APPENDIX B

TRAFFIC

Appendix B - Traffic

B.1 Introduction

Included in this appendix are the details of the data collection and methodology for the traffic analysis used to evaluate the SR 85 improvement alternatives. Also provided is a comparison of the traffic operations performance results terms of vehicle miles of travel and miles of congestion, as well as other performance measures.

The traffic analysis was limited to the SR 85 freeway mainline and spanned the length of SR 85 corridor study area, SR 85 between SR 87 in the south and US 101 in the north. The traffic analysis was conducted for a 6-hour AM peak period (6 am to 12 pm) and a 6-hour PM peak period (2 pm to 8 pm) with volume and speed data collected between 6 am and 8 pm.

This Appendix is organized into the following six sections:

1. Introduction to the traffic analysis
2. Traffic volume data collection/processing for Alternative 1-1 No Change
3. Traffic speed data collection/processing for no change alternative
4. A spreadsheet-based sketch planning traffic operations model to estimate changes in volumes and speeds under the following build alternatives:
    - 2-1 HOV to Express Lane Conversion
    - 2-2 Short Dual Express Lane
    - 2-3 Long Dual Express Lane
    - 3-1 Short Median Transit Lane
    - 3-2 Long Median Transit Lane alternative
    - 3-3 Right Side Median Transit Lane alternative
    - 4-1 Median Bus on Shoulder alternative
    - 4-4 Right Side Bus on Shoulder alternative
5. McTrans' Highway Capacity Software Version 7 (HCS7) based special case analysis of proposed El Camino Real interchange reconfiguration from a cloverleaf to a diamond (included in all build alternatives).
6. Comparison of traffic operations performance results

Santa Clara Valley Transportation Authority (VTA) and City/County Association of Governments (C/CAG) of San Mateo County Regional Travel Demand Model was not available to use in this traffic analysis.

B.2 Traffic Volume Data Collection/Processing

B.2.1 Field Traffic Counts and Surveys

Traffic counts and surveys on the mainline and ramps along SR 85 were collected as follows:

- **Traffic and vehicle classification counts on SR 85 mainline segments** were conducted using a video data collection method from four (4) freeway overpass locations as shown in **Figure B-1**. The traffic count data was collected in both directions of traffic for 14 hours (6 am to 8 pm), in15-minute interval in February 2020. Vehicle classes included: auto, bus and truck. The counts were also separated into general purpose or GP lanes and high occupancy vehicle or HOV lanes.

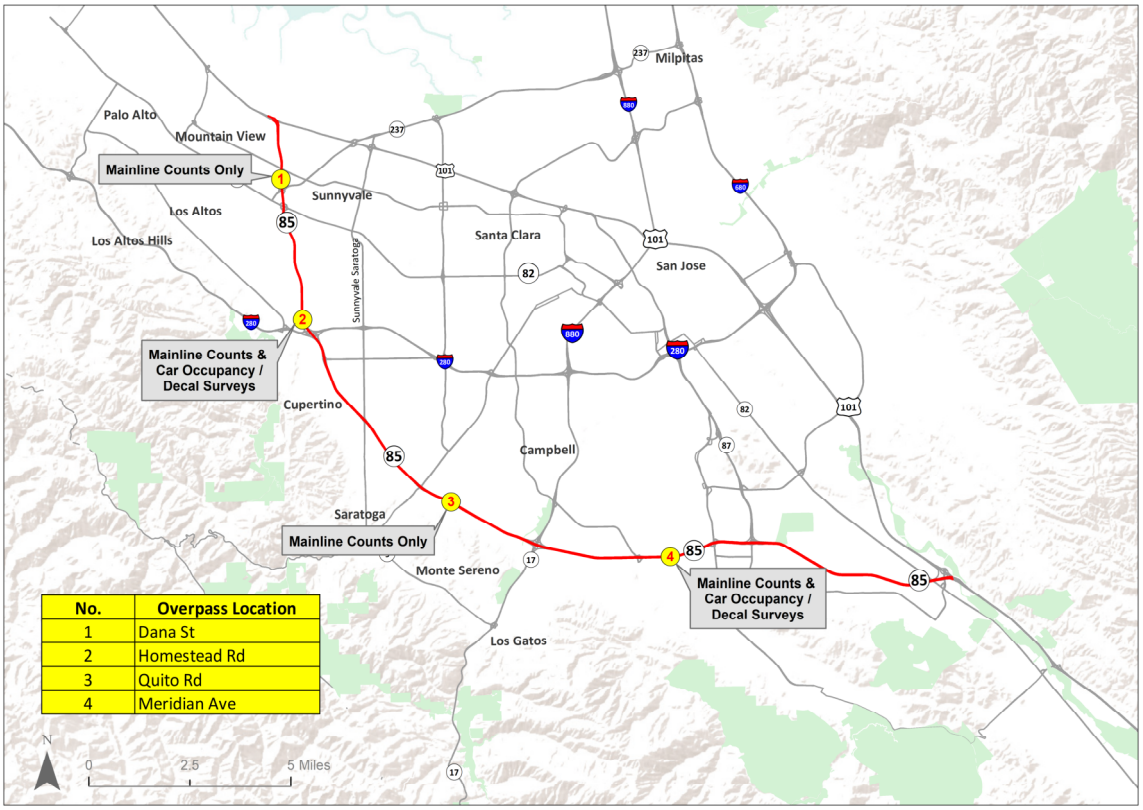
- **Occupancy and clean air vehicle decal (CAV decal) surveys on high occupancy vehicle (HOV) lanes only** were conducted at two (2) out of these four (4) freeway overpass locations, as identified in **Figure B-1**. The survey data were collected on high occupancy vehicle (HOV) lanes only in both directions of traffic for 2 morning hours (7 am to 9 am) and 2 evening hours (4 pm to 6 pm), by 15-minute interval in February 2020.

- **Traffic and vehicle classification counts on SR 85 ramps** were conducted using pneumatic tube data collection at fifty (50) ramps spread over thirteen (13) interchange locations as shown in **Figure B-2**. This excludes all freeway-to-freeway interchange ramps, the volumes for which were estimated using an alternate data source and method as explained in **Section B.2.2**. These counts were also collected in both directions of traffic for 14 hours (6 am to 8 pm), in 15-minute intervals in February 2020. Vehicle classes included: auto, bus and truck.

Due to a large number of locations, the counts and surveys were conducted over multiple midweek days (Tuesday to Thursday) in February 2020[1] as summarized in **Tables B-1** and **B-2**.

[1] Prior to the advent of California and SF Bay Area coronavirus / COVID-19 stay home orders of 2020.

Figure B-1 Locations of SR 85 Mainline Counts and Surveys Data Collection



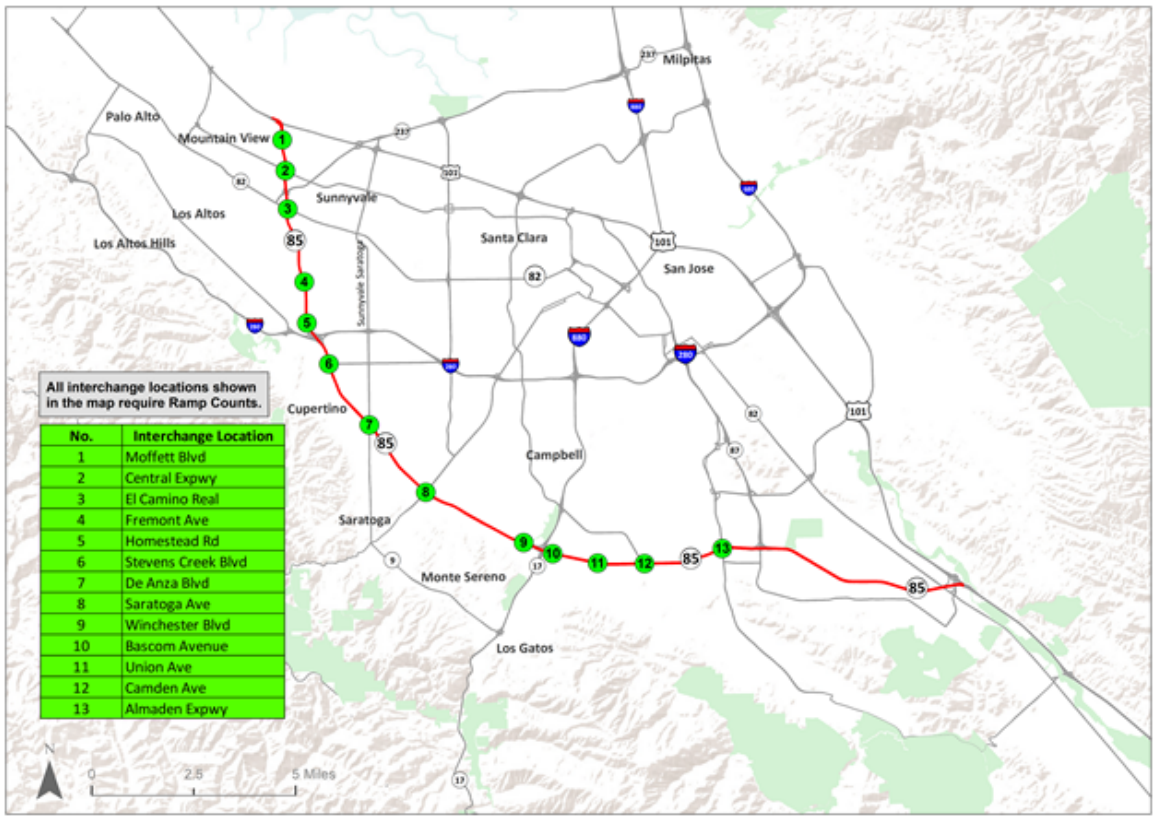
Source: SR 85 Transit Guideway Study Task 1 Report Basemap; CDM Smith.

Table B-1 Dates of SR 85 Mainline Counts and Surveys Data Collection

Map ID	Location ID	Count Location	Type	Data Collection Method	Date (Day of the Week)	Times
Fig. B-1 #1	ML-3	SR 85 at Dana Street	Traffic Counts & Vehicle Classification	Video	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-1 #2	ML-1	SR 85 at Homestead Road	Traffic Counts & Vehicle Classification	Video	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-1 #3	ML-4	SR 85 at Quito Road	Traffic Counts & Vehicle Classification	Video	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-1 #4	ML-2	SR 85 at Meridian Avenue	Traffic Counts & Vehicle Classification	Video	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-1 #2	ML-1	SR 85 at Homestead Road	HOV Lane Occupancy Counts	Manual	2/5/2020 (Wed)	7 AM - 9 AM 4 PM - 6 PM
Fig. B-1 #4	ML-2	SR 85 at Meridian Avenue	HOV Lane Occupancy Counts	Manual	2/11/2020 (Tue)	7 AM - 9 AM 4 PM - 6 PM
Fig. B-1 #2	ML-1	SR 85 at Homestead Road	Clean Air Vehicle Decal Counts	Manual	2/13/2020 (Thu)	7 AM - 9 AM 4 PM - 6 PM
Fig. B-1 #4	ML-2	SR 85 at Meridian Avenue	Clean Air Vehicle Decal Counts	Manual	2/11/2020 (Tue)	7 AM - 9 AM 4 PM - 6 PM

Source: Quality Counts, a subcontractor to CDM Smith.

Figure B-2 Locations of SR 85 Interchanges (Ramps) Counts Data Collection



Source: SR 85 Transit Guideway Study Task 1 Report Basemap; CDM Smith.

