbrooke	Land Uses					
Land Use	Am	ount	ITE		Trip Rates		Daily Trips	AN	l Pk Hour Tr	ips	PN	l Pk Hour Tr	ips
Land Ose	Units	Quantity	Code	Daily	AM	PM	Daily 111ps	ln	Out	Total	ln	Out	Total
ITE (Single-family Residential)	du <sup>1</sup>	108	210	9.44	0.74	0.99	1,020	20	60	80	67	40	107

Notes: Trip Generation, 10th Edition (Institute of Transportation Engineers) was used to develop trip generation rates.

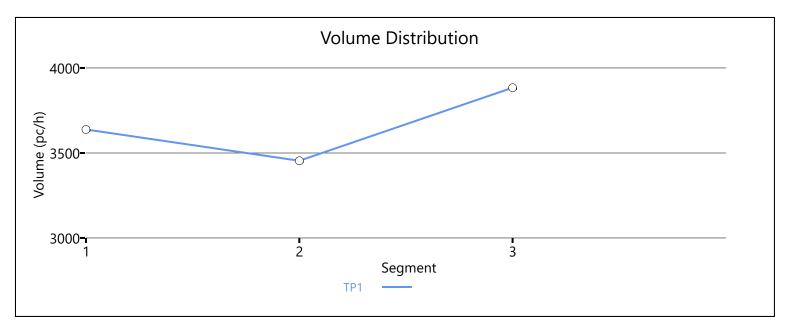
1. du = dwelling unit

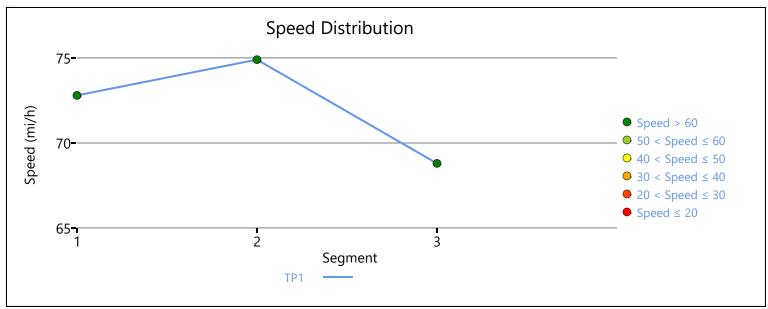
Source: Fehr & Peers, 2020

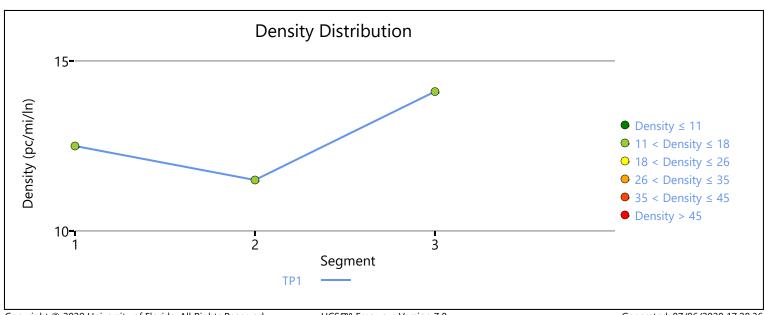
Appendix E: SimTraffic and HCS
Outputs

					НС	S7 F	reeway l	Facilitie	es Re	eport						
Projec	t Info	rmat	ion													
Analyst					Fehr & Pee	ers		Date					6/30/2	020		
Agency					Caltrans &	City of	Vallejo	Analysis Year					2020			
Jurisdicti	ion				Caltrans			Time Peri	od Anal	lyzed			AM Pe	ak H	our	
Project D	Descripti	on			I-80 Hidde	nbrooke	e TOAR	Unit					United	Stat	es Custom	ary
Facilit	y Glok	oal In	put													
Jam Den	sity, pc/	mi/ln			190.0			Density a	t Capac	ity, pc/r	ni/ln		45.0			
Queue D	oischarge	Capac	ity Dro	о, %	7			Total Seg	ments				3			
Total Tim	ne Period	ds			1			Time Peri	od Dura	ation, m	in		15			
Facility L	ength, n	ni			0.99											
Facilit	y Segi	ment	Data													
No.		Coded			Analyzed			Name			L	.ength,	, ft		Lane	es
1	I	Diverge			Diverge	1	rican Cany Ramp	on Road	d Off-		1500			4		
2	Basic Basic I-80 EB						-80 EB - Ame to	rican Cany On-Ramp		d Off-		2220			4	
3		Merge			Merge	ı	I-80 EB - American Canyon Road On- Ramp					1500 4				
Facilit	y Segi	ment	Data				Segment	1: Dive	ae.							
Time	PI	4F	fŀ	łV	Flow		Capa			/c	Spe	eed		Den	sitv	LOS
Period	<u> </u>				(pc/	/h)	(рс		Ratio			(mi/h)			ni/ln)	
	F	R	F	R	Freeway	Ramp	-	Ramp	F	R	F	R	Freev		Ramp	
1	0.94	0.74	0.943	0.971	3638	227	9600	2100	0.38	0.11	72.8	64.5	12.	5	17.4	В
	T		-		T	_	Segmen			_			T			
Time Period	Pł	4F	fŀ	łV	Flow (pc)			pacity d/c pc/h) Ratio			Speed (mi/h)		Dens (pc/m			LOS
1	0.9	94	0.9	943	345	54	96			36	74	1.9		11	.5	В
			1				Segment	3: Mer	ge							
Time Period	Pi	4F	fŀ	łV	Flow (pc)		Capa (po			/c tio		eed i/h)		Den pc/m	sity ni/ln)	LOS
	F	R	F	R	Freeway	Ramp	_	Ramp	F	R	F	R	Freev	way	Ramp	
1	0.94	0.91	0.943	0.971	3884	430	9600	2100	0.40	0.20	68.8	64.4	14.	1	17.8	В
Facilit	y Tim	e Peri	iod R	esult	S											
Т	Sp	eed, m	ni/h		Density, po	c/mi/ln	Dens	ity, veh/m	i/ln	Tra	vel Tin	ne, mir	1		LOS	
1		72.3			12.5			11.8			0.80	0			В	
Facilit	y Ove	rall R	esults	5												
Space M	ean Spe	ed, mi/	h		72.3			Density, v	eh/mi/l	ln			11.8			
Λ	Travel T	ime, mi	n		0.80			Density, p	c/mi/lr	1			12.5			

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution
when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

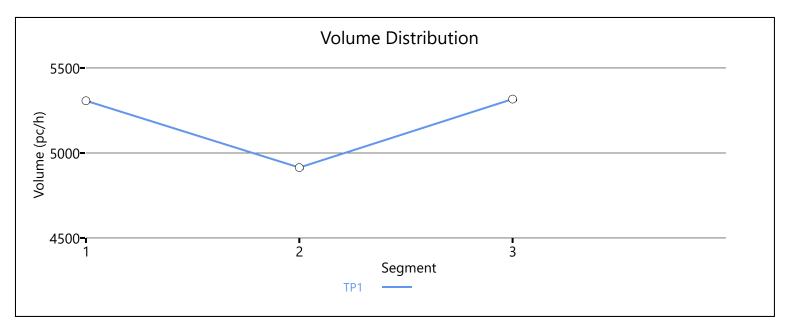


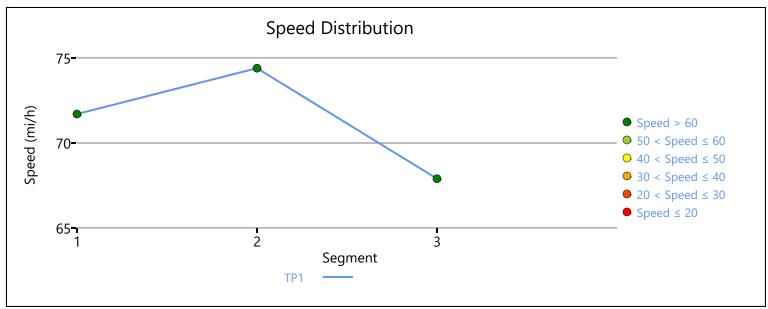


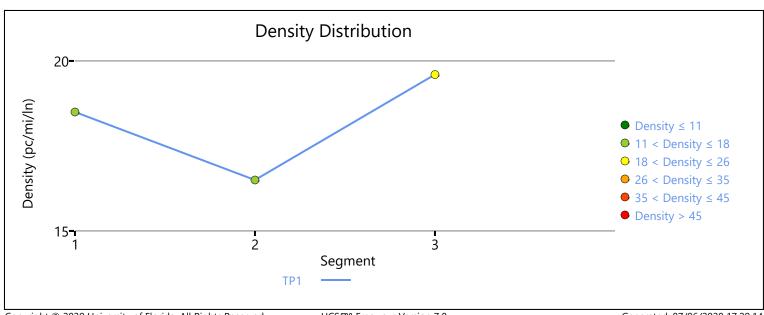


					НС	.S7 F	reeway l	Facilitie	es Re	eport						
Projec	t Info	rmat	ion			_			_	_	_	_	_			
Analyst					Fehr & Pee	rs		Date					6/30/2	2020		
Agency					Caltrans &	City of '	Vallejo	Analysis Y	⁄ear				2020			
Jurisdicti	ion				Caltrans			Time Peri	od Anal	lyzed			PM Pe	ak H	our	
Project D	Descripti	on			I-80 Hidde	nbrooke	e TOAR	Unit					United	l Stat	es Custom	ary
Facilit	y Gloł	oal In	put													
Jam Den	sity, pc/	mi/ln			190.0			Density a	t Capac	ity, pc/r	mi/ln		45.0			
Queue D	Discharge	e Capac	ity Dro	o, %	7			Total Seg	ments				3			
Total Tim	ne Period	ds			1			Time Peri	od Dura	ation, m	in		15			
Facility L	ength, n	ni			0.99											
Facilit	y Segi	ment	Data													
No.		Coded			Analyzed			Name			L	ength,	, ft		Lane	es
1	I	Diverge	!		Diverge	Į.	-80 EB - Ame	rican Cany Ramp	on Road	d Off-		1500			4	
2	Basic Basic I-80 EB - A						-80 EB - Ame to	rican Cany On-Ramp		d Off-		2220			4	
3		Merge			Merge	I	I-80 EB - American Canyon Road On- Ramp					1500 4				
Facilit	y Segi	ment	Data			·										
							Segment	1: Dive	ge							
Time Period	Pi	4F	fŀ	IV	Flow (pc/						Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freev	way	Ramp	
1	0.94	0.87	0.943	0.971	5307	412	9600	2100	0.55	0.20	71.7	63.9	18.	.5	24.6	С
							Segmen	t 2: Bas	ic							
Time Period	Pi	4F	fŀ	IV	Flow (pc/		Capa (pc			/c itio		eed i/h)		Den pc/m	sity ni/ln)	LOS
1	0.9	94	0.9	943	49	14	96	00	0.	51	74	1.4		16	.5	В
							Segment	3: Mer	ge							
Time Period	Pi	-IF	fŀ	IV	Flow (pc/		Capa (pc			/c itio		eed i/h)	(	Den pc/m	sity ni/ln)	LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freev	way	Ramp	
1	0.94	0.97	0.943	0.971	5317	403	9600	2100	0.55	0.19	67.9	63.8	19.	.6	22.1	С
Facilit	y Tim	e Peri	iod R	esult												
Т	Sp	eed, m	ni/h		Density, po	:/mi/ln	Densi	ity, veh/m	i/ln	Tra	evel Tin	ne, mir	1		LOS	
1		71.6			18.0			17.0			0.80	0			С	
Facilit	y Ove	rall R	esults	5												
Space M	ean Spe	ed, mi/	h		71.6			Density, w	eh/mi/l	n			17.0			
Average	Travel T	ime, mi	n		0.80			Density, p	c/mi/lr	)			18.0			

Messages	
WARNING 1	Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
WARNING 2	Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
Comments	