Table B-2 Dates of SR 85 Ramp Counts Data Collection

Map ID	Location ID	Count Location	Type	Data Collection Method	Date	Times
Fig. B-2 #1	RM-1	SR 85 SB On Ramp from Moffett Blvd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #1	RM-2	SR 85 NB Off Ramp to Moffett Blvd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #2	RM-3	SR 85 SB Off Ramp to Central Expy	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #2	RM-4	SR 85 SB On Ramp from Central Expy	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #2	RM-5	SR 85 NB On Ramp from Central Expy	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #2	RM-6	SR 85 NB Off Ramp to Central Expy	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #3	RM-7	SR 85 SB On Ramp from WB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #3	RM-8	SR 85 NB Off Ramp to WB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #3	RM-9	SR 85 NB On Ramp from WB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #3	RM-10	SR 85 NB Off Ramp to EB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #3	RM-11	SR 85 NB On Ramp from EB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM

Map ID	Location ID	Count Location	Type	Data Collection Method	Date	Times
Fig. B-2 #3	RM-12	SR 85 SB Off Ramp to EB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #3	RM-13	SR 85 SB On Ramp from EB El Camino Real	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #4	RM-14	SR 85 SB Off Ramp to W Fremont Ave	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #4	RM-15	SR 85 NB Off Ramp to W Fremont Ave	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #4	RM-16	SR 85 SB On Ramp from W Fremont Ave	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #4	RM-17	SR 85 NB On Ramp from W Fremont Ave	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #5	RM-18	SR 85 SB Off Ramp to Homestead Rd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #5	RM-19	SR 85 NB On Ramp from Homestead Rd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #6	RM-20	SR 85 SB Off Ramp to Stevens Creek Blvd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #6	RM-21	SR 85 NB Off Ramp to Stevens Creek Blvd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #6	RM-22	SR 85 SB On Ramp from Stevens Creek Blvd	Traffic Counts & Vehicle Classification	Tube	2/4/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #7	RM-23	SR 85 NB On Ramp from S De Anza Blvd	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #7	RM-24	SR 85 SB On Ramp from S De Anza Blvd	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #7	RM-25	SR 85 NB Off Ramp to S De Anza Blvd	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #7	RM-26	SR 85 SB Off Ramp to S De Anza Blvd	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #8	RM-27	SR 85 NB On Ramp from Saratoga Ave	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #8	RM-28	SR 85 SB On Ramp from Saratoga Ave	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #8	RM-29	SR 85 SB Off Ramp to Saratoga Ave	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #8	RM-30	SR 85 NB Off Ramp to Saratoga Ave	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #9	RM-31	SR 85 NB On Ramp from Winchester Blvd	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #9	RM-32	SR 85 SB Off Ramp to Winchester Blvd	Traffic Counts & Vehicle Classification	Tube	2/6/2020 (Thu)	6 AM - 8 PM
Fig. B-2 #10	RM-33	SR 85 NB On Ramp from S Bascom Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #10	RM-34	SR 85 SB On Ramp from S Bascom Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #10	RM-35	SR 85 NB Off Ramp to S Bascom Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #10	RM-36	SR 85 SB Off Ramp to S Bascom Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #11	RM-37	SR 85 NB Off Ramp to Union Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #11	RM-38	SR 85 SB Off Ramp to Union Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM

Map ID	Location ID	Count Location	Type	Data Collection Method	Date	Times
Fig. B-2 #11	RM-39	SR 85 NB On Ramp from Union Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #11	RM-40	SR 85 SB On Ramp from Union Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #12	RM-41	SR 85 NB On Ramp from Camden Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #12	RM-42	SR 85 SB On Ramp from Camden Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #12	RM-43	SR 85 SB Off Ramp to Camden Ave	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #12	RM-44	SR 85 NB Off Ramp to Branham Ln	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #13	RM-45	SR 85 NB On Ramp from SB Almaden Expy	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #13	RM-46	SR 85 NB On Ramp from NB Almaden Expy	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #13	RM-47	SR 85 NB Off Ramp to Almaden Expy	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #13	RM-48	SR 85 SB Off Ramp to Almaden Plaza Way	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #13	RM-49	SR 85 SB On Ramp from SB Almaden Expy	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM
Fig. B-2 #13	RM-50	SR 85 SB On Ramp from Almaden Expy	Traffic Counts & Vehicle Classification	Tube	2/11/2020 (Tue)	6 AM - 8 PM

Source: Quality Counts, a sub consultant to CDM Smith

B.2.2 Other Traffic Counts

Other sources of traffic counts were used to compare and adjust the field traffic counts collected in February 2020 (see **Section B.2.1**) when needed. Other sources were also used to estimate traffic volumes on the ramps that are freeway-to-freeway interchanges, which were not collected in the field but were required to produce balanced flow volumes[2] for the SR 85 corridor.

B.2.2.1 Caltrans Traffic Census Counts

Seven-day (7-day) hourly Caltrans traffic census counts dated November 2015 were collected for SR 85 at Dana Street overcrossing. The midweek day average count volume was estimated using the 7-day counts for comparison to the field mainline counts collected in February 2020.

B.2.2.2 Caltrans Performance Measurement System (PeMS) Counts

Hourly counts averaged over the midweek days in February 2020[3] were collected from the Caltrans Performance Measurement System (PeMS) data portal for comparison to the field mainline counts collected in February 2020.

[2] "Balanced" flow volumes refer to a situation where the total inflow volumes to SR 85 corridor (via start of mainline or on-ramps) equals the total outflow volumes from SR 85 corridor (via end of mainline or off-ramps).

[3] In the week of February 4 (Tuesday) to February 6 (Thursday) of the year 2020, which matches with one of the weeks for the field data collection.

B.2.2.3 SR 85 Transit Guideway Study Phase 1 Report Balanced Volumes

From the Phase 1 Report of this Study, hourly balanced flow volume estimates dated April 2019 were available for the SR 85 corridor. These were developed by a consultant to VTA (Parsons) using an older field data collection effort. These volume estimates were used to compare with the field mainline counts collected in February 2020 and to derive estimates of traffic volumes on the ramps with freeway-to-freeway interchanges that fall within the traffic analysis limits of the SR 85 corridor. These include, from north to south: SR 85 at SR 237 (4 ramps in total for both directions); SR 85 at I-280 (6 ramps in total for both directions); and, SR 85 at 17 (4 ramps total for both directions).

B.2.3 Traffic Counts Data Processing

As noted previously, given the large number of locations, the counts and surveys were conducted over multiple midweek days in February 2020. There was no repetition of any count site. These counts are subject to day-to-day variations but have been combined for modeling traffic operations. There has been on a steady increase in the annual average employment in Santa Clara County since 2009, increasing from 782,400 in 2009 to 1,027,500 in 2019[4]. Steady growth in vehicular traffic volumes on the SR 85 corridor are expected. For these reasons, adjustments were performed on the traffic counts.

Disclaimer: Note that the traffic volume estimates made in this traffic analysis are based on the travel conditions prior to the advent of California and SF Bay Area coronavirus / COVID-19 stay home orders of 2020.

B.2.3.1 SR 85 Mainline Traffic Adjustments

Peak directional traffic counts taken at four mainline sites in February 2020 were compared to the peak directional average traffic volumes at the same sites computed from the three other sources including Caltrans Traffic Census Counts, Caltrans PeMS Counts and SR 85 Transit Guideway Study Phase 1 Report Balanced Volumes. The comparisons were made for the total counts over the following peak directions of traffic flow: Northbound AM (morning) peak period of 6 am to 12 pm and Southbound PM (evening) peak period of 2 pm to 8 pm. For each mainline site, if the average of the comparable data was higher than the February 2020 traffic count then the count was adjusted to the average of the comparable data, if not the count was used without any adjustment. The calculatedf mainline adjustment factors were applied to the 15-minute interval mainline counts to estimate unbalanced 15-minute interval mainline volumes. **Table B-3** shows the comparison of traffic volumes on the mainline count locations and estimated adjustment factors by peak direction.

Figures B-3 through **B-10** show a comparison of the raw 15-minute interval counts and unbalanced 15-minute interval volumes after application of the adjustment factors.

[4] California Employment Development Department, Historical Data for Unemployment Rate and Labor Force (Not Seasonally Adjusted) in Santa Clara County, Available at: https://www.labormarketinfo.edd.ca.gov/ (last accessed on May 11, 2020)

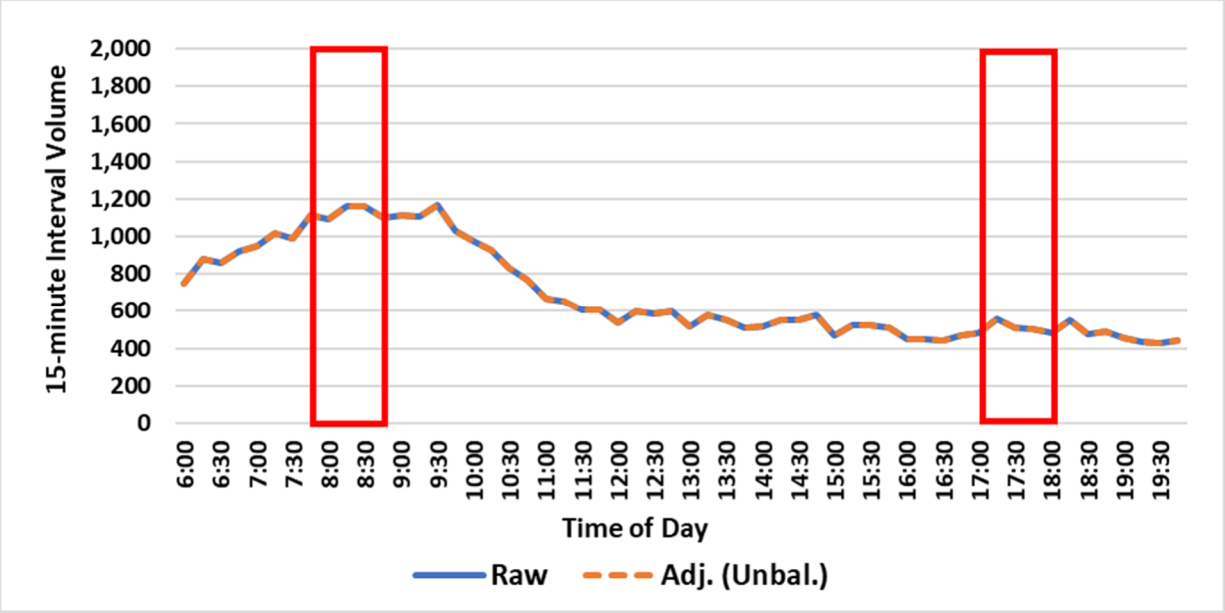
Table B-3 Comparisons of February 2020 SR 85 Mainline Counts with Volumes from Other Sources by Peak Direction of Travel

Map ID	Location ID	Count Location	Dir.	Time Period	Feb 2020 Traffic Count	Comp. Data #1 - Census Traffic Count	Comp. Data #2 -PeMS Traffic Count	Comp. Data #3 – Ph. 1 Report Traffic Volume	Avg. of Comp. Data – Traffic Volume	Adjustment Factor
Fig. B-1 #1	ML-3	SR 85 at Dana Street	NB	AM	**22,451**	21,875	23,404	21,106	**22,129**	**1.00**
			SB	PM	**19,801**	20,052	21,275	21,888	**21,072**	**1.06**
Fig. B-1 #2	ML-1	SR 85 at Homestead Road	NB	AM	**27,619**	N.A.	31,522	29,065	**30,293**	**1.10**
			SB	PM	**29,198**	N.A.	30,820	29,086	**29,953**	**1.03**
Fig. B-1 #3	ML-4	SR 85 at Quito Road	NB	AM	**30,022**	N.A.	30,663	21,688	**26,176**	**1.00**
			SB	PM	**30,047**	N.A.	28,248	27,556	**27,902**	**1.00**
Fig. B-1 #4	ML-2	SR 85 at Meridian Avenue	NB	AM	**26,558**	N.A.	26,938	16,726	**21,832**	**1.00**
			SB	PM	**30,312**	N.A.	29,264	29,425	**29,344**	**1.00**

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Comp. = Comparable, Ph. = Phase, NB = Northbound, SB = Southbound, AM Period = 6 am to 12 pm, PM Period = 2 pm to 8 pm.

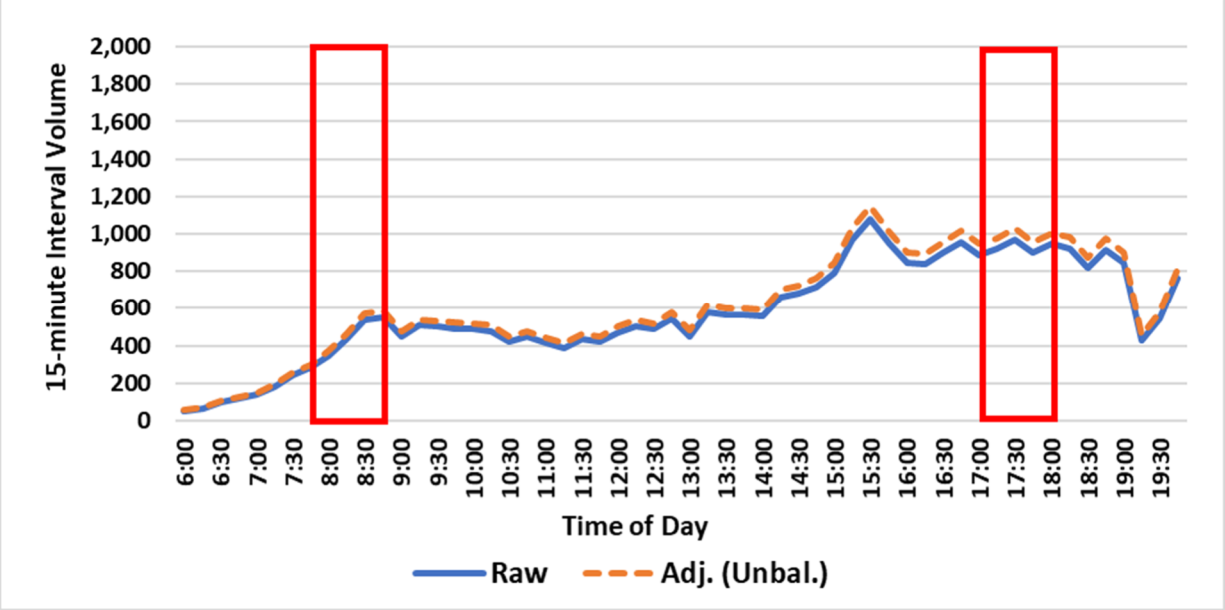
Figure B-3 SR 85 at Dana Street Northbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

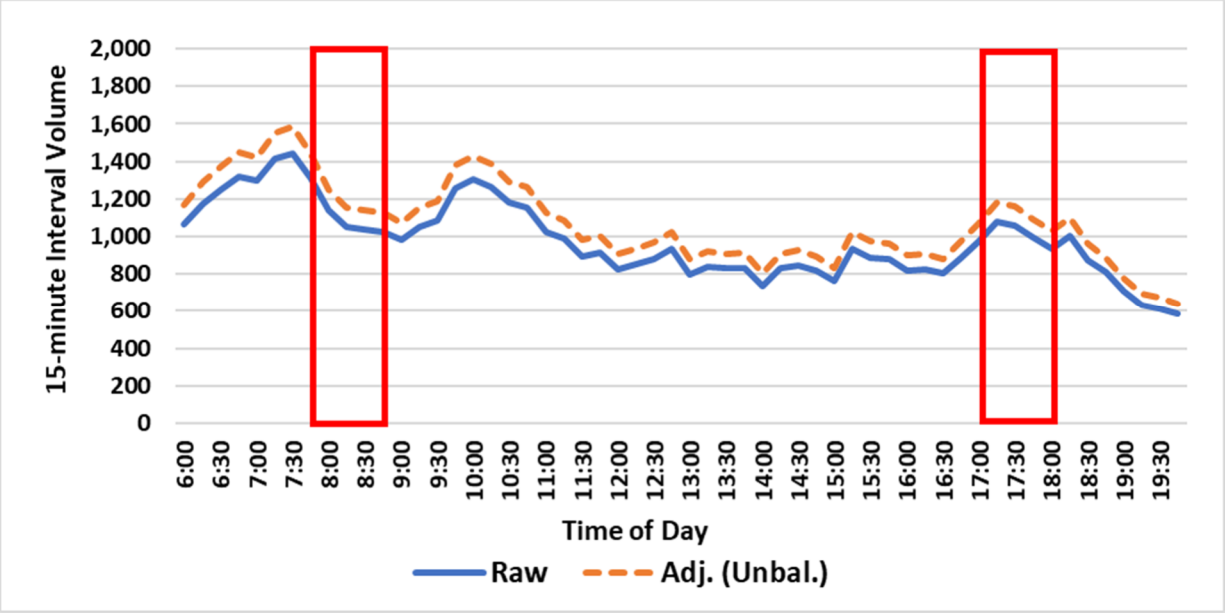
Figure B-4 SR 85 at Dana Street Southbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

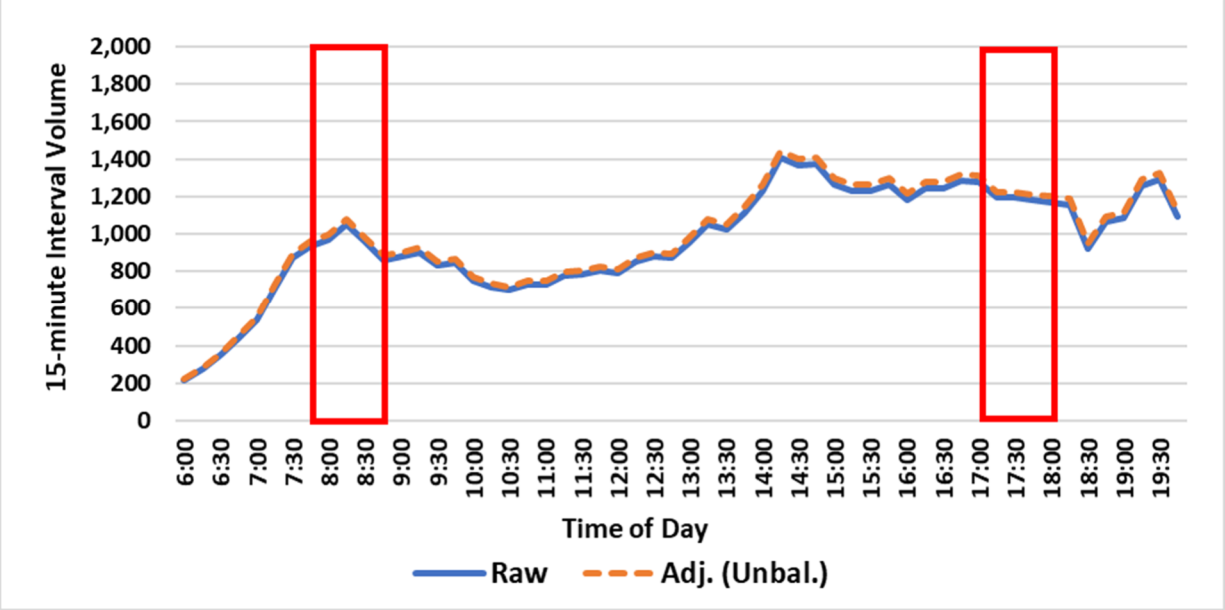
Figure B-5 SR 85 at Homestead Road Northbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

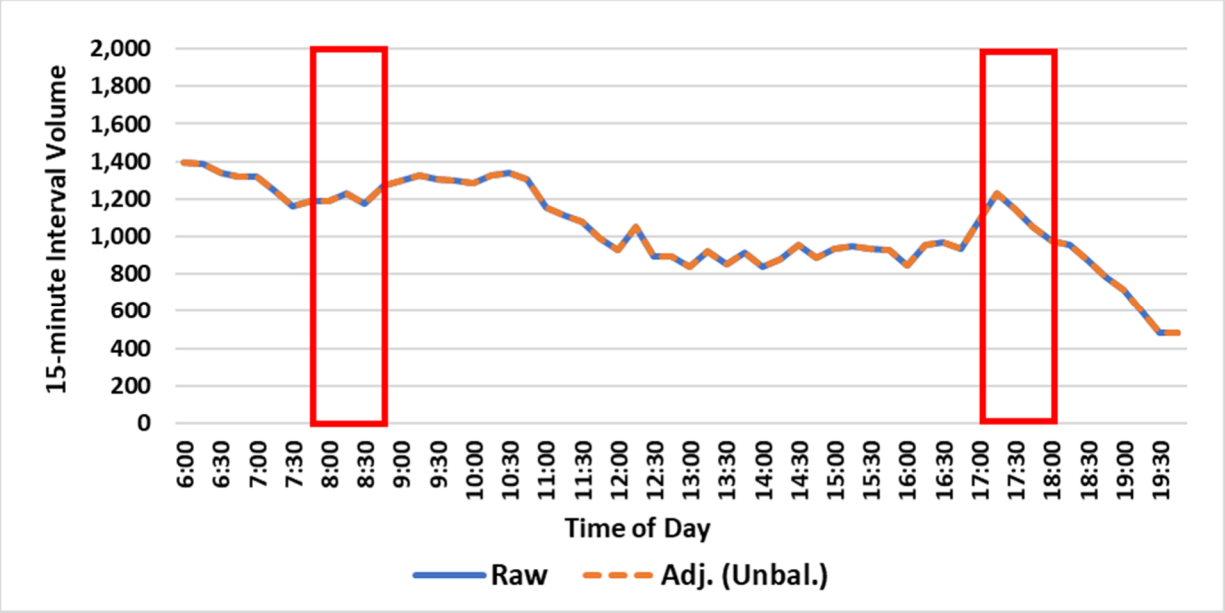
Figure B-6 SR 85 at Homestead Road Southbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

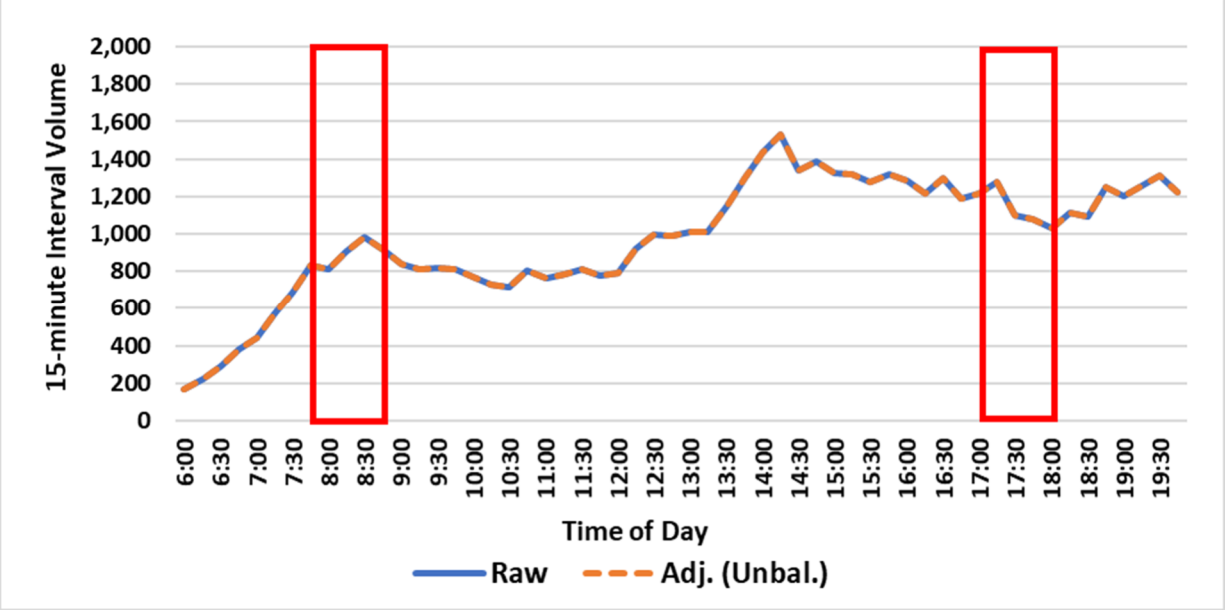
Figure B-7 SR 85 at Quito Road Northbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

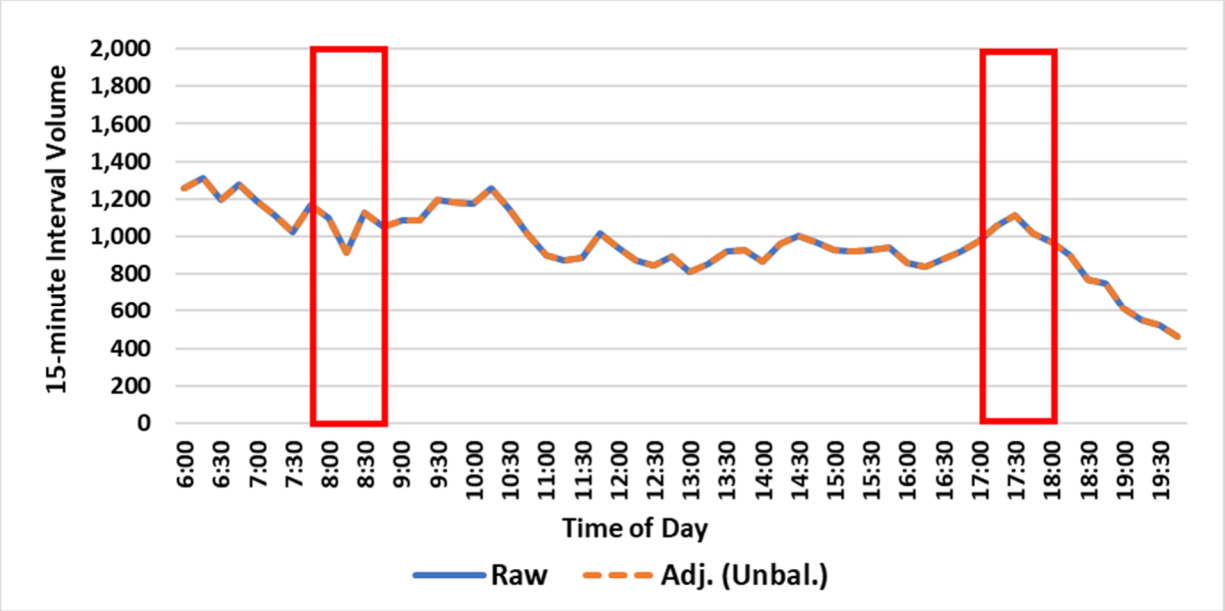
Figure B-8 SR 85 at Quito Road Southbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