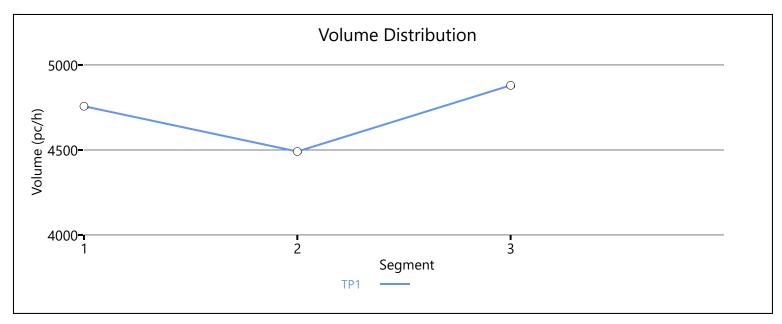


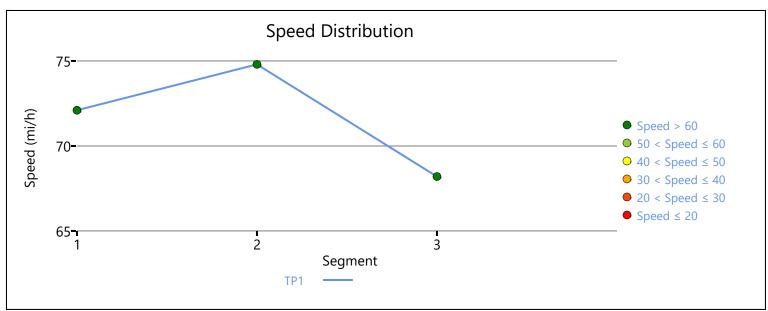


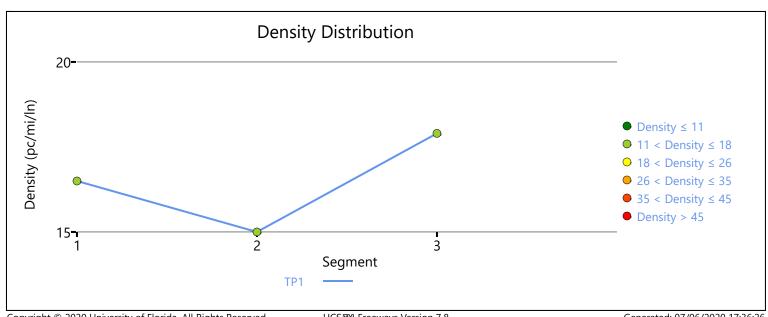


					НС	CS7 Fr	eeway l	Facilitie	es Re	eport						
Projec	t Info	rmat	ion													
Analyst					Fehr & Pee	ers		Date					6/30/2020	)		
Agency					Caltrans &	City of V	/allejo	Analysis Year					2020			
Jurisdicti	ion				Caltrans			Time Peri	od Anal	lyzed			AM Peak	Hour		
Project D	Descripti	on			I-80 Hidde	nbrooke	TOAR	Unit					United Sta	ates Custom	ary	
Facilit	y Glok	oal In	put													
Jam Den	sity, pc/	mi/ln			190.0			Density a	t Capac	ity, pc/r	ni/ln		45.0			
Queue D	Discharge	e Capac	ity Dro	р, %	7			Total Seg	ments				3			
Total Tim	ne Period	ds			1			Time Peri	od Dura	ation, m	in		15			
Facility L	ength, n	ni			0.93											
Facilit	y Segi	ment	Data													
No.		Coded			Analyzed			Name			L	ength,	ft	Lane	es	
1	[	Diverge			Diverge	I-8	80 WB - Ame	erican Cany Ramp	on Roa	d Off-		1500		4		
2		Basic			Basic	I-8	I-80 WB - American Canyon Road Off- to On-Ramp					1900		4		
3		Merge			Merge	I-8	I-80 WB - American Canyon Road On- Ramp					1500 4				
Facility	y Segi	ment	Data													
Time	DL					S	Segment	1: Dive	ge							
Period	"	4F	fl	IV	Flow (pc	Rate	Capa		d	/c ntio		eed i/h)		nsity mi/ln)	LOS	
reriod	F	-IF R	fl- F	IV R	1	Rate	Capa (pc	acity	d	-				mi/ľn)	LOS	
Period 1	<u> </u>			R	(pc,	Rate /h)	Capa (pc	acity /h)	d Ra	itio	(mi	i/h)	(pc/	mi/ľn)	<b>LOS</b>	
	F	R	F	R	(pc,	Rate /h) Ramp	Capa (pc	Ramp	d Ra F 0.50	rtio R	(mi	i/h) R	(pc/ Freeway	Ramp		
	F	<b>R</b> 0.69	<b>F</b> 0.943	R	(pc,	Rate /h) Ramp 352	Capa (pc) Freeway 9600 Segmen Capa	Ramp	d Ra F 0.50	rtio R	(mi	i/h) R	(pc/ Freeway 16.5	Ramp	С	
1 Time	<b>F</b> 0.94	R 0.69	F 0.943	<b>R</b> 0.971	(pc, Freeway 4757	Rate /h) Ramp 352 Rate /h)	Freeway 9600  Segmen Capa	Ramp 2100 t 2: Bas	d Ra F 0.50	R 0.17	F 72.1 Spe	(h) R 64.1	(pc/ Freeway 16.5	Ramp 22.4 nsity	С	
1 Time Period	F 0.94	R 0.69	F 0.943	R 0.971	(pc, Freeway 4757	Rate /h) 352  Rate /h) 391	Freeway 9600  Segmen Capa	Ramp 2100 t 2: Basecity /h) 00	d Ra  F 0.50  ic d Ra  0.00	R 0.17	F 72.1 Spe	R 64.1 eed i/h)	(pc/ Freeway 16.5	Ramp 22.4 nsity mi/ln)	C	
1 Time Period	F 0.94	R 0.69	F 0.943	R 0.971	(pc, Freeway 4757	Rate /h) Ramp 352 Rate /h)	Capa (pc)  Freeway  9600  Segment  Capa (pc)  96  Segment  Capa (pc)	Ramp 2100 t 2: Basecity /h) 00	d Ra  F  0.50  ic  d Ra  0.	R 0.17	(mi F 72.1	R 64.1 eed i/h)	(pc/ Freeway 16.5 De (pc/	Ramp 22.4 nsity mi/ln)	C LOS	
1 Time Period 1	PH 0.94	R 0.69	F 0.943	R 0.971	Flow (pc)	Rate /h) Ramp 352 Rate /h)	Capa (pc) Freeway 9600 Segmen Capa (pc) 96 Segment Capa (pc)	Ramp 2100 t 2: Basecity /h) 00 3: Mercacity	d Ra  F  0.50  ic  d Ra  0.	R 0.17	(mi F 72.1	eed i/h) 4.8	(pc/ Freeway 16.5 De (pc/	Ramp 22.4  nsity mi/ln) 5.0  nsity mi/ln)	C LOS	
1 Time Period 1	PH 0.94	R 0.69	F 0.943	R 0.971	Flow (pc)	Rate /h) Ramp 352 Rate /h)	Capa (pc) Freeway 9600 Segmen Capa (pc) 96 Segment Capa (pc)	Ramp 2100 t 2: Base acity /h) 00 3: Mere	d Ra  F 0.50  ic  d Ra  0.	R 0.17	Spo (mi	R 64.1 eed i/h)	(pc/ Freeway 16.5 De (pc/	Ramp 22.4  nsity mi/ln) 5.0  nsity mi/ln)	C	
Time Period  Time Period	PH 0.94	R 0.69	F 0.943  ft 0.943	R 0.971	Flow (pc) Freeway  4757  Flow (pc)  Flow (pc)  449	Rate /h) Ramp 352 Rate /h) 91	Capa (pc) Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa (pc)  Freeway	Ramp 2100 t 2: Base acity /h) 00 3: Mereority /h) Ramp	d Ra F 0.50 ic dRa 0.	R 0.17	Spo (mi	R 64.1 eed i/h) 1.8 eed i/h) R	(pc/ Freeway  16.5  De (pc/  1  De (pc/	Ramp 22.4  nsity mi/ln) 5.0  Ramp Ramp Ramp	LOS B	
Time Period  Time Period	PH 0.94  PH 0.94  PH 0.94  PH 0.94	R 0.69	F 0.943  ft 0.943  ft F 0.943	R 0.971	Flow (pc) Freeway  4757  Flow (pc)  Flow (pc)  449	Rate /h) Ramp 352 Rate /h) 91 Rate /h) Ramp 389	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Base acity /h) 00 3: Mereority /h) Ramp	d Ra F 0.50 ic d Ra 0. ge d Ra F 0.51	R   0.17   //c     //c     R     0.19	Spo (mi	eed i/h) 1.8  R 64.1  R 64.1  R 64.2	(pc/ Freeway 16.5 De (pc/ 17.9	Ramp 22.4  nsity mi/ln) 5.0  Ramp Ramp Ramp	LOS B	
Time Period  Time Period	PH 0.94  PH 0.94  PH 0.94  PH 0.94	R 0.69  HF 94  HF 0.96	F 0.943  ft 0.943  ft F 0.943	R 0.971	Flow (pc) Freeway  4757  Flow (pc)  449  Freeway  4880	Rate /h)  Ramp 352  Rate /h)  91  Rate /h)  Ramp 389	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Basecity /h) 00 3: Merconcity /h) Ramp 2100	d Ra F 0.50 ic d Ra 0. ge d Ra F 0.51	R   0.17   //c     //c     R     0.19	(mi   F   72.1   Spe   (mi   74   F   68.2	R 64.1 eed i/h) 1.8 R 64.2	(pc/ Freeway 16.5 De (pc/ 17.9	nsity mi/ln) 5.0  Ramp 22.4  nsity mi/ln) 5.0  Ramp 20.4	LOS B	
Time Period  Time Period  Trime Period	F 0.94  PH 0.94  F 0.94  Y Time  Sp	R 0.69  HF 94  HF 0.96  e Periodeed, m 71.8	F 0.943  ft 0.943  ft F 0.943	R 0.971	Flow (pc, 449) Freeway Flow (pc, 449) Flow (pc, 4880 Flow (pc, 588) Freeway Freeway	Rate /h)  Ramp 352  Rate /h)  91  Rate /h)  Ramp 389	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Base acity /h) 00 3: Mergacity /h) Ramp 2100	d Ra F 0.50 ic d Ra 0. ge d Ra F 0.51	R   0.17   //c     //c     R     0.19	Spo (mi 72 Spo (mi F 68.2	R 64.1 eed i/h) 1.8 R 64.2	(pc/ Freeway 16.5 De (pc/ 17.9	Ramp 22.4  nsity mi/ln) 5.0  Ramp 20.4  LOS	LOS B	
Time Period  Time Period  Time Period	F   0.94   PH   F   0.94   y Time   Sp	R 0.69  HF 94  HF 0.96  e Perioeed, m 71.8	fl fl f f o.943	R 0.971	Flow (pc, 449) Freeway Flow (pc, 449) Flow (pc, 4880 Flow (pc, 588) Freeway Freeway	Rate /h)  Ramp 352  Rate /h)  91  Rate /h)  Ramp 389	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Base acity /h) 00 3: Mergacity /h) Ramp 2100	d Ra F 0.50 ic d Ra 0. ge d Ra F 0.51	R 0.17 //c ottio 47 //c rtio R 0.19	Spo (mi 72 Spo (mi F 68.2	R 64.1 eed i/h) 1.8 R 64.2	(pc/ Freeway 16.5 De (pc/ 17.9	Ramp 22.4  nsity mi/ln) 5.0  Ramp 20.4  LOS	LOS B	