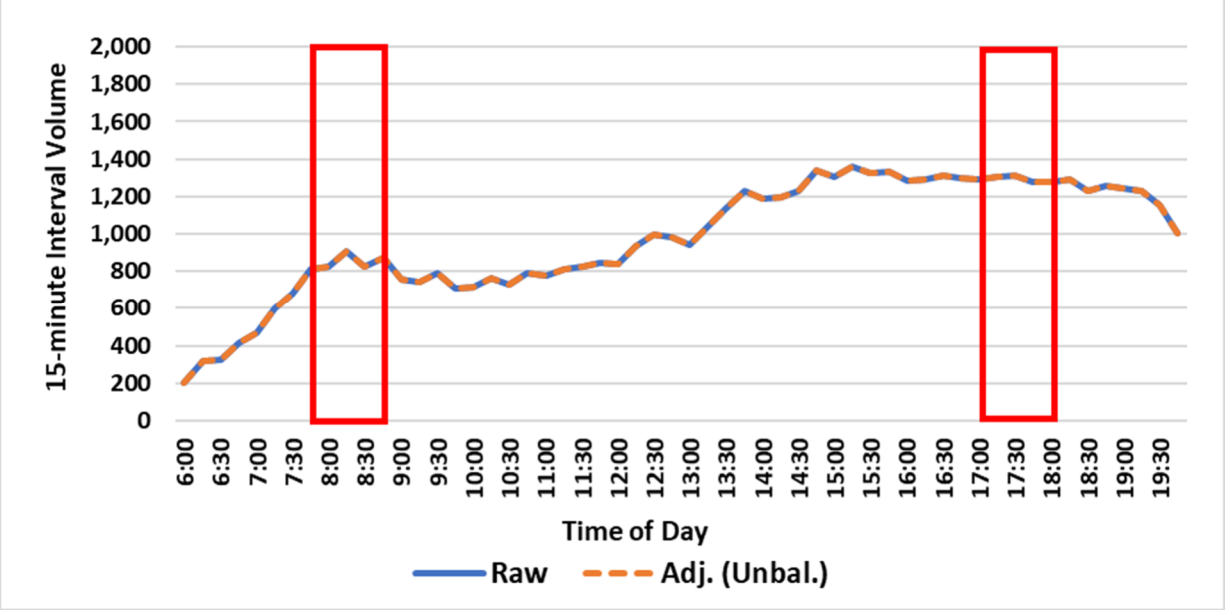
Figure B-9 SR 85 at Meridian Avenue Northbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-10 SR 85 at Meridian Avenue Southbound 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: Adj. = Adjusted, Unbal. = Unbalanced.

B.2.3.2 Peak Hour Determination

Peak hours on the SR 85 corridor in the AM and PM peak periods were determined based on the hour (four consecutive 15-minute intervals) with the highest combined total volume at the four

mainline data collection sites. The adjusted (unbalanced) mainline volumes were used for this purpose. The AM peak hour was determined to be 7:45 am to 8:45 am and the PM peak hour was determined to be 5:00 pm to 6:00 pm, which formed 18.4 percent of AM peak period (6 am to 12 pm) and 18.1 percent of PM peak period (2 pm to 8 pm) daily combined total volume at the mainline data collection sites, respectively. The peak hours are marked as *red* rectangles in **Figures B-3** through **B-10**.

Table B-4 is showing the unbalanced volumes and vehicle classification information in the identified AM and PM peak hours for mainline locations. **Figure B-11** is showing the peak hour total volume information on mainline locations in a bar chart format. Prior to balancing, the mainline location of SR 85 at Homestead Road has the highest traffic volume of approximately 4,980 vehicles in the northbound direction in the AM peak hour; while the mainline location of SR 85 at Meridian Avenue has the highest traffic volume of 5,190 vehicles in the southbound direction in the PM peak hour.

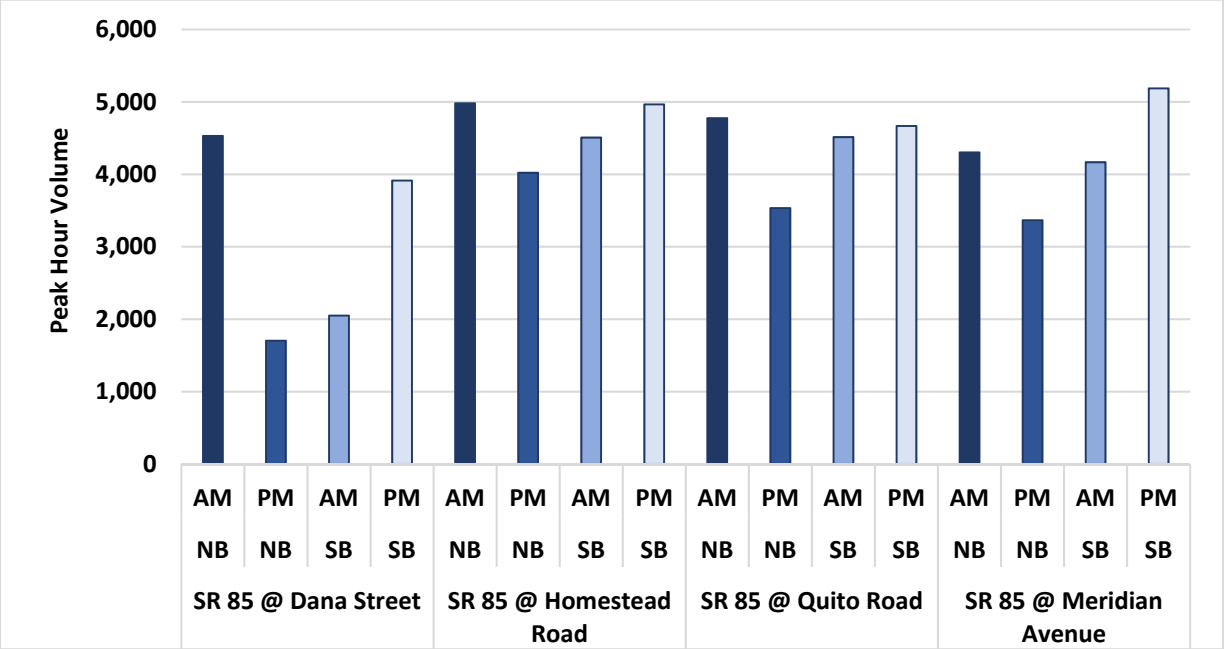
Table B-4 SR 85 AM and PM Peak Hour Unbalanced Volumes at Mainline Count Locations

Map ID	Location ID	Count Location	Dir.	Peak Hour	Non-HOV Lanes - Auto Vol.	Non-HOV Lanes - Bus Vol.	Non-HOV Lanes - Truck Vol.	Non-HOV Lanes - Total Vol.	HOV Lanes - Auto Vol.	HOV Lanes - Bus Vol.	HOV Lanes - Truck Vol.	HOV Lanes - Total Vol.	All – Auto Vol.	All – Bus Vol.	All – Truck Vol.	All Lanes - Total Vol.
Fig. B-1 #1	ML-3	SR 85 at Dana Street	NB	AM	3,140	5	23	**3,168**	1,329	30	2	**1,361**	4,469	35	25	**4,529**
			NB	PM	1,354	15	21	**1,390**	303	9	1	**313**	1,657	23	22	**1,703**
			SB	AM	1,624	12	14	**1,650**	378	17	5	**400**	2,002	29	19	**2,050**
			SB	PM	2,555	1	9	**2,565**	1,317	30	2	**1,349**	3,873	31	11	**3,914**
Fig. B-1 #2	ML-1	SR 85 at Homestead Road	NB	AM	3,394	4	36	**3,434**	1,517	29	1	**1,547**	4,911	33	37	**4,981**
			NB	PM	3,576	19	65	**3,660**	345	15	1	**361**	3,921	35	66	**4,021**
			SB	AM	4,117	24	14	**4,156**	336	15	0	**351**	4,453	39	14	**4,507**
			SB	PM	3,853	16	5	**3,875**	1,068	23	1	**1,092**	4,921	39	6	**4,966**
Fig. B-1 #3	ML-4	SR 85 at Quito Road	NB	AM	3,146	1	16	**3,163**	1,581	28	4	**1,613**	4,727	29	20	**4,776**
			NB	PM	3,122	16	10	**3,148**	379	7	0	**386**	3,501	23	10	**3,534**
			SB	AM	3,685	6	8	**3,699**	792	23	0	**815**	4,477	29	8	**4,514**
			SB	PM	3,028	5	0	**3,033**	1,605	27	2	**1,634**	4,633	32	2	**4,667**
Fig. B-1 #4	ML-2	SR 85 at Meridian Avenue	NB	AM	2,747	4	16	**2,767**	1,521	11	4	**1,536**	4,268	15	20	**4,303**
			NB	PM	2,967	10	9	**2,986**	379	1	0	**380**	3,346	11	9	**3,366**
			SB	AM	3,325	3	9	**3,337**	821	7	2	**830**	4,146	10	11	**4,167**
			SB	PM	3,550	10	4	**3,564**	1,606	8	9	**1,623**	5,156	18	13	**5,187**

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: HOV = High Occupancy Vehicle, Dir. = Direction, Vol. = Volume, NB = Northbound, SB = Southbound, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

Figure B-11 SR 85 AM and PM Peak Hour Unbalanced Volumes at Mainline Count Locations



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: NB = Northbound, SB = Southbound, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

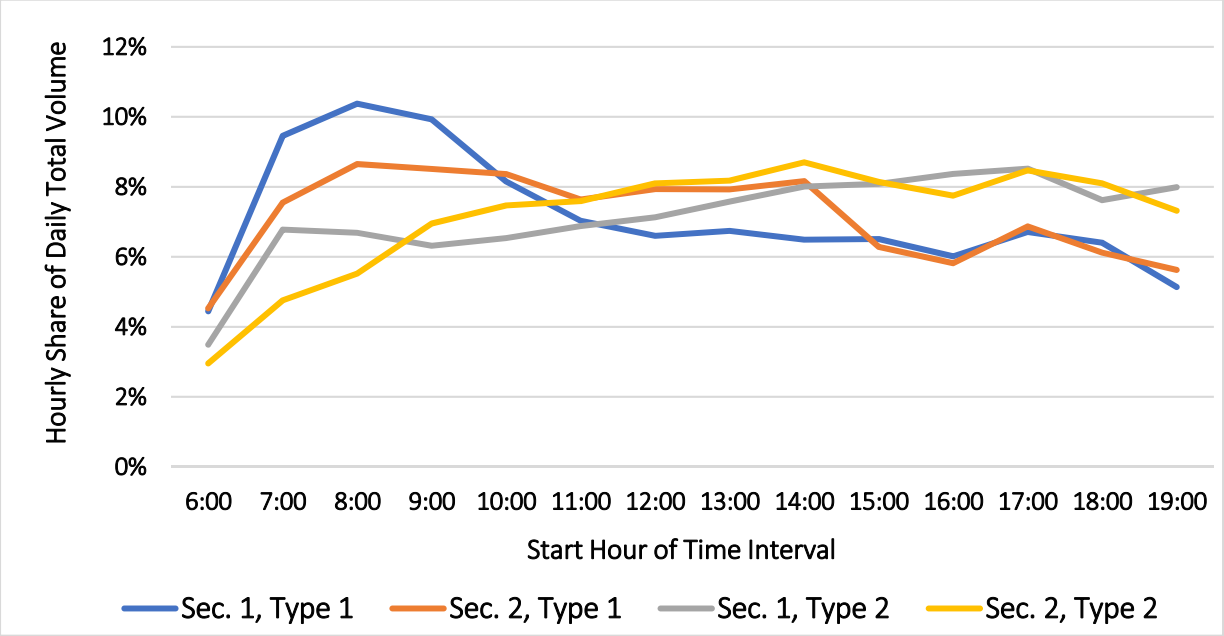
B.2.3.3 SR 85 Ramp Traffic Adjustments

Ramp counts were collected along SR 85 between SR 87 in the south and US 101 in the north for 50 ramps on all interchanges except freeway-to-freeway interchanges across multiple days. To smooth the spatial and temporal fluctuations over the large number of ramp counts introduced by varying mainline and cross street traffic conditions and to ease the volume balancing for the SR 85 corridor, hourly traffic counts on the ramps were aggregated and an average hourly pattern for ramp volumes was established. Before the averaging of hourly patterns, the ramps were classified into four groups:

- **Sec 1, Type 1**: Ramps within Section 1 of SR 85 Corridor and with AM peak period (6 am to 12 pm) total volume greater than PM peak period (2 pm to 8 pm) total volume
- **Sec 2, Type 1**: Ramps within Section 2 of SR 85 Corridor and with AM peak period (6 am to 12 pm) total volume greater than PM peak period (2 pm to 8 pm) total volume
- **Sec 1, Type 2**: Ramps within Section 1 of SR 85 Corridor and with AM peak period (6 am to 12 pm) total volume less than or equal to PM peak period (2 pm to 8 pm) total volume
- **Sec 2, Type 2**: Ramps within Section 2 of SR 85 Corridor and with AM peak period (6 am to 12 pm) total volume less than or equal to PM peak period (2 pm to 8 pm) total volume

Figure B-12 shows the average hourly traffic distribution by ramp group type. The average hourly traffic pattern for a ramp group was applied to the 15-minute interval ramp counts for ramps within each ramp group to estimate unbalanced 15-minute interval ramp volumes. Comparison of the raw counts and unbalanced volume estimates for ramps from the north to the south along SR 85 are shown in **Figures B-13** through **B-63**.

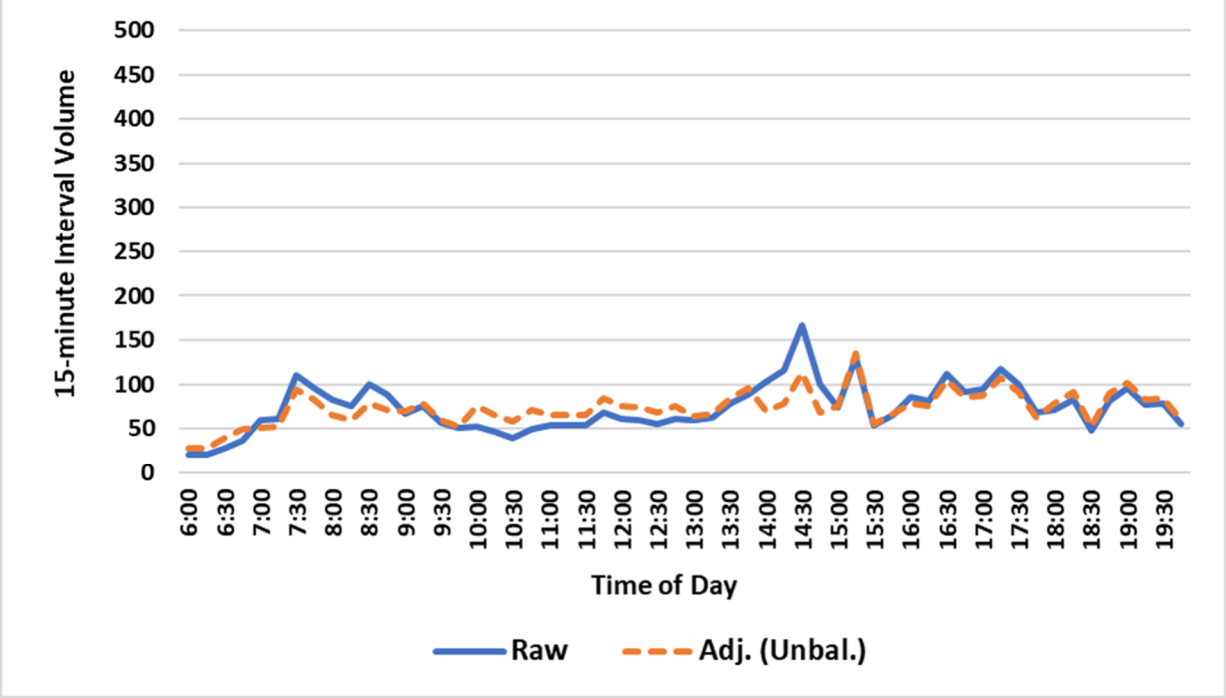
Figure B-12 SR 85 Ramp Average Hourly Traffic Distribution by Ramp Group Type



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.

Note: Ramp groups are defined by Section and Type. Section can be either Sec. 1: US 101 to I-280; or Sec. 2: I-280 to SR 87. Type can be either Type 1: AM peak period (6 am to 12 pm) total volume greater than PM peak period (2 pm to 8 pm) total volume, or Type 2: AM peak period (6 am to 12 pm) total volume less than or equal to PM peak period (2 pm to 8 pm) total volume.

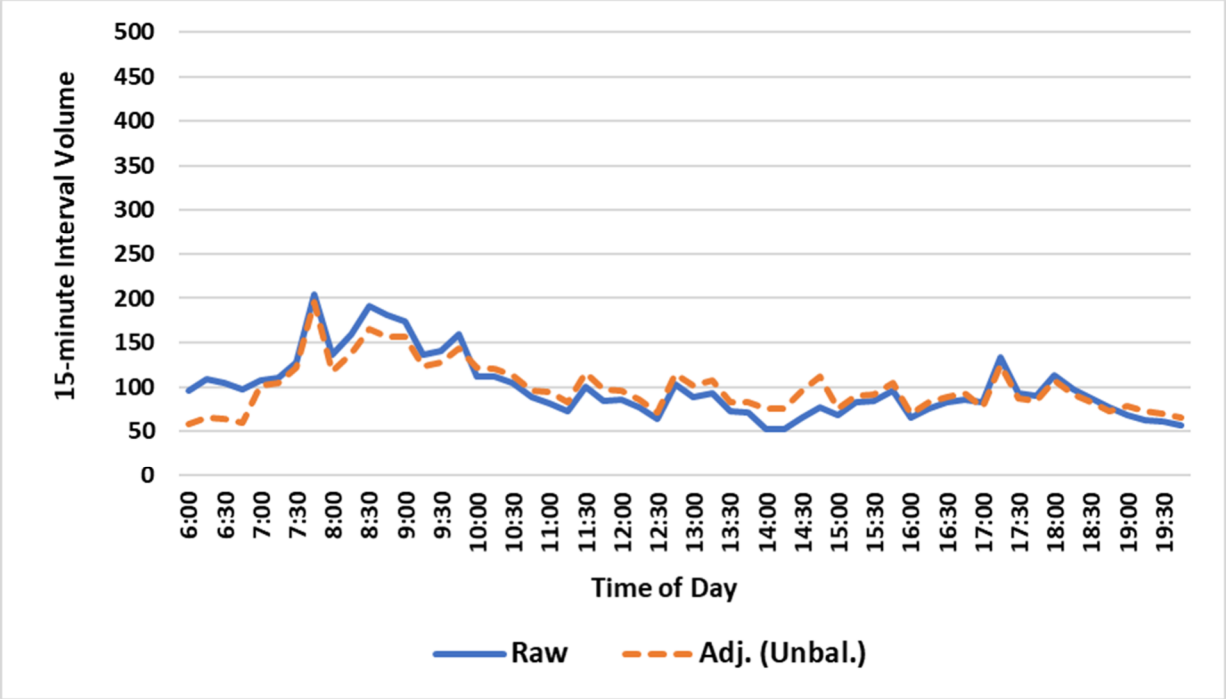
Figure B-13 SR 85 Southbound On-Ramp at Moffett Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.

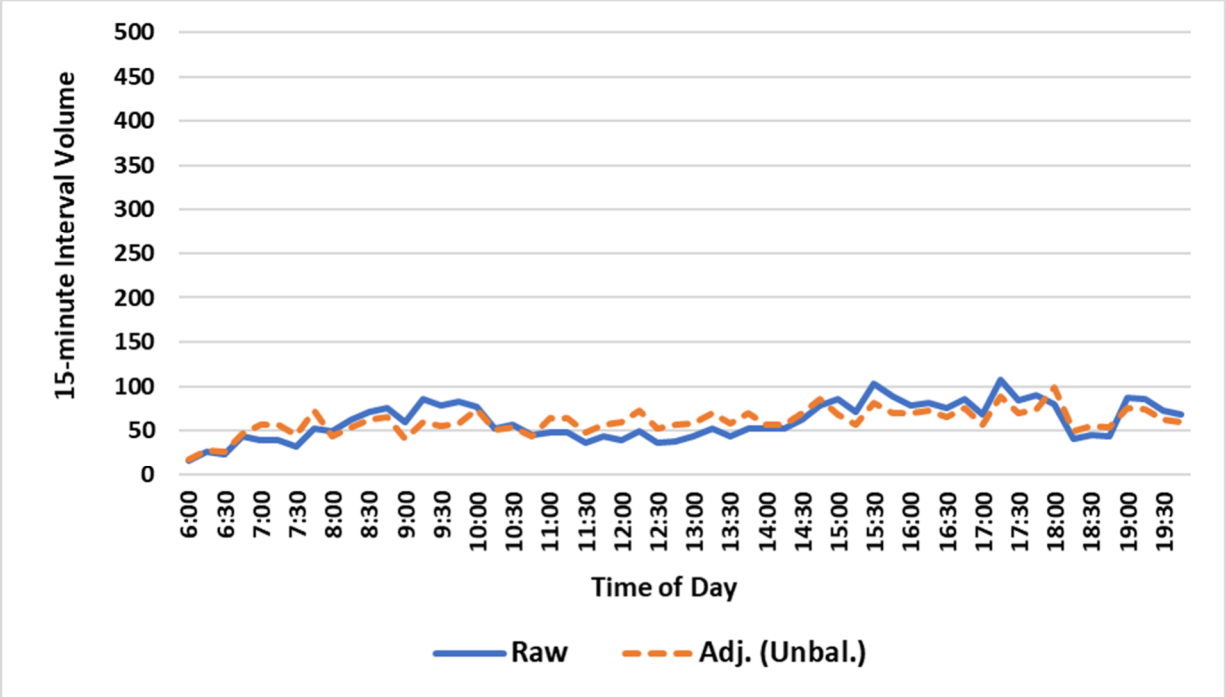
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-14 SR 85 Northbound Off-Ramp at Moffett Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



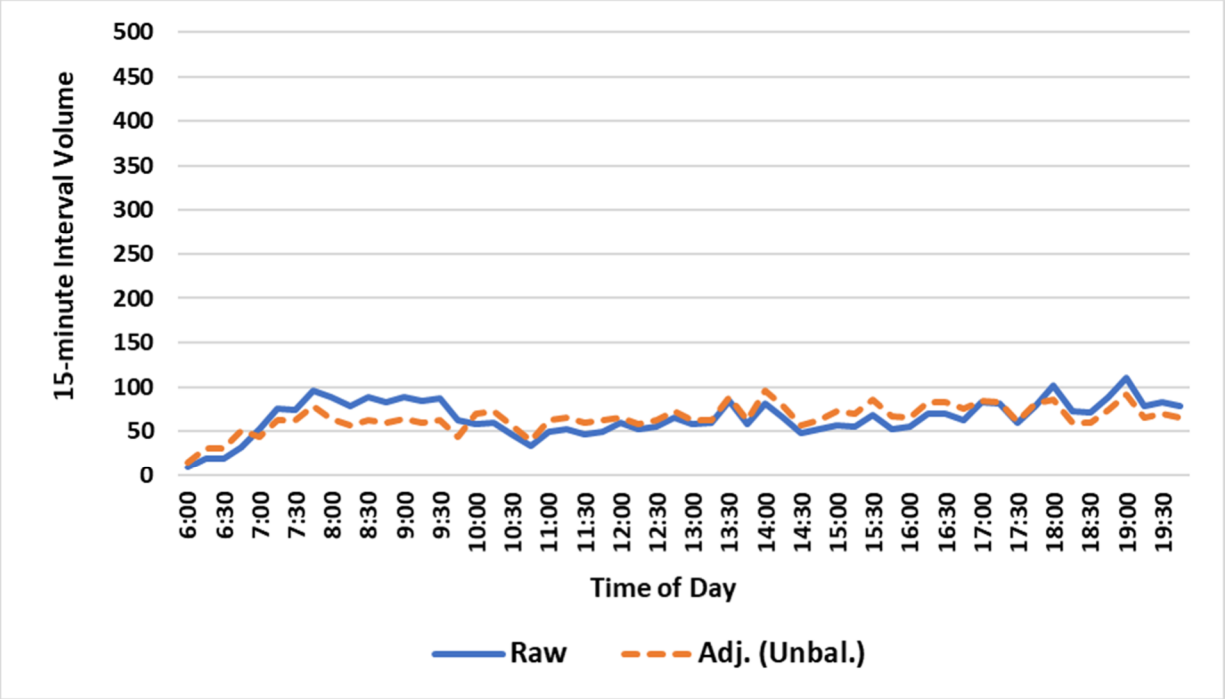
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-15 SR 85 Southbound Off-Ramp at Central Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