Messages	
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Comments	

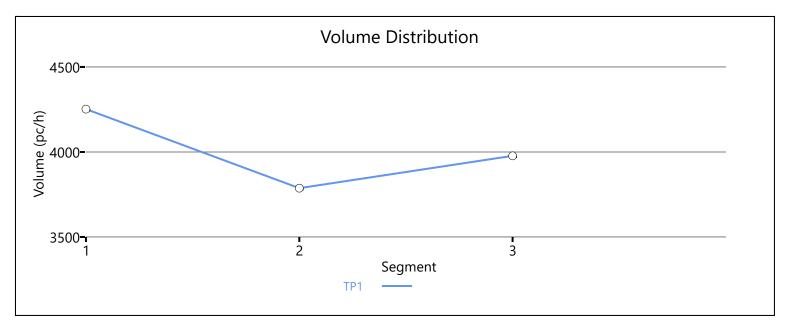


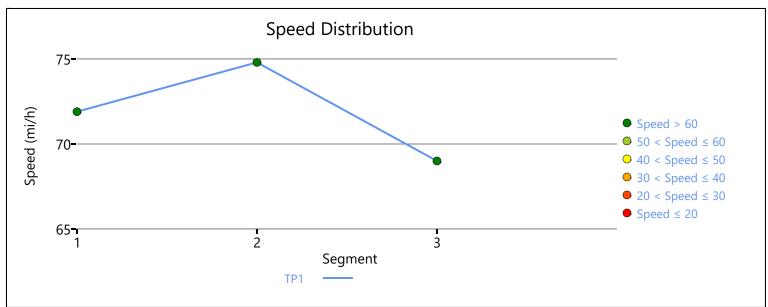


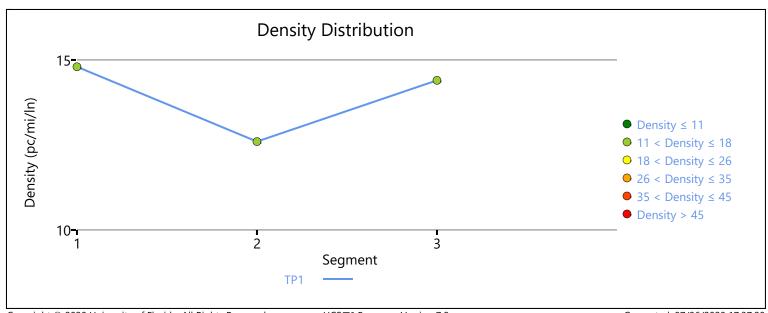


					НС	CS7 Fi	reeway l	Facilitie	es Re	eport					
Projec	t Info	rmat	ion	_											
Analyst					Fehr & Pee	ers		Date					6/30/2020	)	
Agency					Caltrans &	City of \	/allejo	Analysis Year					2020		
Jurisdicti	ion				Caltrans			Time Peri	od Anal	lyzed			AM Peak	Hour	
Project D	Descripti	on			I-80 Hidde	nbrooke	TOAR	Unit					United Sta	ates Custom	ary
Facilit	y Glok	oal In	put												
Jam Den	sity, pc/	mi/ln			190.0			Density a	t Capac	ity, pc/r	ni/ln		45.0		
Queue D	Discharge	e Capac	ity Dro	р, %	7			Total Seg	ments				3		
Total Tim	ne Period	ds			1			Time Peri	od Dura	ation, m	in		15		
Facility L	ength, n	ni			0.93										
Facilit	y Segi	ment	Data												
No.		Coded			Analyzed			Name			L	ength,	ft	Lane	es
1	[	Diverge	•		Diverge	I-	80 WB - Ame	erican Cany Ramp	on Roa	d Off-		1500		4	
2		Basic			Basic	I-	I-80 WB - American Canyon Road Off- to On-Ramp					1900		4	
3		Merge			Merge	I-	I-80 WB - American Canyon Road On- Ramp					1500 4			
Facility	y Segi	ment	Data												
Time	_					9	Segment	1: Dive	ge						
Period	Pi	4F	fl	łV	Flow (pc	Rate	Сара	1: Diver	d	/c itio		eed i/h)		nsity mi/ln)	LOS
_	F	HF R	fl-	IV R		Rate	Capa (pc	acity	d	-				mi/ľn)	LOS
				R	(pc,	Rate /h)	Capa (pc	acity (/h)	d Ra	itio	(mi	i/h)	(pc/	mi/ľn)	<b>LOS</b>
Period	F	R	F	R	(pc)	Rate /h) Ramp	Capa (po	Ramp	d Ra F	rtio R	(mi	i/h) R	(pc/ Freeway	Ramp	
Period	F	<b>R</b> 0.97	<b>F</b> 0.943	R	(pc)	Rate /h) Ramp 437	Capa (pc) Freeway 9600  Segmen Capa	Ramp	d Ra F 0.44	rtio R	(mi	i/h) R	(pc/ Freeway 14.8	Ramp	
Period  1  Time	<b>F</b> 0.94	R 0.97	F 0.943	<b>R</b> 0.971	(pc, Freeway 4252	Rate /h) Ramp 437 Rate /h)	Freeway 9600  Segmen  Capa	Ramp 2100 t 2: Bas	d Ra F 0.44	R 0.21	F 71.9 Spe	(i/h) R 63.9	(pc/ Freeway 14.8	Ramp 20.9	С
1 Time Period	F 0.94	R 0.97	F 0.943	R 0.971	(pc,	Rate /h) Ramp 437 Rate /h)	Freeway 9600  Segmen  Capa	Ramp 2100 t 2: Bas acity //h)	d Ra  F  0.44  ic  d Ra  0.40	R 0.21	F 71.9 Spe	R 63.9 eed i/h)	(pc/ Freeway 14.8	Ramp 20.9 nsity mi/ln)	C
1 Time Period	F 0.94	R 0.97	F 0.943	R 0.971	(pc, Freeway 4252 Flow (pc,	Rate /h) Ramp 437 Rate /h)	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa	Ramp 2100 t 2: Bas acity //h)	d Ra  F  0.44  ic  d Ra  0.	R 0.21	(mi F 71.9 Spo (mi	R 63.9 eed i/h)	(pc/ Freeway 14.8 De (pc/	Ramp 20.9 nsity mi/ln)	C LOS
1 Time Period 1 Time	F 0.94	R 0.97	F 0.943	R 0.971	Flow (pc)	Rate /h) Ramp 437 Rate /h)	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  Segment  Capa (pc)	Ramp 2100 t 2: Base acity (/h) 00 a: 3: Mercacity	d Ra  F  0.44  ic  d Ra  0.	R 0.21	(mi F 71.9 Spo (mi	eed i/h) 1.8	(pc/ Freeway 14.8 De (pc/	Ramp 20.9  nsity mi/ln) 2.6  nsity mi/ln)	C
1 Time Period 1 Time	PH 0.94	R 0.97	F 0.943	R 0.971	Flow (pc)	Rate /h) Ramp 437 Rate /h)	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  Segment  Capa (pc)	Ramp 2100 t 2: Base acity (/h) 00 c 3: Mere	d Ra  F 0.44  ic d Ra 0. ge	R 0.21	Spo (mi	R 63.9 eed i/h)	(pc/ Freeway 14.8 De (pc/	Ramp 20.9  nsity mi/ln) 2.6  nsity mi/ln)	C LOS
1 Time Period 1 Time Period 1	PH 0.94	R 0.97	F 0.943  ft 6.9	R 0.971	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  3977	Rate /h) Ramp 437 Rate /h) Rate /h)	Capa (pc  Freeway  9600  Segmen  Capa (pc  96  Segment  Capa (pc  Freeway	Ramp 2100 t 2: Base acity (/h) 00 3: Mercacity (/h) Ramp	d Ra F 0.44 ic dRa 0. ge dRa F	R 0.21	Spo (mi	eed i/h) R 63.9 eed i/h)	(pc/ Freeway 14.8 De (pc/ 1	Ramp 20.9  nsity mi/ln) 2.6  nsity mi/ln) Ramp	LOS B
1 Time Period 1 Time Period 1	PH 0.94  PH 0.94  PH 0.94  PH 0.94	R 0.97	fl 0.943 ft F 0.943 iod Re	R 0.971	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  3977	Rate /h) Ramp 437 Rate /h) 87 Rate /h) Ramp 190	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa (pc)  Freeway  9600	Ramp 2100 t 2: Base acity (/h) 00 3: Mercacity (/h) Ramp	d Ra F 0.44 ic d Ra 0. ge d Ra F 0.41	R 0.21 //c ntio R 0.09	Spo (mi	eed i/h) 1.8  R 63.9  R 64.7	(pc/ Freeway 14.8 De (pc/ 1 Freeway	Ramp 20.9  nsity mi/ln) 2.6  nsity mi/ln) Ramp	LOS B
1 Time Period 1 Time Period 1 Facility	PH 0.94  PH 0.94  PH 0.94  PH 0.94	R 0.97  HF 94  HF 0.99	fl 0.943 ft F 0.943 iod Re	R 0.971	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  3977	Rate /h) Ramp 437 Rate /h) 87 Rate /h) Ramp 190	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa (pc)  Freeway  9600	Ramp 2100 t 2: Base acity (/h) 00 a: 3: Mercular (/h) Ramp 2100	d Ra F 0.44 ic d Ra 0. ge d Ra F 0.41	R 0.21 //c ntio R 0.09	(mi F 71.9 Spe (mi 72 Spe (mi F 69.0	eed i/h) 1.8  R 63.9  R 64.7	(pc/ Freeway 14.8 De (pc/ 1 Freeway	nsity mi/ln) 20.9  nsity mi/ln) 2.6  nsity mi/ln) 16.7	LOS B
Time Period  1  Time Period  1  Time Period  1	F 0.94  PH 0.94  F 0.94  Y Time  Sp	R 0.97  HF 94  HF 0.99  e Perioeed, m 72.0	F 0.943  ft 0.943  ft F 0.943	R 0.971  IV  R 0.971  esult	Flow (pc) 378 Flow (pc) 378 Flow (pc) 377 Flow (pc) 377 Freeway 3977 S Density, pc	Rate /h) Ramp 437 Rate /h) 87 Rate /h) Ramp 190	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa (pc)  Freeway  9600	Ramp 2100 t 2: Base acity (/h) 00 3: Mercacity (/h) Ramp 2100	d Ra F 0.44 ic d Ra 0. ge d Ra F 0.41	R 0.21 //c ntio R 0.09	Spo (mi 72 Spo (mi F 69.0	eed i/h) 1.8  R 63.9  R 64.7	(pc/ Freeway 14.8 De (pc/ 1 Freeway	Ramp 20.9  nsity mi/ln) 2.6  Ramp 16.7  LOS	LOS B
Time Period  1  Time Period  1  Time Period	F 0.94  PH 6.94  PH 5 0.94  y Time Sp	R 0.97  HF 94  HF 0.99  e Perioeed, m 72.0	fl fl f f o.943	R 0.971  IV  R 0.971  esult	Flow (pc) 378 Flow (pc) 378 Flow (pc) 377 Flow (pc) 377 Freeway 3977 S Density, pc	Rate /h) Ramp 437 Rate /h) 87 Rate /h) Ramp 190	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa (pc)  Freeway  9600	Ramp 2100 t 2: Base acity (/h) 00 3: Mercacity (/h) Ramp 2100	d Ra F 0.44 ic d Ra 0. ge d Ra F 0.41	R 0.21 //c ottio 39 //c ottio R 0.09	Spo (mi 72 Spo (mi F 69.0	eed i/h) 1.8  R 63.9  R 64.7	(pc/ Freeway 14.8 De (pc/ 1 Freeway	Ramp 20.9  nsity mi/ln) 2.6  Ramp 16.7  LOS	LOS B