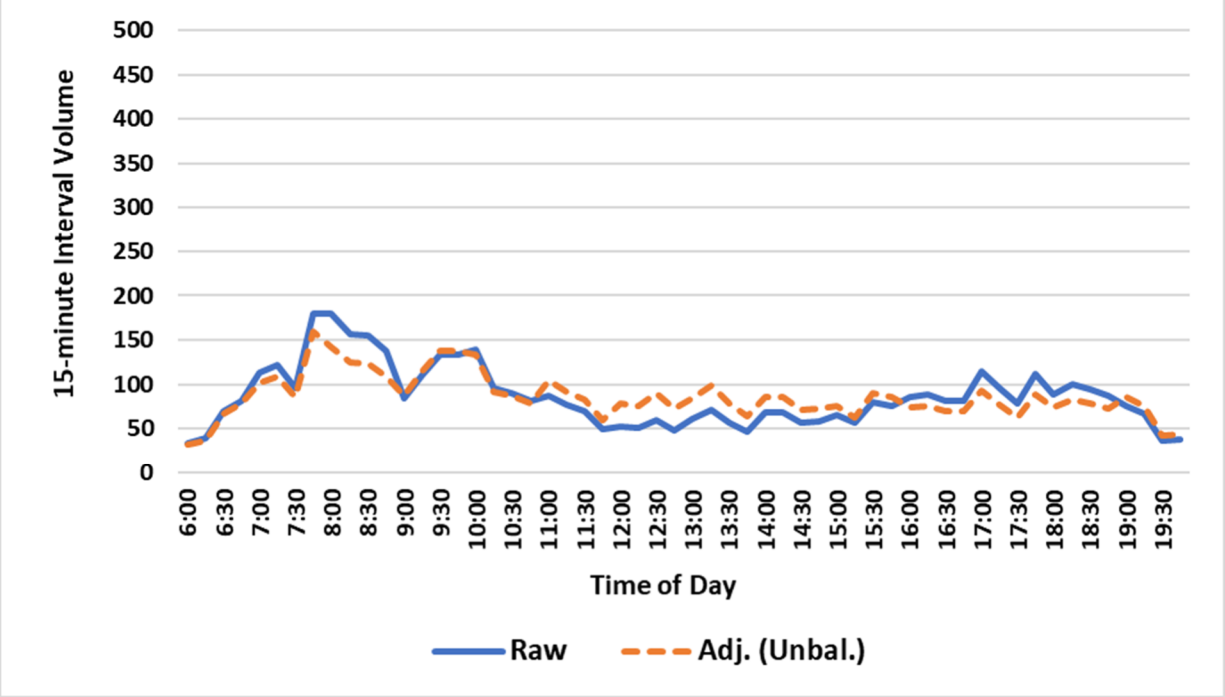
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-16 SR 85 Southbound On-Ramp at Central Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



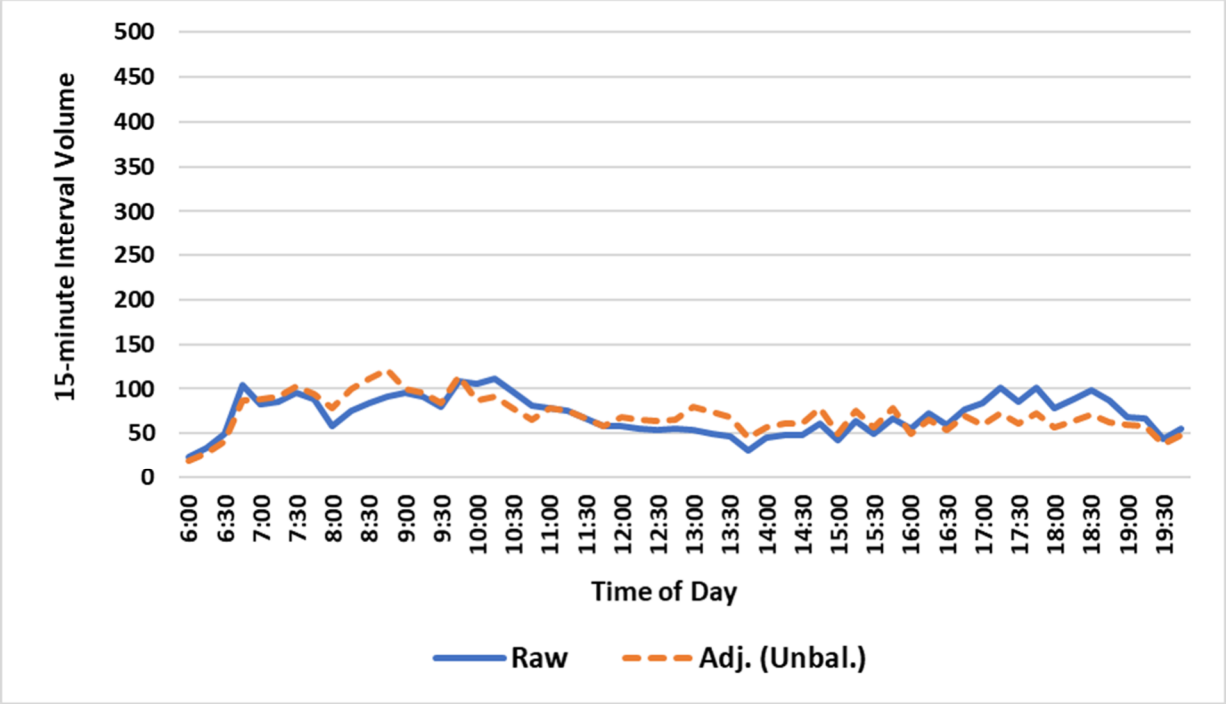
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-17 SR 85 Northbound On-Ramp at Central Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



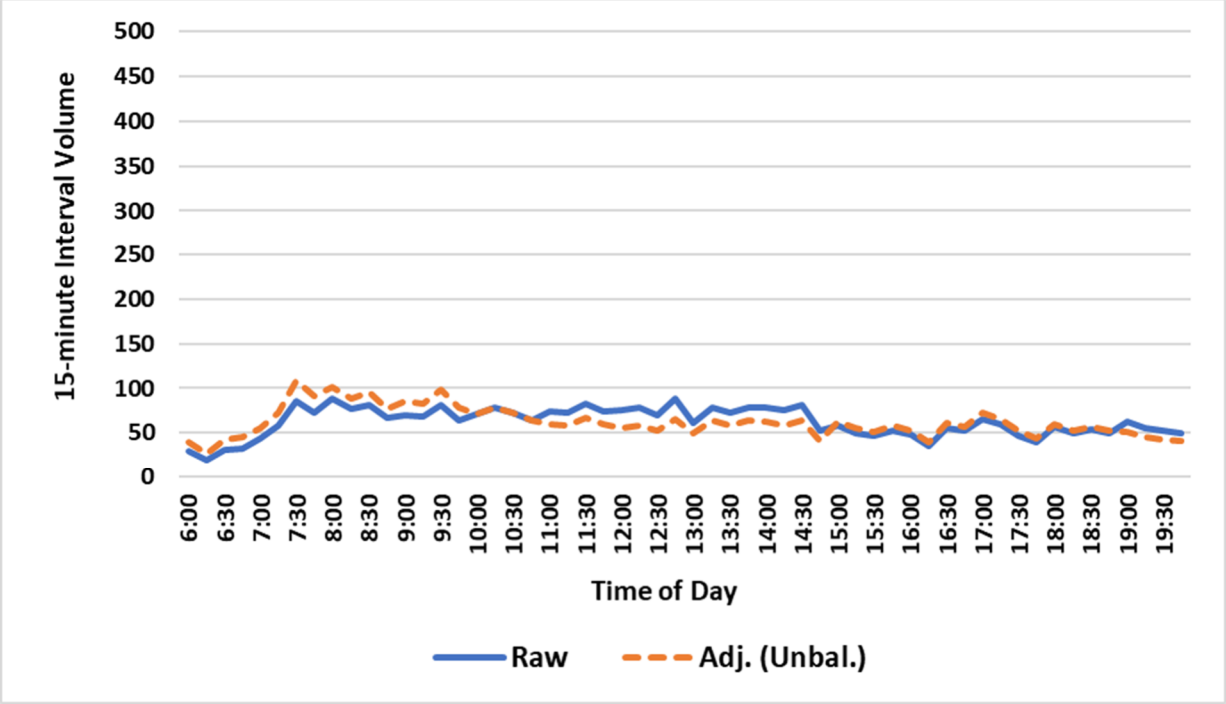
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-18 SR 85 Northbound Off-Ramp at Central Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



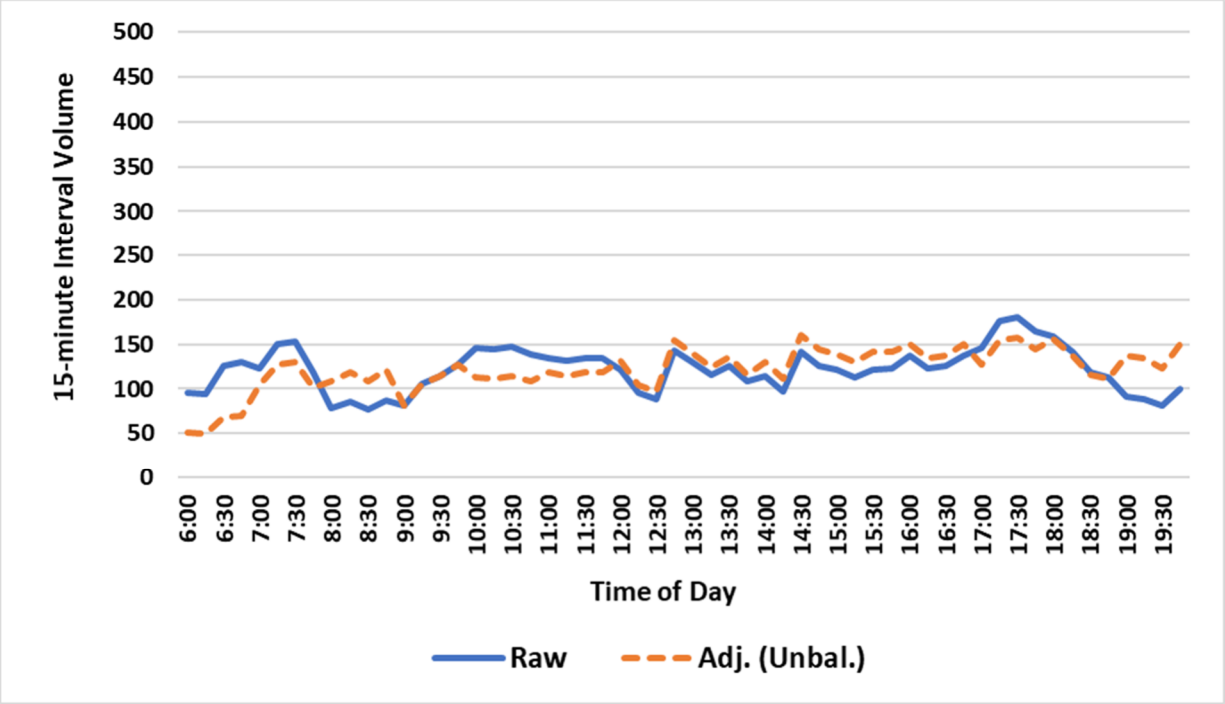
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-19 SR 85 Southbound On-Ramp at Westbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



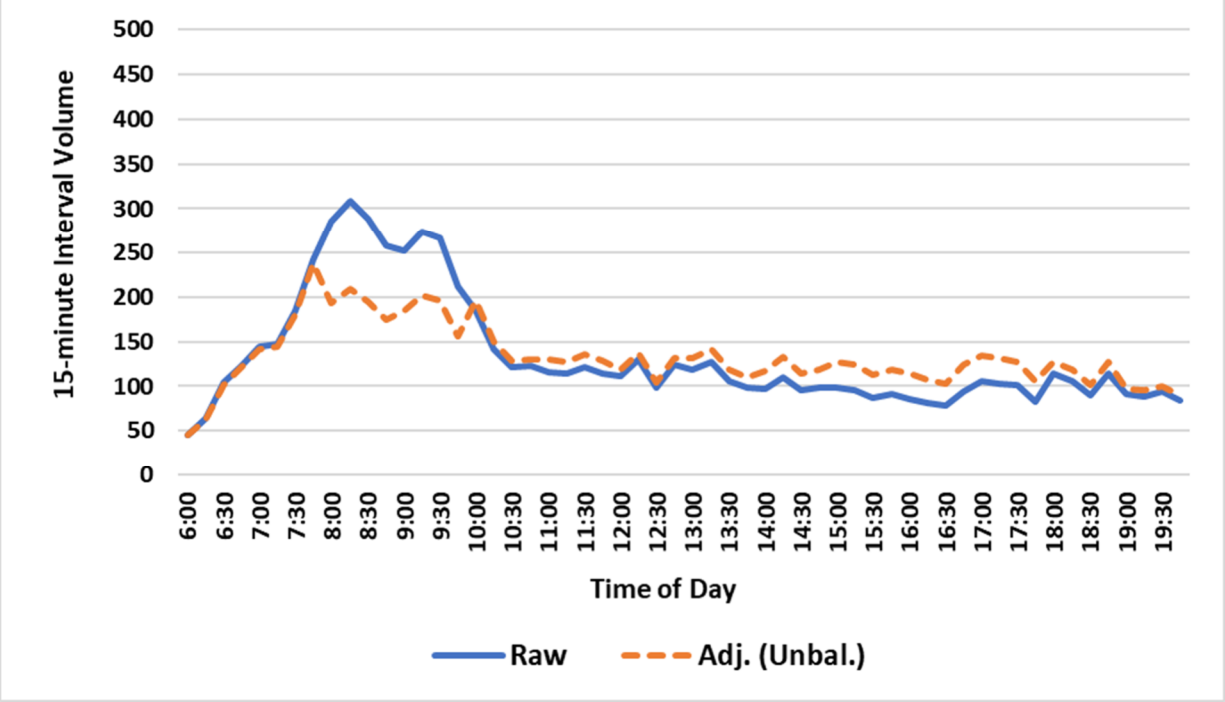
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-20 SR 85 Northbound Off-Ramp at Westbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



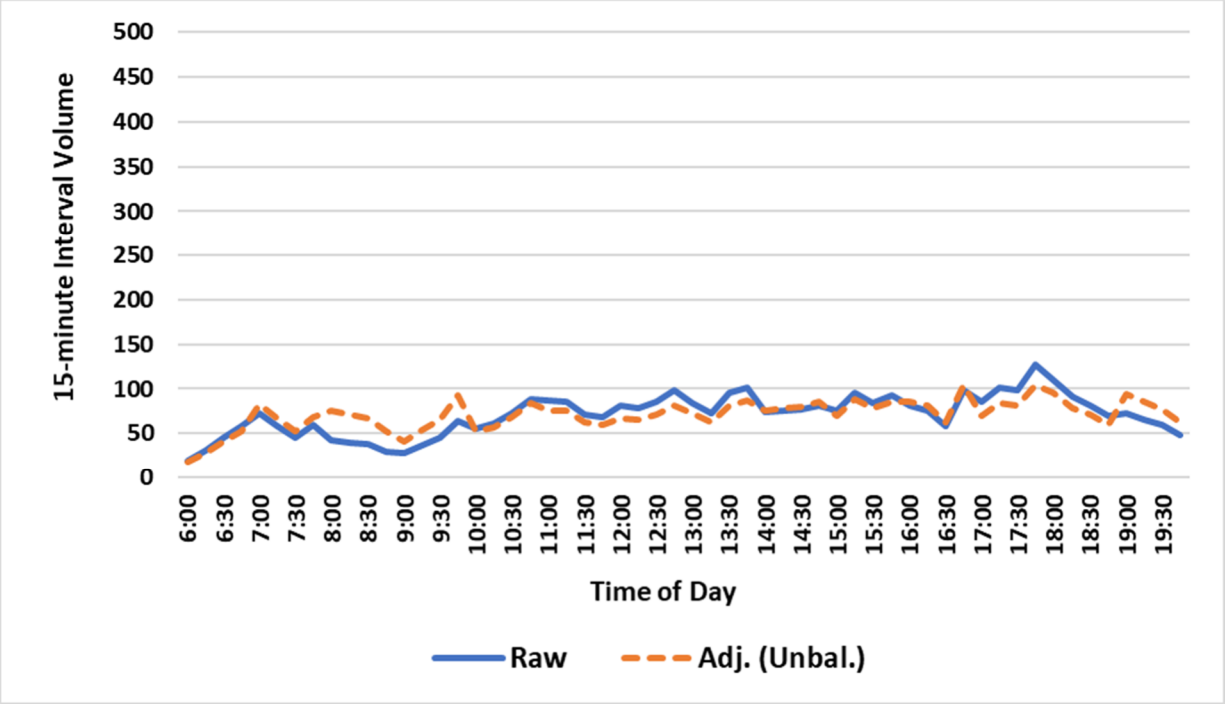
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-21 SR 85 Northbound On-Ramp at Westbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



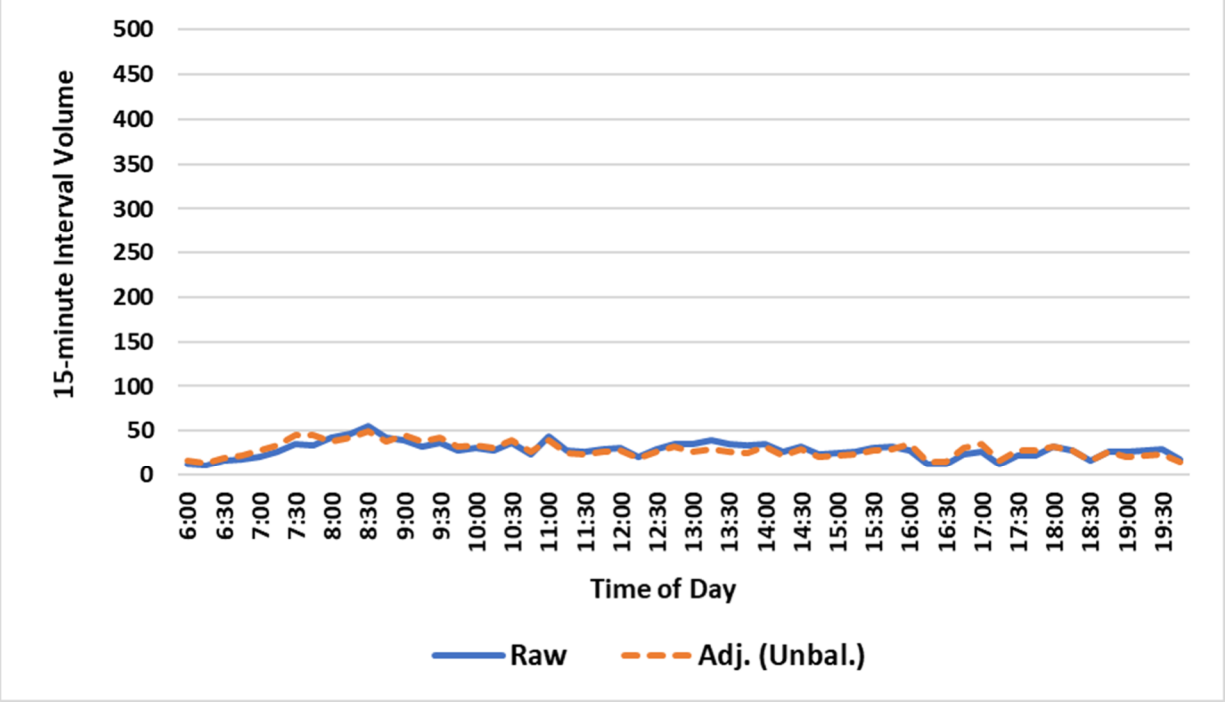
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-22 SR 85 Northbound Off-Ramp at Eastbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



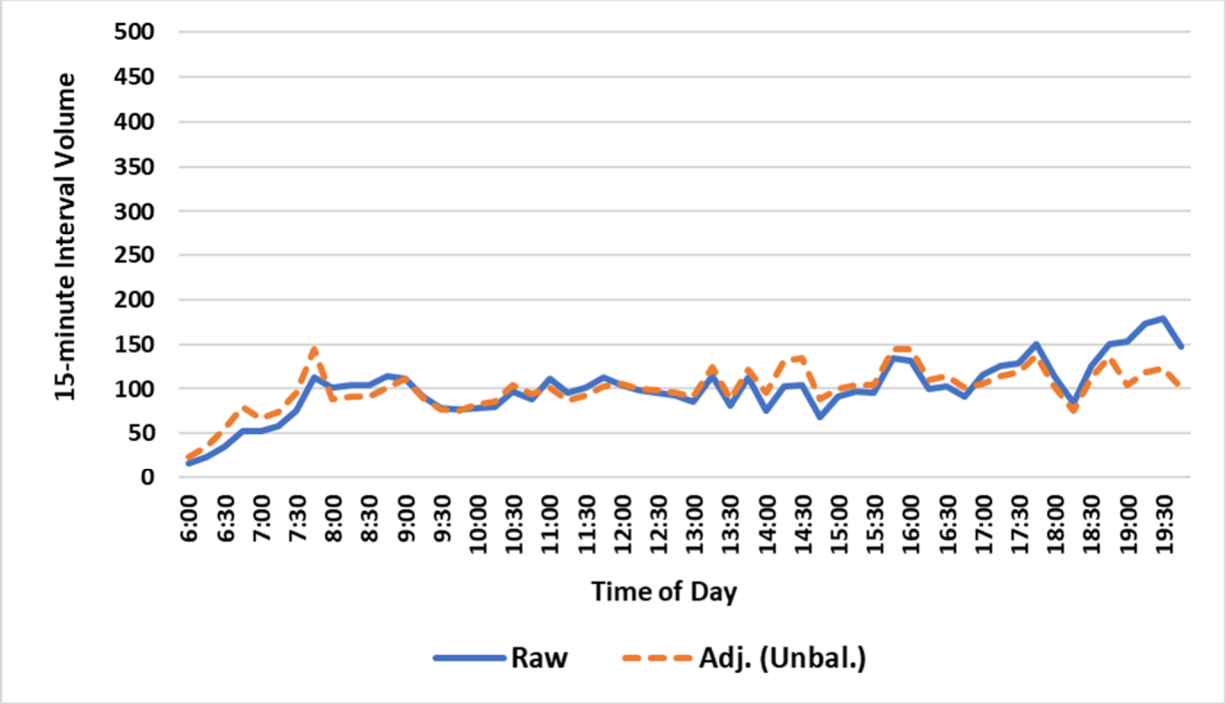
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-23 SR 85 Northbound On-Ramp at Eastbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



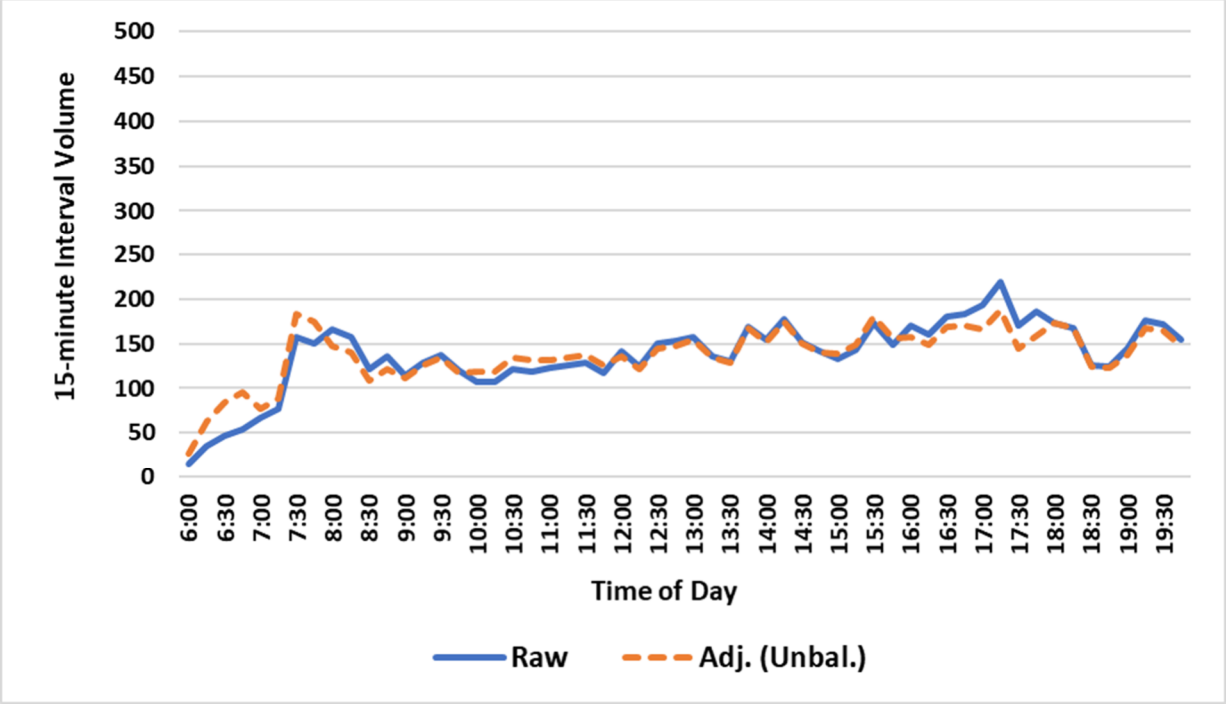
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-24 SR 85 Southbound Off-Ramp at Eastbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



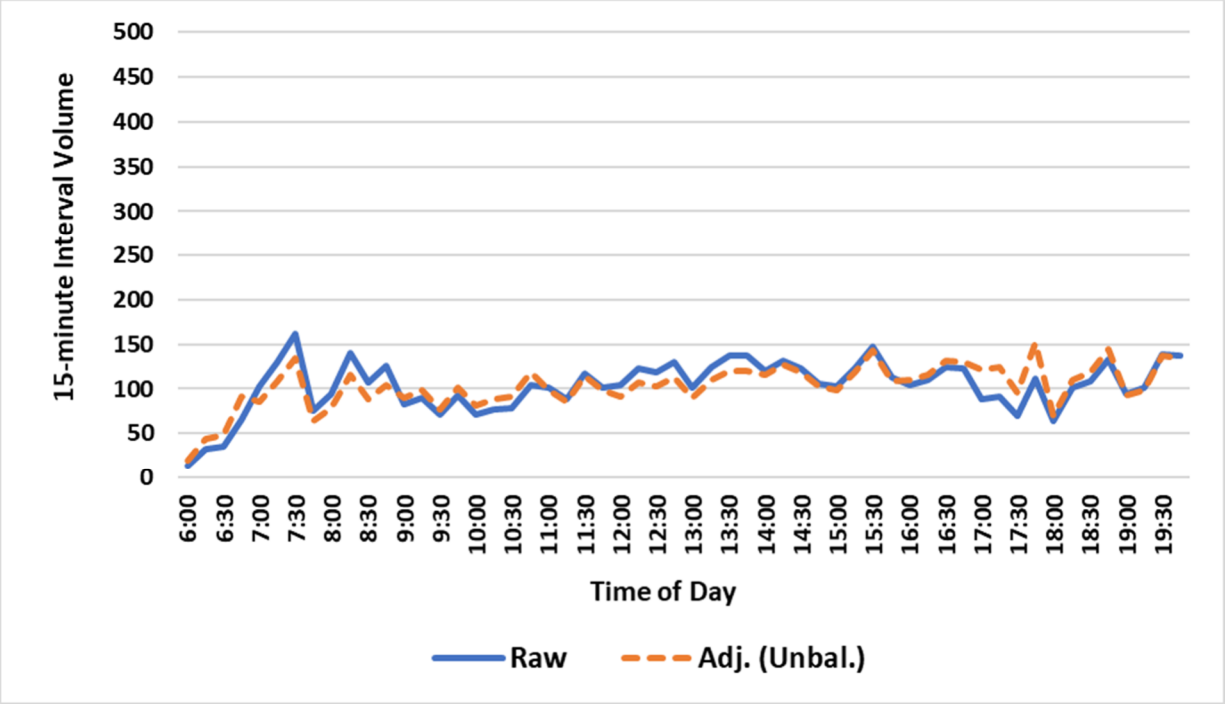
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-25 SR 85 Southbound On-Ramp at Eastbound El Camino Real 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