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Comments	

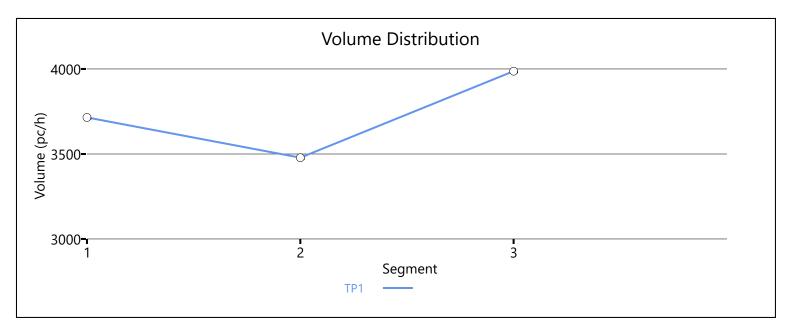


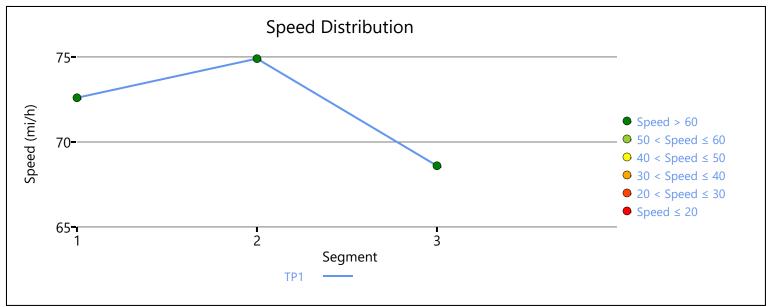


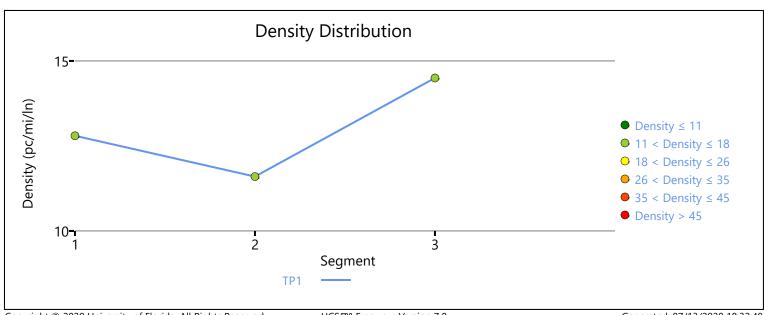


					НС	S7 Fr	eeway l	Facilitie	es Re	port						
Projec	t Info	rmat	ion													
Analyst					Fehr & Pee	ers		Date					6/30/2020			
Agency					Caltrans &	City of V	allejo	Analysis Year					2024			
Jurisdicti	ion				Caltrans			Time Period Analyzed					AM Peak Hour			
Project D	Descripti	on			I-80 Hidde	nbrooke	TOAR	Unit					United Sta	tes Custom	ary	
Facilit	y Gloł	oal In	put													
Jam Den	nsity, pc/	mi/ln			190.0			Density at	t Capac	ity, pc/n	ni/ln		45.0			
Queue D	Discharge	e Capac	ity Dro	o, %	7			Total Segi	ments				3			
Total Tim	ne Perio	ds			1			Time Peri	od Dura	ation, m	in		15			
Facility L	ength, n	ni			0.99											
Facilit	y Segi	ment	Data													
No.		Coded			Analyzed			Name			L	ength,	ft	Lane	es	
1		Diverge			Diverge	1-8	80 EB - Ame	rican Cany Ramp	on Road	d Off-		1500		4		
2		Basic			Basic	1-8	80 EB - Ame to	d Off-		2220		4				
3		Merge			Merge	1-8	I-80 EB - American Canyon Road On- Ramp					1500 4				
Facility							egment								LOS	
Time Period	PI	4F	fl	IV	Flow (pc		Capa (po	acity :/h)			Speed (mi/h)			Pensity c/mi/ln)		
	F	R										,,	(pc/i	,,		
1	0.94				Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
		0.76	0.943		Freeway 3715	<b>Ramp</b> 285	Freeway 9600	1	<b>F</b> 0.39	<b>R</b> 0.14	<b>F</b> 72.6		-		В	
		0.76	0.943		-	285		<b>Ramp</b> 2100	0.39			R	Freeway	Ramp	В	
Time Period	Pi				-	285 Rate	9600  Segmen  Capa	<b>Ramp</b> 2100	0.39 i <b>c</b>		72.6	<b>R</b> 64.3	Freeway 12.8	Ramp	LOS	
	Pi 0.5	-IF	fl	0.971	3715	285 Rate /h)	9600 Segmen Capa (po	Ramp 2100 t 2: Basing	0.39	0.14 /c	72.6 Spe (mi	R 64.3	Freeway 12.8 Der (pc/i	Ramp 18.0		
Period		-IF	fl	0.971	3715 Flow (pc,	285  Rate /h)	9600 Segmen Capa (po	2100 t 2: Basinacity //h)	0.39 ic d, Ra	0.14 /c tio	72.6 Spe (mi	R 64.3 eed (/h)	Freeway 12.8 Der (pc/i	Ramp 18.0	LOS	
Period		<b>HF</b> 94	fl- 0.9	0.971	3715 Flow (pc,	285  Rate /h) 78  Rate	9600  Segmen  Capa (pc) 96  Segment  Capa	2100 t 2: Basinacity //h)	0.39 ic	0.14 /c tio	72.6 Spe (mi	R 64.3 eed (/h)	Freeway 12.8  Dei (pc/i	Ramp 18.0	LOS	
Period 1 Time	0.9	<b>HF</b> 94	fl- 0.9	0.971 IV 043	3715  Flow (pc. 34	285  Rate /h) 78  Rate	9600  Segmen  Capa (pc) 96  Segment  Capa	Ramp 2100 t 2: Basinacity (/h) 00 a 3: Mercacity	0.39 ic	0.14 /c tio 36	72.6 Spe (mi	R 64.3	Freeway 12.8  Dei (pc/i	Ramp 18.0 nsity ni/ln) 1.6	LOS	
Period 1 Time	0.9	1F 94 1F	6H 0.9	0.971 IV 043	Flow (pc. 34	285  Rate /h) 78  Rate /h)	9600  Segmen  Capa (pc	Ramp 2100 t 2: Basic acity (/h) 00 c 3: Merc	0.39 ic d Ra 0.	0.14 /c tio 36 /c tio	72.6 Spo (mi	R 64.3 eed /h)	Preeway 12.8  Der (pc/1	Ramp 18.0 nsity mi/ln) 1.6 nsity mi/ln)	LOS	
1 Time Period	0.94	HF 94 HF R 0.93	fH 0.9 fH F 0.943	0.971  IV  043  IV  R  0.971	Flow (pc, 34) Flow (pc, 34) Freeway 3987	Rate/h) 78 Rate/h) Ramp	9600  Segment  Capa (pc  Segment  Capa (pc  Freeway	Ramp 2100 t 2: Basicacity (/h) 00 a: Mercusacity (/h) Ramp	0.39 ic d Ra 0. ge d Ra F	0.14 /c tio 36 /c tio R	Spe (mi	R 64.3	Preeway 12.8  Der (pc/r 1  Der (pc/r Freeway	Ramp  18.0  18.0  1.6  1.6  1.6  Ramp	LOS B	
1 Time Period	0.94  F 0.94	HF 94 HF R 0.93	fh 0.943	0.971  IV  043  IV  R  0.971	Flow (pc, 34) Flow (pc, 34) Freeway 3987	285  Rate /h)  78  Rate /h)  Ramp  509	9600  Segment  Capa (pc  96  Segment  Capa (pc  Freeway  9600	Ramp 2100 t 2: Basicacity (/h) 00 a: Mercusacity (/h) Ramp	0.39 ic d Ra 0. ge d Ra 7.	0.14 /c tio 36 /c tio R 0.24	Spe (mi	R 64.3 eed (/h) l.9 eed (/h) R 64.4	Preeway 12.8  Der (pc/r 1  Preeway 14.5	Ramp  18.0  18.0  1.6  1.6  1.6  Ramp	LOS B	
Time Period  1  Facility	0.94  F 0.94	HF 94 HF R 0.93	fh 0.943	0.971  IV  043  IV  R  0.971	Flow (pc) 34  Flow (pc) Freeway 3987	Rate /h) 78 Rate /h) Ramp 509	9600  Segment  Capa (pc  96  Segment  Capa (pc  Freeway  9600	Ramp 2100 t 2: Basicacity (/h) 00 a: Merconacity (/h) Ramp 2100	0.39 ic d Ra 0. ge d Ra 7.	0.14 /c tio 36 /c tio R 0.24	72.6  Spe (mi 74  Spe (mi F 68.6	R 64.3 eed /h) i.9 eed /h) R 64.4	Preeway 12.8  Der (pc/r 1  Preeway 14.5	Ramp 18.0  nsity mi/ln) 1.6  nsity ni/ln) Ramp 18.4	LOS B	
Time Period  1  Facility T	0.94  F 0.94  Sp	HF 94 HF 0.93 e Perioeed, m 72.2	fh 0.943 iod Ro	0.971  IV  R  0.971  esult:	Flow (pc, 34) Flow (pc, 34) Freeway 3987  Density, pc	Rate /h) 78 Rate /h) Ramp 509	9600  Segment  Capa (pc  96  Segment  Capa (pc  Freeway  9600	Ramp 2100 t 2: Basicacity (/h) 00 a: 3: Merconicular (/h) Ramp 2100	0.39 ic d Ra 0. ge d Ra 7.	0.14 /c tio 36 /c tio R 0.24	Spe (mi 74 Spe (mi F 68.6	R 64.3 eed /h) i.9 eed /h) R 64.4	Preeway 12.8  Der (pc/r 1  Preeway 14.5	Ramp 18.0  18.0  nsity mi/ln) 1.6  Ramp 18.4	LOS B	
Time Period  1  Facility	PI F 0.94  Ty Time Sp	HF 94 HF R 0.93 e Peri	fl- 0.9  fl-  F 0.943  fod Roni/h	0.971  IV  R  0.971  esult:	Flow (pc, 34) Flow (pc, 34) Freeway 3987  Density, pc	Rate /h) 78 Rate /h) Ramp 509	9600  Segment  Capa (pc  96  Segment  Capa (pc  Freeway  9600	Ramp 2100 t 2: Basicacity (/h) 00 a: 3: Merconicular (/h) Ramp 2100	0.39 ic d Ra 0. ge d Ra F 0.42	0.14 /c tio 36 /c tio R 0.24	Spe (mi 74 Spe (mi F 68.6	R 64.3 eed /h) i.9 eed /h) R 64.4	Preeway 12.8  Der (pc/r 1  Preeway 14.5	Ramp 18.0  18.0  nsity mi/ln) 1.6  Ramp 18.4	LOS B	

Messages	
WARNING 1	Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
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Comments	

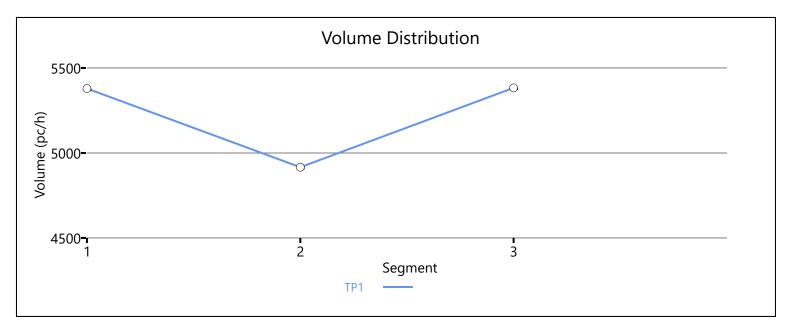


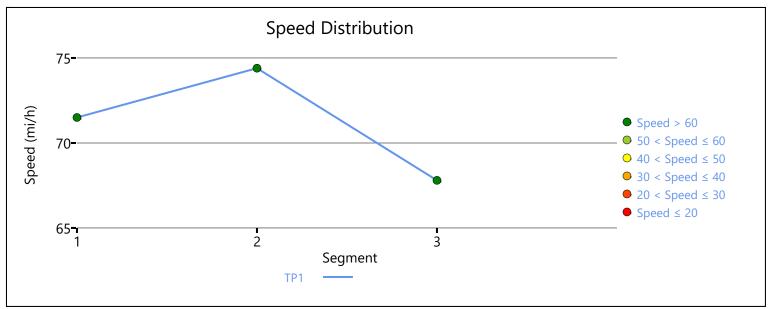


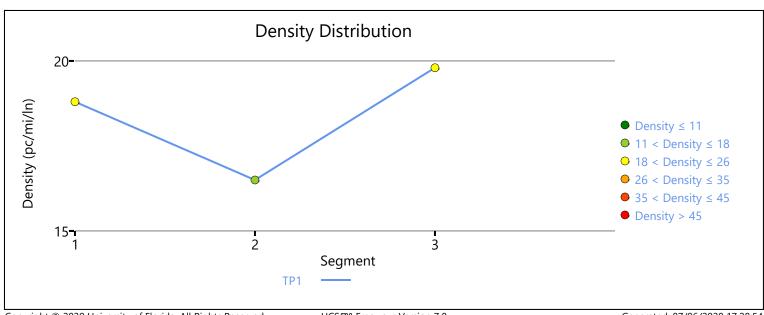


					НС	S7 Fr	eeway l	- acilitie	es Re	port					
Projec	t Info	rmat	ion	_											
Analyst					Fehr & Peers			Date					6/30/2020		
Agency				Caltrans & City of Vallejo			Analysis Year					2024			
Jurisdiction				Caltrans			Time Peri	od Anal	yzed			PM Peak Hour			
Project Description				I-80 Hidde	nbrooke	TOAR	Unit					United Sta	tes Custom	ary	
Facilit	y Glok	oal In	put												
Jam Den	ım Density, pc/mi/ln 190.0				190.0			Density a	Capac	ity, pc/r	ni/ln		45.0		
Queue D	Discharge	e Capac	ity Dro	э, %	7			Total Segi	ments				3		
Total Tim	ne Period	ds			1			Time Peri	od Dura	ation, m	in		15		
Facility L	ength, n	ni			0.99										
Facilit	y Segi	ment	Data												
No.		Coded			Analyzed			Name			L	ength,	ft	Lane	es
1	I	Diverge			Diverge	1-8	80 EB - Ame	rican Cany Ramp	on Road	d Off-		1500		4	
2		Basic			Basic	1-8	80 EB - Ame to	rican Cany On-Ramp		d Off-		2220		4	
3		Merge			Merge	1-8	I-80 EB - American Canyon Road O Ramp			d On-		1500		4	
Facility	y Segi	ment	Data			S	egment	1: Diver	ge						
Time Period	Pi	4F	fŀ	IV	Flow	D . 1 .	Τ -						Density LOS (pc/mi/ln)		
					(pc,		Capa (pc	acity /h)		/c tio	Spe (mi				LOS
	F	R	F	R	1					-					LOS
1	0.94	<b>R</b> 0.89	<b>F</b> 0.943	<b>R</b> 0.971	(pc,	/h)	(pc	/h)	Ra	tio	(mi	/h)	(pc/n	ni/ĺn)	<b>LOS</b>
1					(pc,	/h) Ramp 474	(pc	/h) Ramp 2100	<b>F</b> 0.56	tio R	(mi	/h) R	(pc/n	ni/ľn) Ramp	
1 Time Period		0.89	0.943		(pc,	Ramp 474 Rate	Freeway 9600 Segmen	Ramp 2100 t 2: Basicacity	Ra F 0.56 iC d	tio R	(mi F 71.5	<b>R</b> 63.7	(pc/n Freeway 18.8	Ramp 25.1	
Time	0.94	0.89	0.943	0.971	Freeway 5379 Flow	Ramp 474  Rate /h)	Freeway 9600 Segmen Capa (pc	Ramp 2100 t 2: Basicacity	F 0.56 iC d Ra	R 0.23	(mi F 71.5	R 63.7 eed (/h)	(pc/n Freeway 18.8  Den (pc/n	Ramp 25.1	С
Time Period	0.94	0.89	0.943	0.971	Freeway 5379 Flow (pc)	Ramp 474  Rate /h)	Freeway 9600 Segmen Capa (pc	Ramp 2100 t 2: Basinacity /h)	Ra F 0.56 C d Ra 0.0	R 0.23	F 71.5 Spe	R 63.7 eed (/h)	(pc/n Freeway 18.8  Den (pc/n	Ramp 25.1 sity ni/ln)	C
Time Period	0.94	0.89 <b>HF</b> 94	0.943 <b>f</b> H	0.971	Freeway 5379 Flow (pc)	Ramp 474  Rate /h)  Rate	Freeway 9600  Segmen  Capa (pc	Ramp 2100 t 2: Basicacity /h) 00 3: Merconcity	Ra F 0.56 ic d Ra 0.	R 0.23	(mi F 71.5	R 63.7 eed (/h)	(pc/n Freeway 18.8  Den (pc/n	Ramp 25.1 sity ni/ln) 5.5	C LOS
Time Period 1	0.94 PH	0.89 <b>HF</b> 94	0.943 <b>f</b> H	0.971 IV	Flow (pc. 49	Ramp 474  Rate /h)  Rate	Freeway 9600  Segmen Capa (pc	Ramp 2100 t 2: Basicacity /h) 00 3: Merconcity	Ra F 0.56 ic d Ra 0.	R 0.23	(mi F 71.5	R 63.7	(pc/n Freeway 18.8  Den (pc/n 16	Ramp 25.1 sity ni/ln) 5.5	C
Time Period 1	0.94 PH 0.9	0.89 <b>IF</b> 94	0.943 fh 0.9	0.971 IV 143	Flow (pc)	Ramp 474  Rate /h)  16  Rate /h)	Freeway 9600  Segmen Capa (pc	Ramp 2100 t 2: Basicacity /h) 00 3: Mergacity /h)	Ra F 0.56 ic d Ra 0.	rtio R 0.23 /c tio 51 /c tio	(mi F 71.5 Spe (mi 74	R 63.7	(pc/n Freeway 18.8  Den (pc/n 16	Ramp 25.1 sity ni/ln) 5.5 sity ni/ln)	C LOS
Time Period 1 Time Period	0.94 PI 0.94 PI 0.94	0.89  HF  94  HF  0.97	0.943 fh 0.943	0.971  IV  A3  IV  R  0.971	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  5383	Ramp 474  Rate /h)  Rate /h)  Rate /h)  Ramp	Freeway  9600  Segmen  Capa (pc  96  Segment  Capa (pc  Freeway	Ramp 2100 t 2: Basicity /h) 00 3: Merconcity /h) Ramp	Ra F 0.56 ic d Ra 0. ge d Ra F	rtio R 0.23 /c tio 51 /c tio R	(mi F 71.5 Spo (mi 74 Spo (mi	R 63.7 eed //h) 1.4 eed //h) R	(pc/n Freeway  18.8  Den (pc/n  16  Den (pc/n  Freeway	Ramp 25.1 sity ni/ln) 5.5 sity ni/ln) Ramp	LOS B
Time Period 1 Time Period	0.94 PH 0.94 F 0.94 Time	0.89  HF  94  HF  0.97	0.943 fh 0.943 fh F 0.943	0.971  IV  A3  IV  R  0.971	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  5383	Ramp 474  Rate /h) 16  Rate /h)  Rate /h)  Rate /h)  Ramp 467	Freeway 9600  Segment Capa (pc 96  Segment Capa (pc 96  Freeway 9600	Ramp 2100 t 2: Basicity /h) 00 3: Merconcity /h) Ramp	Ra F 0.56  c d Ra 0. ge d Ra F 0.56	/c tio /c tio R 0.22	(mi F 71.5 Spo (mi 74 Spo (mi	eed (/h)4  eed (/h)4  eed (/h)4	(pc/n Freeway 18.8  Den (pc/n 16  Den (pc/n 17 Freeway 19.8	Ramp 25.1 sity ni/ln) 5.5 sity ni/ln) Ramp	LOS B
Time Period  Time Period	0.94 PH 0.94 F 0.94 Time	0.89  HF  94  HF  0.97  e Peri	0.943 fh 0.943 fh F 0.943	0.971  IV  A3  IV  R  0.971	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  5383	Ramp 474  Rate /h) 16  Rate /h) Rate /h) A67	Freeway 9600  Segment Capa (pc 96  Segment Capa (pc 96  Freeway 9600	Ramp 2100 t 2: Basicacity /h) 00 3: Mercity /h) Ramp 2100	Ra F 0.56  c d Ra 0. ge d Ra F 0.56	/c tio /c tio R 0.22	(mi F 71.5 Spe (mi 74 Spe (mi F 67.8	R 63.7	(pc/n Freeway 18.8  Den (pc/n 16  Den (pc/n 17 Freeway 19.8	sity ni/ln)  sity ni/ln)  sity ni/ln)  Ramp  22.6	LOS B
Time Period  1  Time Period  1  Facility T	0.94 PI 0.94 PI F 0.94  Time Sp	0.89  HF  94  HF  0.97  e Periodeed, m  71.5	0.943  fh 0.943  fh F 0.943  iod Roni/h	0.971  IV  R  0.971  esult	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  5383  Density, pc	Ramp 474  Rate /h) 16  Rate /h) Rate /h) A67	Freeway 9600  Segment Capa (pc 96  Segment Capa (pc 96  Freeway 9600	Ramp 2100 t 2: Basicacity /h) 00 3: Mergacity /h) Ramp 2100	Ra F 0.56  c d Ra 0. ge d Ra F 0.56	/c tio /c tio R 0.22	Spo (mi 74 Spo (mi F 67.8	R 63.7	(pc/n Freeway 18.8  Den (pc/n 16  Den (pc/n 17 Freeway 19.8	Ramp 25.1 sity ni/ln) 5.5 sity ni/ln) Ramp 22.6 LOS	LOS B
Time Period  1  Time Period  1  Facility	0.94  PH  F  0.94  Y Time  Sp	0.89  HF  94  HF  0.97  e Perioeed, m  71.5	o.943  fth o.9  fth F o.943  fod Roni/h	0.971  IV  R  0.971  esult	Flow (pc) Freeway  Flow (pc)  Freeway  Flow (pc)  Freeway  5383  Density, pc	Ramp 474  Rate /h) 16  Rate /h) Rate /h) A67	Freeway 9600  Segment Capa (pc 96  Segment Capa (pc 96  Freeway 9600	Ramp 2100 t 2: Basicacity /h) 00 3: Mergacity /h) Ramp 2100	Ra F 0.56 ic d Ra 0. ge d Ra F 0.56	rtio R 0.23 /c tio 51 /c tio R 0.22	Spo (mi 74 Spo (mi F 67.8	R 63.7	(pc/n Freeway 18.8  Den (pc/n 16  Den (pc/n 17 Freeway 19.8	Ramp 25.1 sity ni/ln) 5.5 sity ni/ln) Ramp 22.6 LOS	LOS B

Messages	
WARNING 1	Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
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Comments	

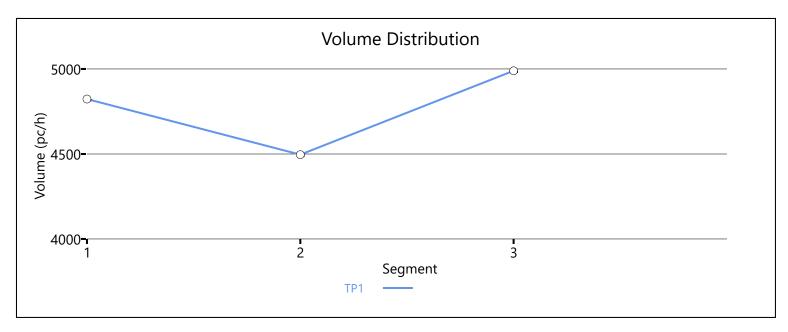


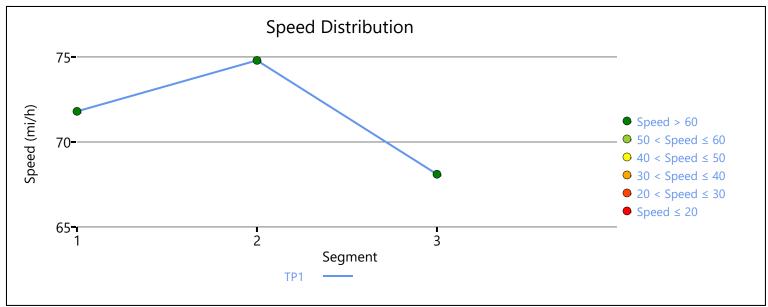


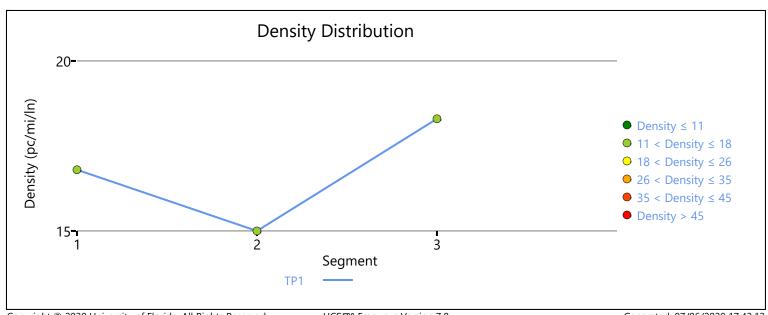


					НС	S7 F	reeway l	- acilitie	es Re	eport					
Projec	ct Info	rmat	ion												
Analyst					Fehr & Pee	Fehr & Peers			Date				6/30/2020		
Agency Ca				Caltrans & City of Vallejo			Analysis Year					2024			
Jurisdiction Caltrans						Time Peri	od Anal	yzed			AM Peak Hour				
Project Description I-80 Hiddenbro					nbrook	e TOAR	Unit					United States Customary			
Facilit	ty Glo	bal In	put												
Jam Der	lam Density, pc/mi/ln 190.0						Density a	t Capac	ity, pc/r	ni/ln		45.0			
Queue [	Discharg	e Capac	ity Dro	p, %	7			Total Seg	ments				3		
Total Tin					1			Time Peri	od Dura	ation, m	in		15		
Facility L	Length, ı	ni			0.93										
Facilit	ty Seg	ment	Data												
No.		Coded			Analyzed			Name			L	ength,	ft	La	nes
1		Diverge	<b>!</b>		Diverge	1	-80 WB - Ame	rican Cany Ramp	on Roa	d Off-		1500			4
2		Basic			Basic	ı	-80 WB - Ame to	rican Cany On-Ramp		d Off-		1900			4
3		Merge			Merge	1	I-80 WB - American Canyon Road Ramp		d On-	1500		) 4		4	
Facilit	ty Seg	ment	Data												
							Segment	1: Dive	ge						
Time Period		HF	fŀ	łV	Flow (pc)		Capa (pc	acity /h)		/c tio		eed i/h)		ensity c/mi/ln)	LOS
	F	R	F	R	Freeway	Ramı	p Freeway	Ramp	F	R	F	R	Freewa	ay Ramp	
1	0.94	0.71	0.943	0.971	4823	421	9600	2100	0.50	0.20	71.8	63.9	16.8	22.9	С
							Segmen	t 2: Bas	ic						
Time Period		HF	fŀ	łV				acity d/c c/h) Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0	94	0.9	943	449	96	96	00	0.	47	74	1.8		15.0	В
							Segment	3: Mer	ge						
Time Period		HF	fŀ	łV	Flow (pc,		Capa (pc			/c tio		eed i/h)		ensity c/mi/ln)	LOS
	F	R	F	R	Freeway	Ramı	p Freeway	Ramp	F	R	F	R	Freewa	ay Ramp	
1	0.94	0.96	0.943	0.971	4989	493	9600	2100	0.52	0.23	68.1	64.1	18.3	21.2	С
Facilit	ty Tim	e Per	iod R	esult	S										
Т	S	peed, n	ni/h		Density, po	c/mi/ln	Densi	ity, veh/m	i/ln	Tra	vel Tin	ne, min	1	LO	s
1		71.6			16.6	5		15.6			0.80	0		С	
Facilit	ty Ove	rall R	esult	S											
Space M	lean Spe	ed, mi/	h		71.6			Density, w	eh/mi/l	n			15.6		
Average	Travel 1	ime, mi	n		0.80			Density, p	c/mi/ln				16.6		

Messages	
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Comments	

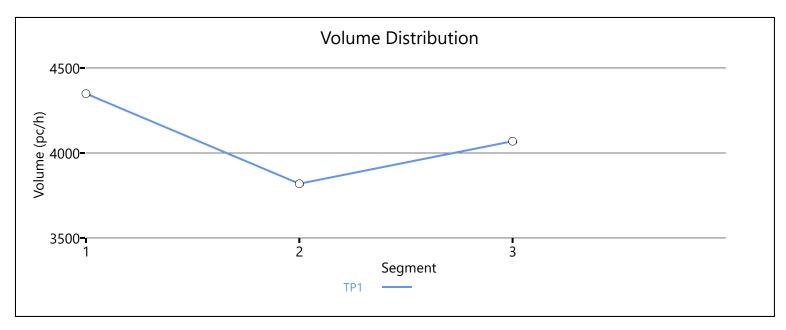


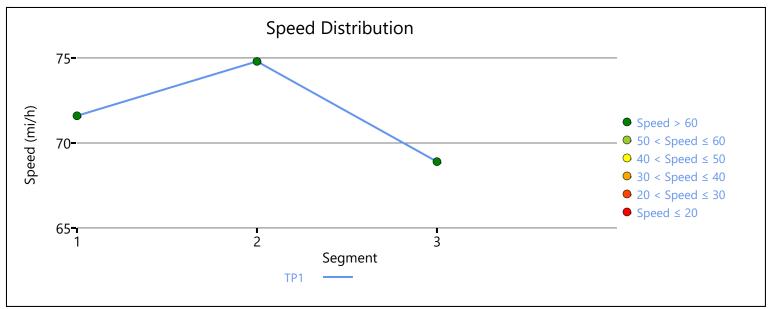


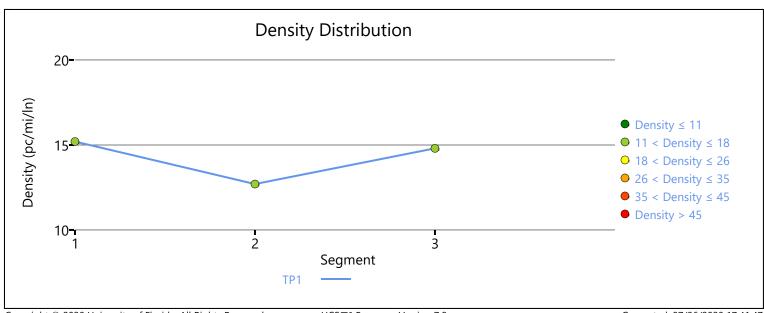


					НС	CS7 Fr	eeway l	Facilitie	es Re	eport						
Projec	t Info	rmat	ion	_												
Analyst					Fehr & Peers			Date					6/30/2020			
Agency				Caltrans & City of Vallejo			Analysis Year					2024				
Jurisdiction				Caltrans			Time Peri	od Anal	lyzed			AM Peak Hour				
Project Description				I-80 Hidde	nbrooke	TOAR	Unit					United Sta	ates Custom	ary		
Facilit	y Glok	oal In	put													
Jam Den	m Density, pc/mi/ln 190.0				190.0			Density a	t Capac	ity, pc/r	ni/ln		45.0			
Queue D	Discharge	e Capac	ity Dro	р, %	7			Total Segi	ments				3			
Total Tim	ne Period	ds			1			Time Peri	od Dura	ation, m	in		15			
Facility L	ength, n	ni			0.93											
Facilit	y Segi	ment	Data													
No.		Coded			Analyzed			Name			L	ength,	ft	Lane	es	
1	[	Diverge			Diverge	1-8	80 WB - Ame	erican Cany Ramp	on Roa	d Off-		1500		4		
2		Basic		Г	Basic	1-8	BO WB - Ame	erican Cany o On-Ramp		d Off-		1900		4		
3		Merge			Merge	1-8	I-80 WB - American Canyon Ro Ramp			d On-	1500			4		
Facility	y Segi	ment	Data													
Time						S	egment	1: Diver	rge							
Period	Pł	НF	fŀ	łV	Flow (pc	Rate	Сара		d	/c itio	Spe (mi			nsity mi/ln)	LOS	
_	F	lF R	fl-	IV R		Rate	Сара	acity	d	-				mi/ĺn)	LOS	
				R	(pc,	Rate /h)	Capa (po	acity /h)	d Ra	itio	(mi	i/h)	(pc/	mi/ĺn)	<b>LOS</b>	
Period	F	R	F	R	(pc)	Rate /h) Ramp	Capa (pc	Ramp	d Ra F 0.45	rtio R	(mi	i/h) R	(pc/	mi/ln) Ramp		
Period	F	<b>R</b> 0.97	<b>F</b> 0.943	R	(pc)	Rate /h) Ramp 499	Capa (pc) Freeway 9600  Segmen Capa	Ramp	d Ra F 0.45	rtio R	(mi F 71.6	R 63.7	(pc/liferally) Freeway 15.2 De	mi/ln) Ramp		
Period  1  Time	<b>F</b> 0.94	R 0.97	F 0.943	<b>R</b> 0.971	(pc, Freeway 4349	Rate /h) Ramp 499	Freeway 9600  Segmen Capa	Ramp 2100 t 2: Basicacity	d Ra F 0.45	R 0.24	F 71.6 Spe	(h) R 63.7	(pc/l	Ramp 21.5	С	
1 Time Period	F 0.94	R 0.97	F 0.943	R 0.971	Freeway 4349 Flow (pc)	Rate /h)	Freeway 9600  Segmen Capa	Ramp 2100 t 2: Basingtity /h) 00	d Ra  F  0.45  ic  d Ra  0.45	R 0.24	F 71.6 Spe	R 63.7 eed i/h)	(pc/l	Ramp 21.5  nsity mi/ln)	C	
1 Time Period	F 0.94	R 0.97	F 0.943	R 0.971	Freeway 4349 Flow (pc)	Rate /h) Ramp 499 Rate /h)	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa	Ramp 2100 t 2: Basingtity /h) 00	d Ra  F  0.45  ic  d Ra  0.	R 0.24	(mi F 71.6	R 63.7 eed i/h)	(pc/lifety) 15.2  Dec (pc/lifety) 1	Ramp 21.5  nsity mi/ln)	C LOS	
1 Time Period 1 Time	F 0.94	R 0.97	F 0.943	R 0.971	Flow (pc)	Rate /h) Ramp 499 Rate /h)	Capa (pc)  Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa	Ramp 2100 t 2: Basing in the control of the control	d Ra  F  0.45  ic  d Ra  0.	R 0.24 /c otto	(mi F 71.6	R 63.7 eed i/h)	(pc/lifety) 15.2  Dec (pc/lifety) 1	Ramp 21.5  nsity mi/ln) 2.7	C	
1 Time Period 1 Time	PH 0.94	R 0.97	F 0.943	R 0.971	Flow (pc)	Rate /h)  Ramp 499  Rate /h)  19  Rate /h)	Capa (pc) Freeway 9600 Segmen Capa (pc) Segment Capa (pc)	Ramp 2100 t 2: Basicacity /h) 00 3: Mergacity /h)	d Ra  F 0.45  ic d Ra 0. ge d Ra	R 0.24	(mi F 71.6 Spe (mi 74	R 63.7 eed i/h)	(pc/life) Freeway 15.2  De (pc/life)  De (pc/life)	Ramp 21.5  nsity mi/ln) 2.7	C LOS	
1 Time Period 1 Time Period 1	PH 0.94	R 0.97	F 0.943  ft- 0.943	R 0.971	Flow (pc) 38 Flow (pc) 4069	Rate /h) Ramp 499 Rate /h) 19 Rate /h) Ramp	Capa (pc) Freeway  9600  Segmen  Capa (pc)  96  Segment  Capa (pc)  Freeway	Ramp 2100 t 2: Basicacity /h) 00 3: Mercusacity /h) Ramp	d Ra F 0.45 ic d Ra 0. ge d Ra F	/c titio // R R	(mi F 71.6 Spo (mi 74 Spo (mi	R 63.7 eed i/h) 1.8	(pc/lifety)  Freeway  15.2  De (pc/lifety)  The property of th	Ramp 21.5  nsity mi/ln) 2.7  nsity mi/ln) Ramp	LOS B	
1 Time Period 1 Time Period 1	PH 0.94  PH 0.94  PH 0.94  PH 0.94	R 0.97	F 0.943  ft 0.943	R 0.971	Flow (pc) 38 Flow (pc) 4069	Rate /h)  Ramp 499  Rate /h)  19  Rate /h)  Ramp 250	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Basicacity /h) 00 3: Mercusacity /h) Ramp	d Ra F 0.45 ic d Ra 0. ge d Ra F 0.42	/c etio / R 0.12	(mi F 71.6 Spo (mi 74 Spo (mi	eed i/h) 1.8  R 63.7  eed i/h) R 64.6	(pc/lifety)  Freeway  15.2  De (pc/lifety)  The property of th	Ramp 21.5  nsity mi/ln) 2.7  nsity mi/ln) Ramp	LOS B	
1 Time Period 1 Time Period 1 Facility	PH 0.94  PH 0.94  PH 0.94  PH 0.94	R 0.97  HF 94  HF 0.99	F 0.943  ft 0.943	R 0.971	Flow (pc) 38 Flow (pc) 4069	Rate /h)  Ramp 499  Rate /h)  19  Rate /h)  Ramp 250	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Basinacity /h) 00 3: Merculacity /h) Ramp 2100	d Ra F 0.45 ic d Ra 0. ge d Ra F 0.42	/c etio / R 0.12	(mi F 71.6 Spe (mi 74 Spe (mi F 68.9	R 63.7 eed i/h) 1.8 R 64.6	(pc/lifety)  Freeway  15.2  De (pc/lifety)  The property of th	Ramp 21.5  nsity mi/ln) 2.7  nsity mi/ln)  Ramp 17.3	LOS B	
Time Period  1  Time Period  1  Time Period  1	F 0.94  PH 0.94  F 0.94  Y Time  Sp	R 0.97  HF 94  HF 0.99  e Perioded, m 71.9	F 0.943  ft- 0.943  ft- 0.943  ft- ft- ft- ft- ft- ft- ft- ft- ft- ft	R 0.971  IV  R 0.971  esult	Flow (pc) 38 Flow (pc) 38 Flow (pc) 38 Flow (pc) 38 Flow (pc) 4069 Freeway	Rate /h)  Ramp 499  Rate /h)  19  Rate /h)  Ramp 250	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Basicacity /h) 00 3: Mergacity /h) Ramp 2100	d Ra F 0.45 ic d Ra 0. ge d Ra F 0.42	/c etio / R 0.12	Spo (mi 74 Spo (mi F 68.9	R 63.7 eed i/h) 1.8 R 64.6	(pc/lifety)  Freeway  15.2  De (pc/lifety)  The property of th	Ramp 21.5  nsity mi/ln) 2.7  Ramp 17.3	LOS B	
Time Period  1  Time Period  1  Time Period	F 0.94  PH 6.94  PH 5 0.94  y Time Sp	R 0.97  HF 94  HF 0.99  e Perioeed, m 71.9	fl fl f f o.943	R 0.971  IV  R 0.971  esult	Flow (pc) 38 Flow (pc) 38 Flow (pc) 38 Flow (pc) 38 Flow (pc) 4069 Freeway	Rate /h)  Ramp 499  Rate /h)  19  Rate /h)  Ramp 250	Capa (pc) Freeway 9600  Segment Capa (pc) 96  Segment Capa (pc) Freeway 9600	Ramp 2100 t 2: Basicacity /h) 00 3: Mergacity /h) Ramp 2100	d Ra F 0.45 ic d Ra 0. ge d Ra F 0.42	/c tio /c tio / R 0.12	Spo (mi 74 Spo (mi F 68.9	R 63.7 eed i/h) 1.8 R 64.6	(pc/lifety)  Freeway  15.2  De (pc/lifety)  The property of th	Ramp 21.5  nsity mi/ln) 2.7  Ramp 17.3	LOS B	

Messages	
WARNING 1	Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
WARNING 2	Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.
Comments	







#### Intersection 1

### American Canyon Rd/I-80 WB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn	312	298	95.5%	9.1	0.6	Α
NB	Through	116	120	103.6%	10.4	0.8	В
IND	Right Turn						
	Subtotal	428	418	97.7%	9.5	0.6	Α
	Left Turn						
SB	Through	319	328	102.9%	10.6	1.2	В
36	Right Turn	50	42	83.3%	6.3	1.2	Α
	Subtotal	369	370	100.2%	10.1	1.1	В
	Left Turn						
EB	Through						
LB	Right Turn						
	Subtotal						
	Left Turn	17	10	61.3%	7.0	2.3	Α
WB	Through	1	1	74.4%	2.6	5.5	Α
VVD	Right Turn	218	213	97.8%	4.5	0.5	Α
	Subtotal	236	224	95.0%	4.7	0.5	Α
	Total	1,033	1,012	98.0%	8.6	0.6	Α

#### Intersection 2

### American Canyon Rd/I-80 EB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total Delay (sec/veh)			
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS	
	Left Turn							
NB	Through	357	347	97.1%	7.0	0.3	Α	
IND	Right Turn	77	73	95.2%	4.8	0.4	Α	
	Subtotal	434	420	96.8%	6.6	0.3	Α	
	Left Turn	297	304	102.5%	9.5	0.5	Α	
SB	Through	39	32	82.0%	10.3	0.6	В	
36	Right Turn							
	Subtotal	336	336	100.1%	9.6	0.5	Α	
	Left Turn	71	74	104.8%	6.2	0.9	Α	
EB	Through	6	6	93.0%	9.3	4.0	Α	
LD	Right Turn	86	87	101.7%	3.7	0.7	Α	
	Subtotal	163	167	102.7%	5.0	0.7	Α	
	Left Turn							
WB	Through							
VVD	Right Turn							
	Subtotal							
	Total	933	924	99.0%	7.4	0.3	Α	

Fehr & Peers 7/6/2020

SimTraffic Post-Processor Average Results from 10 Runs Volume and Delay by Movement I-80 Hiddenbrooke Interchange TOAR
Existing Conditions
AM Peak Hour

Intersection 3

### Hiddenbrooke Parkway/McGary Rd

**Side-street Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	409	397	97.0%	26.6	12.5	D
ND	Right Turn	7	7	106.3%	12.5	9.0	В
	Subtotal	416	404	97.2%	26.5	12.6	D
	Left Turn	5	4	81.8%	0.5	0.6	Α
SB	Through	119	114	96.0%	0.8	0.1	Α
36	Right Turn	1	1	74.4%	0.0	0.1	Α
	Subtotal	125	119	95.2%	0.8	0.1	Α
	Left Turn	1	2	186.0%	1.5	2.4	Α
EB	Through						
LB	Right Turn						
	Subtotal	1	2	186.0%	1.5	2.4	Α
	Left Turn	4	3	74.4%	2.8	3.3	Α
WB	Through						
VVD	Right Turn	24	21	88.4%	3.2	8.0	Α
	Subtotal	28	24	86.4%	3.4	0.9	Α
	Total	570	549	96.4%	19.7	8.5	С

Fehr & Peers 7/6/2020

I-80 Hiddenbrooke Interchange TOAR
Existing Conditions
AM Peak Hour

Intersection 1

#### American Canyon Rd/I-80 WB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qu	ueue (ft)	Maximum	Queue (ft)	Block	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
NB	Left/Through	440	60	9	80	17	80	21	0%	0%
	Through /Dight	1.040	90	10	100	20	120	25	09/	00/
SB	Through/Right	1,040	80	10	100	29	120	35	0%	0%
	Laft /Thomas	4 220	40						40/	00/
WB	Left/Through Right Turn	1,220 40	40 60	10 3	60 60	18 12	60 60	14 16	1% 20%	0% 0%
VVD										

#### Intersection 2

### American Canyon Rd/I-80 EB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qւ	ueue (ft)	Maximum	Queue (ft)	Block	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
	Shared	1,020	40	8	60	15	80	11	0%	0%
ЕВ										
	Through/Right	60	60	5	80	10	80	13	0%	22%
NB										
SB	Left/Through	440	60	6	80	8	80	10	0%	0%

I-80 Hiddenbrooke Interchange TOAR
Existing Conditions
AM Peak Hour

Intersection 3

#### Hiddenbrooke Parkway/McGary Rd

Side-street Stop

		Storage	Average (	Queue (ft)	95th Qı	ueue (ft)	Maximum	Queue (ft)	Block	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Shared	1,020	20	3	20	13	20	14	0%	0%
	Chand	000	460		260	446	240	447	00/	00/
NB	Shared	900	160	62	260	116	240	117	0%	0%
SB	Shared	60	20	1	20	7	20	9	0%	0%
36										
	Shared	620	20	7	60	11	60	16	0%	0%
WB										

Hiddenbrooke Interchange
Existing Conditions
PM Peak Hour

### Intersection 1

## American Canyon Rd/I-80 WB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn	137	125	91.6%	8.3	0.6	Α
NB	Through	90	89	99.3%	9.2	0.7	Α
ND	Right Turn						
	Subtotal	227	215	94.6%	8.7	0.6	Α
	Left Turn						_
SB	Through	383	372	97.1%	10.5	1.1	В
35	Right Turn	44	41	93.5%	5.8	1.6	Α
	Subtotal	427	413	96.8%	10.1	1.0	В
	Left Turn						
EB	Through						
LD	Right Turn						
	Subtotal						
	Left Turn	83	77	92.6%	8.7	2.3	Α
WB	Through	2	1	39.2%	2.0	4.2	Α
WB	Right Turn	327	310	94.7%	6.1	0.8	Α
	Subtotal	412	387	94.0%	6.6	1.1	Α
	Total	1,066	1,015	95.2%	8.5	0.8	Α

#### Intersection 2

## American Canyon Rd/I-80 EB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	151	145	95.8%	6.2	0.2	Α
ND	Right Turn	50	60	119.2%	3.9	0.3	Α
	Subtotal	201	204	101.6%	5.6	0.2	Α
	Left Turn	323	303	93.7%	10.6	0.9	В
SB	Through	143	143	99.8%	12.2	1.5	В
36	Right Turn						
	Subtotal	466	445	95.6%	11.1	1.1	В
	Left Turn	76	73	95.9%	8.3	1.4	Α
EB	Through	2	2	98.0%	4.5	6.2	Α
LD	Right Turn	270	258	95.4%	5.8	1.0	Α
	Subtotal	348	332	95.5%	6.4	1.0	Α
	Left Turn						
WB	Through						
WB	Right Turn						
	Subtotal						
	Total	1,015	982	96.7%	8.4	0.7	Α

Fehr & Peers 6/15/2020

Hiddenbrooke Interchange Existing Conditions PM Peak Hour

Intersection 3

## Hiddenbrooke Parkway/McGary Rd

**Side-street Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	186	189	101.4%	8.9	0.8	Α
IND	Right Turn	6	6	104.5%	3.4	3.3	Α
	Subtotal	192	195	101.5%	8.7	0.8	Α
	Left Turn	24	19	78.4%	0.7	0.3	Α
SB	Through	385	378	98.2%	1.2	0.1	Α
36	Right Turn	4	4	98.0%	0.6	0.5	Α
	Subtotal	413	401	97.0%	1.2	0.1	Α
	Left Turn	3	4	117.6%	3.4	4.0	Α
EB	Through						
LB	Right Turn						
	Subtotal	3	4	117.6%	3.4	4.0	Α
	Left Turn	6	5	84.9%	3.8	3.5	Α
WB	Through						
VVD	Right Turn	12	11	94.7%	3.7	2.8	Α
	Subtotal	18	16	91.5%	4.7	2.8	Α
	Total	626	615	98.3%	3.7	0.6	Α

Fehr & Peers 6/15/2020

Hiddenbrooke Interchange Existing Conditions PM Peak Hour

Intersection 1

#### American Canyon Rd/I-80 WB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qu	ueue (ft)	Maximum	Queue (ft)	Bloc	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
NB	Left/Through	440	60	5	80	12	80	11	0%	0%
	Through/Right	1,040	80	10	120	27	120	34	0%	0%
SB	Left/Through	1,220	60	13	100	32	100	40	7%	0%
WB	Right Turn	40	60	3	80	5	80	5	29%	0%

#### Intersection 2

### American Canyon Rd/I-80 EB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qւ	ueue (ft)	Maximum	Queue (ft)	Block	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
	Shared	1,020	60	10	100	20	100	23	0%	0%
EB										
	Through/Right	60	60	4	80	10	80	12	0%	9%
NB										
	Left/Through	440	80	12	120	29	140	35	0%	0%
SB										

Fehr & Peers 6/18/2020

Hiddenbrooke Interchange Existing Conditions PM Peak Hour

Intersection 3

#### Hiddenbrooke Parkway/McGary Rd

Side-street Stop

		Storage	Average	Queue (ft)	95th Qı	ueue (ft)	Maximum	Queue (ft)	Block	c Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
	Shared	1,020	20	4	20	14	20	15	0%	0%
EB										
	Shared	900	60	6	80	12	80	13	0%	0%
NB										
	Shared	60	20	2	20	11	20	15	0%	0%
SB										
	Shared	620	20	8	40	15	40	13	0%	0%
WB										

Fehr & Peers 6/18/2020

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (No Project)
AM Peak Hour

Intersection 1

## American Canyon Rd/I-80 WB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn	380	348	91.6%	10.8	0.8	В
NB	Through	140	144	103.1%	11.6	1.3	В
ND	Right Turn						
	Subtotal	520	492	94.7%	11.0	0.8	В
_	Left Turn						
SB	Through	390	401	102.7%	15.1	2.8	С
36	Right Turn	70	74	105.3%	10.8	3.8	В
	Subtotal	460	474	103.1%	14.4	2.9	В
	Left Turn						
EB	Through						
LB	Right Turn						
	Subtotal						
	Left Turn	30	27	89.9%	7.9	1.7	Α
WB	Through	10	12	121.6%	13.0	2.3	В
WD	Right Turn	250	267	106.7%	5.7	0.9	Α
	Subtotal	290	306	105.5%	6.2	0.9	Α
	Total	1,270	1,273	100.2%	11.1	1.3	В

#### Intersection 2

## American Canyon Rd/I-80 EB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	420	384	91.5%	7.4	0.4	Α
IND	Right Turn	100	86	86.3%	5.2	0.5	Α
	Subtotal	520	470	90.5%	7.0	0.4	Α
	Left Turn	350	354	101.2%	11.8	1.6	В
SB	Through	70	74	105.3%	12.5	1.6	В
36	Right Turn						
	Subtotal	420	428	101.9%	11.9	1.6	В
	Left Turn	100	110	110.2%	7.9	1.6	Α
EB	Through	10	12	121.6%	11.7	5.3	В
LD	Right Turn	100	109	108.7%	5.1	1.4	Α
	Subtotal	210	231	110.0%	6.8	1.7	Α
	Left Turn						
WB	Through						
VVD	Right Turn						
	Subtotal						
	Total	1,150	1,129	98.2%	8.8	1.0	Α

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (No Project)
AM Peak Hour

Intersection 3

## Hiddenbrooke Parkway/McGary Rd

**Side-street Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	480	432	90.0%	90.3	35.2	F
IND	Right Turn	10	14	144.4%	89.0	44.2	F
	Subtotal	490	447	91.1%	90.2	35.1	F
	Left Turn	10	7	72.2%	0.7	0.5	А
SB	Through	150	166	110.5%	1.2	0.2	Α
36	Right Turn	10	9	91.2%	0.5	0.3	Α
	Subtotal	170	182	107.1%	1.1	0.2	Α
	Left Turn	10	7	68.4%	4.4	1.9	Α
EB	Through						
LB	Right Turn						
	Subtotal	10	7	68.4%	4.4	1.9	Α
	Left Turn	10	10	95.0%	5.9	1.2	Α
WB	Through						
VVD	Right Turn	30	33	108.9%	3.7	0.7	Α
	Subtotal	40	42	105.5%	4.2	0.7	Α
	Total	710	678	95.4%	59.6	21.8	F

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (No Project) AM Peak Hour

Intersection 1

#### American Canyon Rd/I-80 WB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qu	ueue (ft)	Maximum	Queue (ft)	Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
NB	Left/Through	440	80	7	120	10	120	14	0%	0%
SB	Through/Right	1,040	120	23	180	53	180	55	0%	0%
30										
	Left/Through Right Turn	1,220 40	60 60	9 4	80 80	17 11	80 80	23 14	5% 27%	0% 0%
WB										

#### Intersection 2

### American Canyon Rd/I-80 EB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qu	ueue (ft)	Maximum	Queue (ft)	Block	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Shared	1,020	60	11	80	21	80	25	0%	0%
NB	Through/Right	60	80	3	80	7	100	8	0%	27%
SB	Left/Through	440	80	10	120	22	120	35	0%	0%

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (No Project) AM Peak Hour

Intersection 3

#### Hiddenbrooke Parkway/McGary Rd

Side-street Stop

		Storage	Average	Queue (ft)	95th Qւ	ieue (ft)	Maximum	Queue (ft)	Block	c Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Shared	1,020	20	4	40	12	40	12	0%	0%
	Chanad	200	140	455	600	450	550	420	00/	40/
NB	Shared	900	440	155	680	159	660	138	0%	1%
	Shared	60	20	3	20	14	20	19	0%	0%
SB										
N/P	Shared	620	40	2	60	11	60	17	0%	0%
WB										

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (No Project)
PM Peak Hour

Intersection 1

## American Canyon Rd/I-80 WB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn	170	161	94.5%	9.5	0.9	А
NB	Through	110	108	98.0%	10.3	0.9	В
IND	Right Turn						
	Subtotal	280	269	95.9%	9.8	0.8	Α
_	Left Turn						
SB	Through	450	447	99.4%	12.9	2.0	В
36	Right Turn	60	49	81.0%	8.4	1.9	Α
	Subtotal	510	496	97.2%	12.4	2.0	В
_	Left Turn						
EB	Through						
LB	Right Turn						
	Subtotal						
_	Left Turn	100	95	95.3%	9.6	1.8	Α
WB	Through	10	10	98.0%	10.6	4.1	В
VVD	Right Turn	360	358	99.3%	8.0	1.9	Α
	Subtotal	470	463	98.4%	8.4	1.7	Α
	Total	1,260	1,227	97.4%	10.4	1.4	В

### Intersection 2

## American Canyon Rd/I-80 EB Ramps

**All-way Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/vel	n)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	200	194	97.2%	6.6	0.3	Α
ND	Right Turn	60	64	107.1%	4.4	0.4	Α
	Subtotal	260	259	99.5%	6.1	0.3	Α
	Left Turn	370	359	97.2%	17.1	6.1	С
SB	Through	180	176	97.6%	18.6	5.5	С
36	Right Turn						
	Subtotal	550	535	97.3%	17.6	5.8	С
	Left Turn	80	78	97.5%	10.5	1.3	В
EB	Through	10	7	74.5%	11.3	6.6	В
LD	Right Turn	320	309	96.7%	8.9	3.1	Α
	Subtotal	410	395	96.3%	9.3	2.5	Α
	Left Turn						
WB	Through						
WB	Right Turn						
	Subtotal						
	Total	1,220	1,189	97.4%	12.3	3.2	В

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (No Project)
PM Peak Hour

Intersection 3

## Hiddenbrooke Parkway/McGary Rd

**Side-street Stop** 

	1	Demand	Served Vo	lume (vph)	Total	Delay (sec/vel	n)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	230	233	101.2%	11.2	2.1	В
IND	Right Turn	10	9	90.2%	5.8	7.8	Α
	Subtotal	240	242	100.8%	11.0	2.0	В
	Left Turn	30	40	132.0%	0.9	0.2	Α
SB	Through	460	435	94.5%	1.3	0.1	Α
36	Right Turn	10	9	90.2%	0.8	0.3	Α
	Subtotal	500	483	96.7%	1.2	0.1	Α
	Left Turn	10	6	62.7%	5.7	4.6	Α
EB	Through						
LD	Right Turn						
	Subtotal	10	6	62.7%	5.7	4.6	Α
	Left Turn	10	7	66.6%	4.5	2.6	Α
WB	Through						
WB	Right Turn	20	18	92.1%	6.5	3.1	Α
	Subtotal	30	25	83.6%	6.2	2.1	Α
	Total	780	757	97.0%	4.6	1.0	Α

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (No Project) PM Peak Hour

Intersection 1

American Canyon Rd/I-80 WB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qı	ueue (ft)	Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
NB	Left/Through	440	60	8	80	14	80	12	0%	0%
	Through/Right	1,040	100	15	160	41	180	51	0%	0%
SB	to fl (Thursday	4 222	00		120		140	70	440/	00/
WB	Left/Through Right Turn	1,220 40	80 60	13 3	120 60	56 6	140 60	78 9	11% 37%	0% 0%

### Intersection 2 American Canyon Rd/I-80 EB Ramps

All-way Stop

		Storage	Average	Queue (ft)	95th Qu	ueue (ft)	Maximum	Queue (ft)	Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Shared	1,020	80	18	140	47	140	39	0%	0%
NB	Through/Right	60	60	3	80	5	80	7	0%	12%
SB	Left/Through	440	140	43	220	80	220	98	0%	0%

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (No Project) PM Peak Hour

Intersection 3

#### Hiddenbrooke Parkway/McGary Rd

Side-street Stop

		Storage	Average	Queue (ft)	95th Qu	ieue (ft)	Maximum	Queue (ft)	Block	c Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Shared	1,020	20	6	20	14	20	14	0%	0%
NB	Shared	900	80	10	120	23	120	30	0%	0%
IND										
	Shared	60	20	5	20	21	40	25	0%	0%
SB										
14/15	Shared	620	20	5	60	6	40	9	0%	0%
WB										

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (Signalized)
AM Peak Hour

Intersection 1

## American Canyon Rd/I-80 WB Ramps

Signal

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn	380	364	95.7%	30.0	2.7	С
NB	Through	140	145	103.4%	11.0	2.8	В
ND	Right Turn						
	Subtotal	520	508	97.8%	24.5	2.6	С
	Left Turn						
SB	Through	390	376	96.5%	33.6	2.7	С
36	Right Turn	70	66	93.9%	7.9	2.0	Α
	Subtotal	460	442	96.1%	29.8	2.7	С
	Left Turn						
EB	Through						
LB	Right Turn						
	Subtotal						
	Left Turn	30	29	97.5%	39.6	9.2	D
WB	Through	10	9	91.2%	42.2	18.1	D
WB	Right Turn	250	258	103.1%	6.8	1.2	Α
	Subtotal	290	296	102.1%	11.0	1.6	В
	Total	1,270	1,246	98.1%	23.2	1.5	С

### Intersection 2

## American Canyon Rd/I-80 EB Ramps

Signal

		Demand	Served Vo	lume (vph)	Total	Delay (sec/vel	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	420	412	98.0%	6.5	0.5	Α
IND	Right Turn	100	92	91.6%	4.7	1.1	Α
	Subtotal	520	503	96.8%	6.2	0.6	Α
	Left Turn	350	337	96.3%	6.0	0.7	Α
SB	Through	70	69	98.3%	12.1	8.9	В
36	Right Turn						
	Subtotal	420	406	96.6%	6.9	1.7	Α
	Left Turn	100	96	96.1%	37.6	5.3	D
EB	Through	10	10	95.0%	47.9	17.4	D
LB	Right Turn	100	92	92.0%	5.9	2.0	Α
	Subtotal	210	198	94.1%	23.2	2.8	С
	Left Turn						
WB	Through						
WB	Right Turn						
	Subtotal						
	Total	1,150	1,107	96.2%	9.5	1.0	Α

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (Signalized)
AM Peak Hour

Intersection 3

## Hiddenbrooke Parkway/McGary Rd

**Side-street Stop** 

	1	Demand	Served Vo	lume (vph)	Total	Delay (sec/vel	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	480	463	96.5%	15.2	2.2	С
IND	Right Turn	10	9	87.4%	0.3	0.1	Α
	Subtotal	490	472	96.3%	15.0	2.3	В
	Left Turn	10	10	102.6%	3.5	5.6	Α
SB	Through	150	141	94.2%	0.7	0.1	Α
36	Right Turn	10	8	76.0%	0.2	0.2	Α
	Subtotal	170	159	93.7%	0.9	0.3	Α
	Left Turn	10	10	98.8%	10.4	9.9	В
ЕВ	Through						
LB	Right Turn						
	Subtotal	10	10	98.8%	10.4	9.9	В
	Left Turn	10	10	98.8%	8.3	4.0	Α
WB	Through						
VVD	Right Turn	30	29	95.0%	7.1	5.3	Α
	Subtotal	40	38	96.0%	7.4	4.0	Α
	Total	710	679	95.7%	11.2	1.9	В

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (Signalized) AM Peak Hour

Intersection 1

American Canyon Rd/I-80 WB Ramps

Signal

		Storage	Average	Queue (ft)	95th Qı	ueue (ft)	Maximum	Queue (ft)	Block	k Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
	Left/Through	440	220	20	320	25	300	26	0%	0%
NB										
	Through	1,040	220	29	340	43	360	54	3%	0%
	Right Turn	320	40	23	120	97	140	135	0%	0%
SB										
	Left/Through	1,220	40	8	80	17	80	19	0%	0%
WB	Right Turn	220	60	12	100	31	100	45	0%	0%

#### Intersection 2

### American Canyon Rd/I-80 EB Ramps

Signal

		Storage	Average (	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream	
	Left/Through	1,020	80	12	140	26	140	28	0%	0%	
	Right Turn	320	40	6	60	13	60	14	0%	0%	
EB											
	Th	40		4			00	44	00/	450/	
	Through	40	60	4	80	9	80	11	0%	45%	
	Right Turn	40	40	4	40	8	40	15	0%	12%	
NB											
	Left/Through	440	20	14	40	43	60	53	0%	0%	
C.D.											
SB											

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (Signalized) AM Peak Hour

Intersection 3

#### Hiddenbrooke Parkway/McGary Rd

Side-street Stop

		Storage	Average	Queue (ft)	95th Qı	ueue (ft)	Maximum	Queue (ft)	Block	c Time
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
	Shared	1,020	20	4	40	11	40	12	0%	0%
ЕВ										
	Left/Through	900	160	29	260	39	260	30	0%	0%
	Through/Right	900	20	7	40	17	60	19	0%	0%
NB										
SB	Shared	40	20	4	20	15	20	16	0%	1%
	Shared	620	40	5	60	5	60	11	0%	0%
WB										

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (Signalized)
PM Peak Hour

Intersection 1

## American Canyon Rd/I-80 WB Ramps

Signal

	1	Demand	Served Vo	lume (vph)	Total Delay (sec/veh)			
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS	
	Left Turn	170	156	91.8%	34.8	3.7	С	
NB	Through	110	114	104.1%	13.4	3.8	В	
IND	Right Turn							
	Subtotal	280	270	96.6%	25.7	3.1	С	
	Left Turn							
SB	Through	450	426	94.6%	40.5	15.9	D	
36	Right Turn	60	59	98.7%	7.7	6.8	Α	
	Subtotal	510	485	95.1%	36.6	15.6	D	
	Left Turn							
ЕВ	Through							
LD	Right Turn							
	Subtotal							
	Left Turn	100	103	103.1%	35.4	4.7	D	
WB	Through	10	7	70.6%	30.9	21.9	С	
VVD	Right Turn	360	372	103.3%	9.0	1.5	Α	
	Subtotal	470	482	102.6%	15.1	1.2	В	
	Total	1,260	1,238	98.2%	25.8	6.1	С	

### Intersection 2

## American Canyon Rd/I-80 EB Ramps

Signal

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	200	193	96.4%	9.3	1.2	Α
ND	Right Turn	60	62	102.6%	5.6	1.8	Α
	Subtotal	260	254	97.8%	8.4	1.1	Α
	Left Turn	370	342	92.4%	14.1	5.0	В
SB	Through	180	181	100.4%	23.5	7.8	С
36	Right Turn						
	Subtotal	550	523	95.0%	17.3	5.9	В
	Left Turn	80	80	99.5%	32.3	5.5	С
EB	Through	10	12	117.6%	29.7	18.8	С
LB	Right Turn	320	324	101.2%	9.5	2.3	Α
	Subtotal	410	415	101.3%	14.6	2.8	В
	Left Turn						
WB	Through						
WB	Right Turn						
	Subtotal						
	Total	1,220	1,192	97.7%	14.4	2.8	В

I-80 Hiddenbrooke Interchange TOAR
Opening Year 2024 (Signalized)
PM Peak Hour

Intersection 3

## Hiddenbrooke Parkway/McGary Rd

**Side-street Stop** 

		Demand	Served Vo	lume (vph)	Total	Delay (sec/ve	h)
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
	Left Turn						
NB	Through	230	226	98.2%	10.3	2.7	В
ND	Right Turn	10	11	113.7%	0.3	0.3	Α
	Subtotal	240	237	98.8%	9.8	2.6	Α
	Left Turn	30	32	107.1%	1.5	1.0	Α
SB	Through	460	464	100.8%	0.9	0.1	Α
36	Right Turn	10	10	101.9%	0.3	0.3	Α
	Subtotal	500	506	101.2%	0.9	0.1	Α
	Left Turn	10	7	66.6%	5.6	3.6	Α
ЕВ	Through						
LB	Right Turn						
	Subtotal	10	7	66.6%	5.6	3.6	Α
	Left Turn	10	9	90.2%	8.6	5.5	Α
WB	Through						
VVD	Right Turn	20	21	105.8%	3.3	1.0	Α
	Subtotal	30	30	100.6%	5.1	2.0	Α
	Total	780	780	100.0%	3.8	0.8	Α

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (Signalized) PM Peak Hour

Intersection 1

American Canyon Rd/I-80 WB Ramps

Signal

	Storage	Average	Queue (ft)	95th Qı	ueue (ft)	Maximum	Queue (ft)	Bloc	k Time
Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
Left/Through	440	140	17	220	44	200	34	0%	0%
-									0%
Right Turn	320	40	29	120	115	140	140	0%	0%
Left/Through	1,220	80	11	140	37	140	43	0%	0%
Right Turn	220	80	15	140	38	140	52	0%	0%
	Left/Through Through Right Turn  Left/Through	Lane Group         (ft)           Left/Through         440           Through         1,040           Right Turn         320           Left/Through         1,220	Lane Group         (ft)         Average           Left/Through         440         140           Through         1,040         280           Right Turn         320         40	Lane Group         (ft)         Average         Std. Dev.           Left/Through         440         140         17           Through Right Turn         1,040         280         86           Right Turn         320         40         29	Lane Group         (ft)         Average         Std. Dev.         Average           Left/Through         440         140         17         220           Through Right Turn         1,040         280         86         360           Right Turn         320         40         29         120           Left/Through         1,220         80         11         140	Lane Group         (ft)         Average         Std. Dev.         Average         Std. Dev.           Left/Through         440         140         17         220         44           Through Right Turn         1,040         280         86         360         122           Right Turn         320         40         29         120         115           Left/Through         1,220         80         11         140         37	Lane Group         (ft)         Average         Std. Dev.         Average         Std. Dev.         Average           Left/Through         440         140         17         220         44         200           Through Right Turn         1,040         280         86         360         122         360           Right Turn         320         40         29         120         115         140           Left/Through         1,220         80         11         140         37         140	Lane Group         (ft)         Average         Std. Dev.         <	Lane Group         (ft)         Average         Std. Dev.         Average         Std. Dev.         Average         Std. Dev.         Pocket           Left/Through         440         140         17         220         44         200         34         0%           Through Right Turn         1,040         280         86         360         122         360         140         7%           Right Turn         320         40         29         120         115         140         140         0%           Left/Through         1,220         80         11         140         37         140         43         0%

#### Intersection 2

### American Canyon Rd/I-80 EB Ramps

Signal

		Storage	Average (	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream	
	Left/Through	1,020	60	14	100	16	100	16	0%	0%	
	Right Turn	320	80	19	140	49	160	59	0%	0%	
EB											
	Through	40	40	3	60	10	60	11	0%	38%	
	Right Turn	40	40	6	60	11	40	15	0%	10%	
	MgHt ruin	40	40	O	00		40	13	070	10/0	
NB											
	Left/Through	440	160	53	280	112	300	90	0%	0%	
SB											

I-80 Hiddenbrooke Interchange TOAR Opening Year 2024 (Signalized) PM Peak Hour

Intersection 3

#### Hiddenbrooke Parkway/McGary Rd

Side-street Stop

		Storage	Average	Queue (ft)	95th Qւ	ueue (ft)	Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
	Shared	1,020	20	4	40	12	40	12	0%	0%
EB										
	Left/Through	900	80	15	140	26	120	26	0%	0%
	Through/Right	900	20	5	40	17	40	20	0%	0%
NB										
	Shared	40	20	6	40	15	40	15	0%	1%
SB										
	Shared	620	40	5	60	6	40	7	0%	0%
WB										