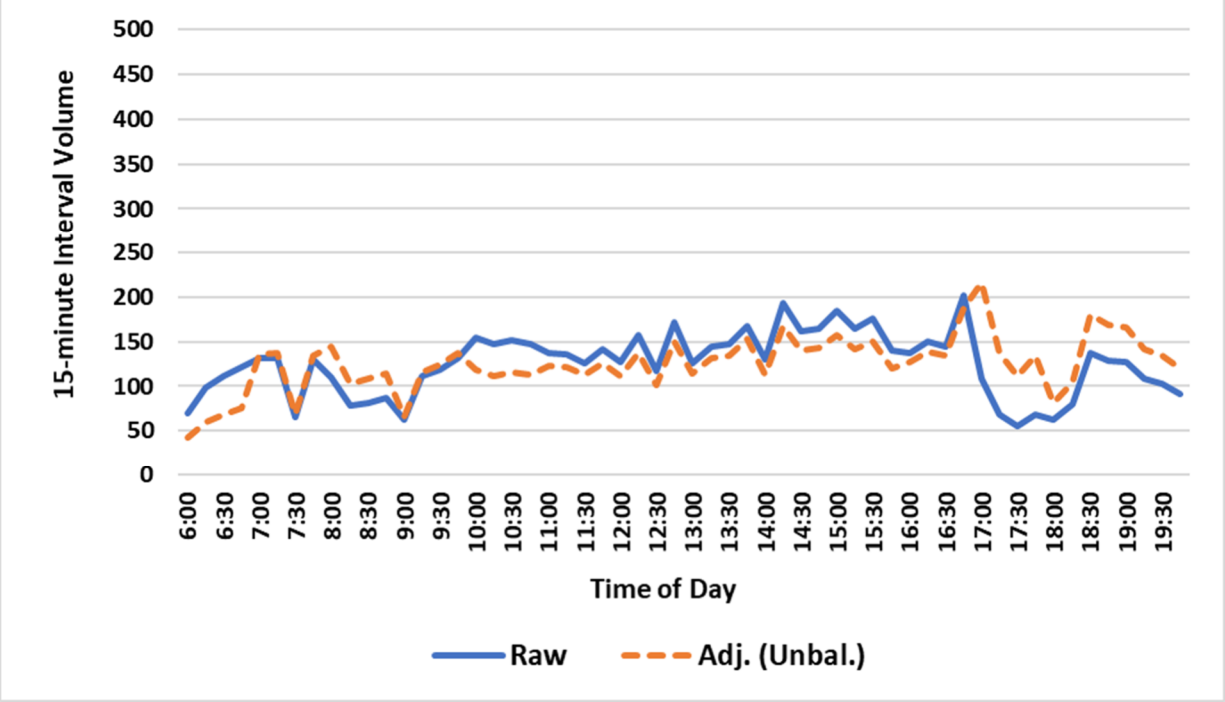
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-26 SR 85 Southbound Off-Ramp at West Fremont Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



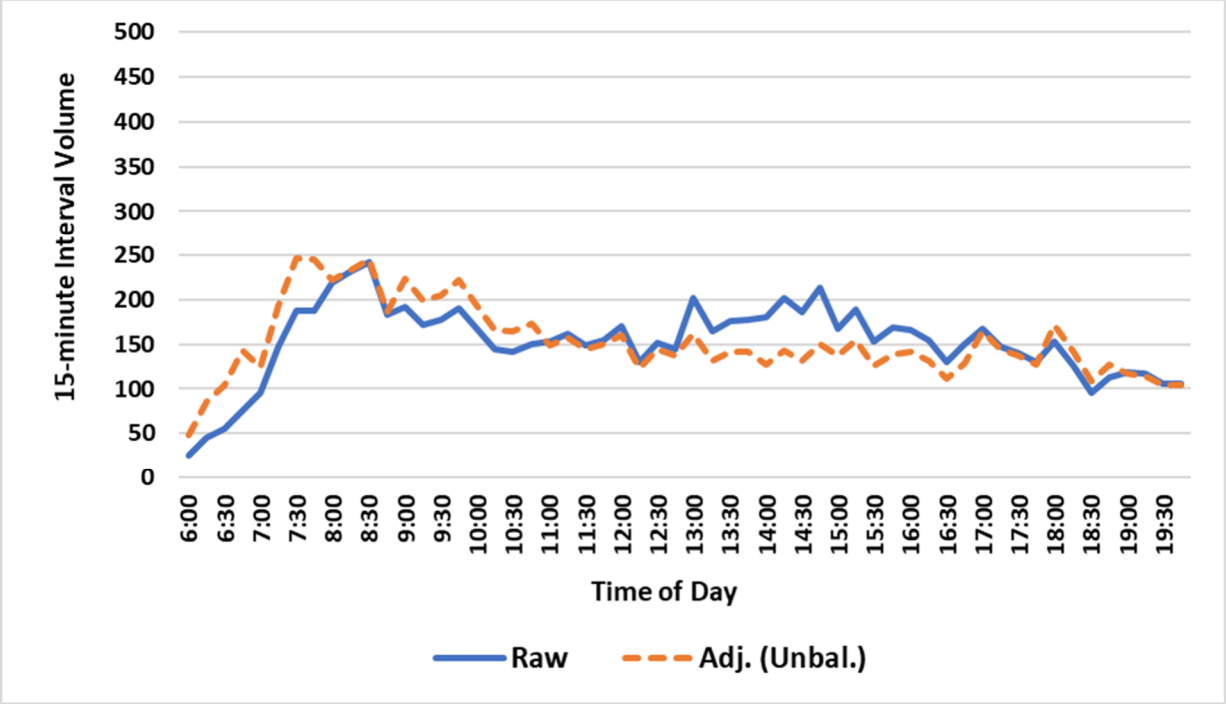
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-27 SR 85 Northbound Off-Ramp at West Fremont Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



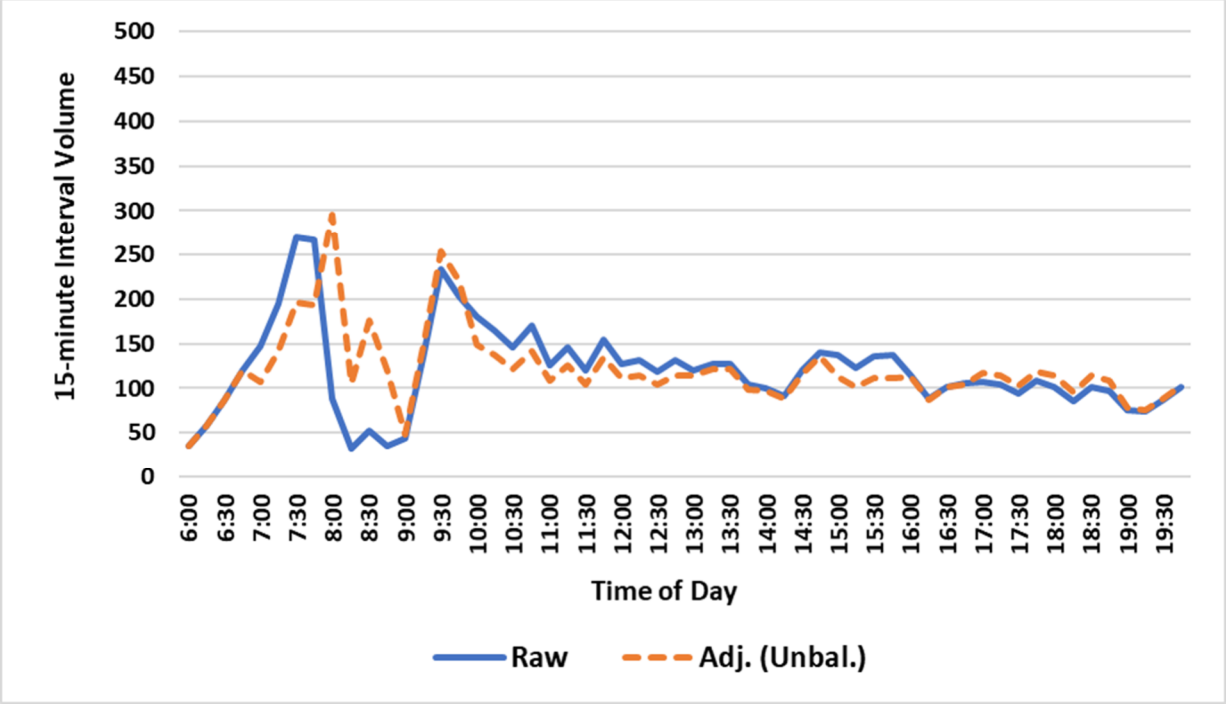
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-28 SR 85 Southbound On-Ramp at West Fremont Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



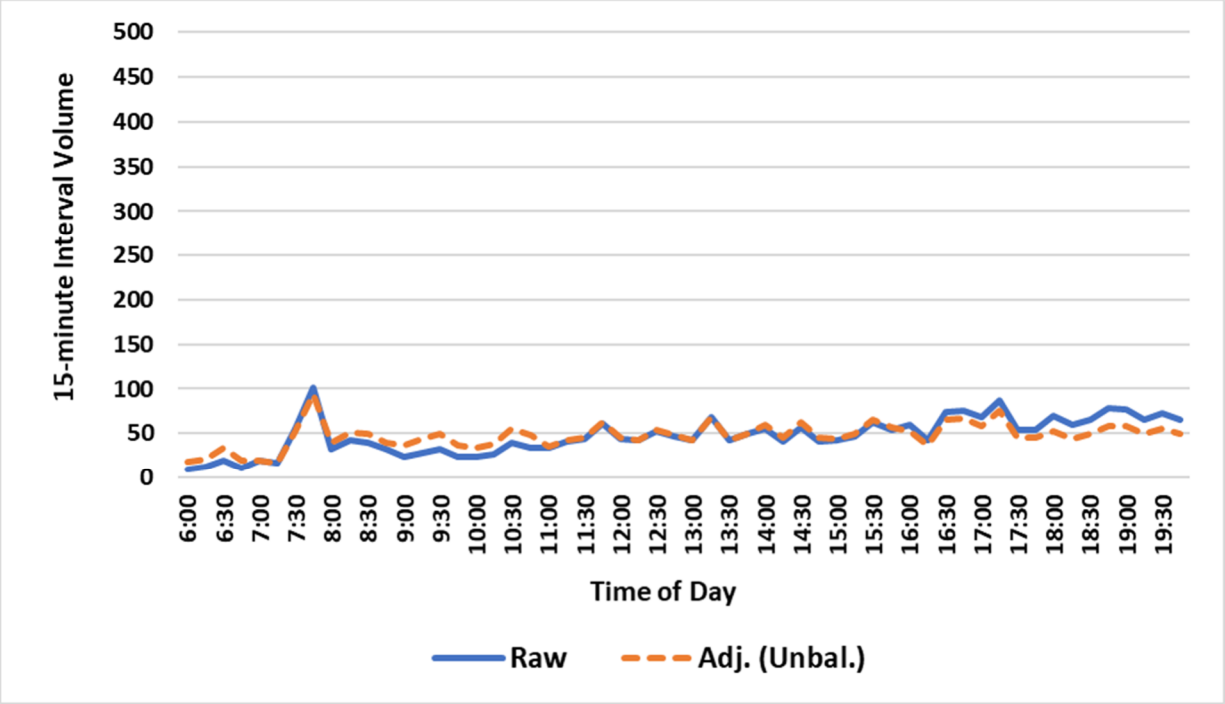
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-29 SR 85 Northbound On-Ramp at West Fremont Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



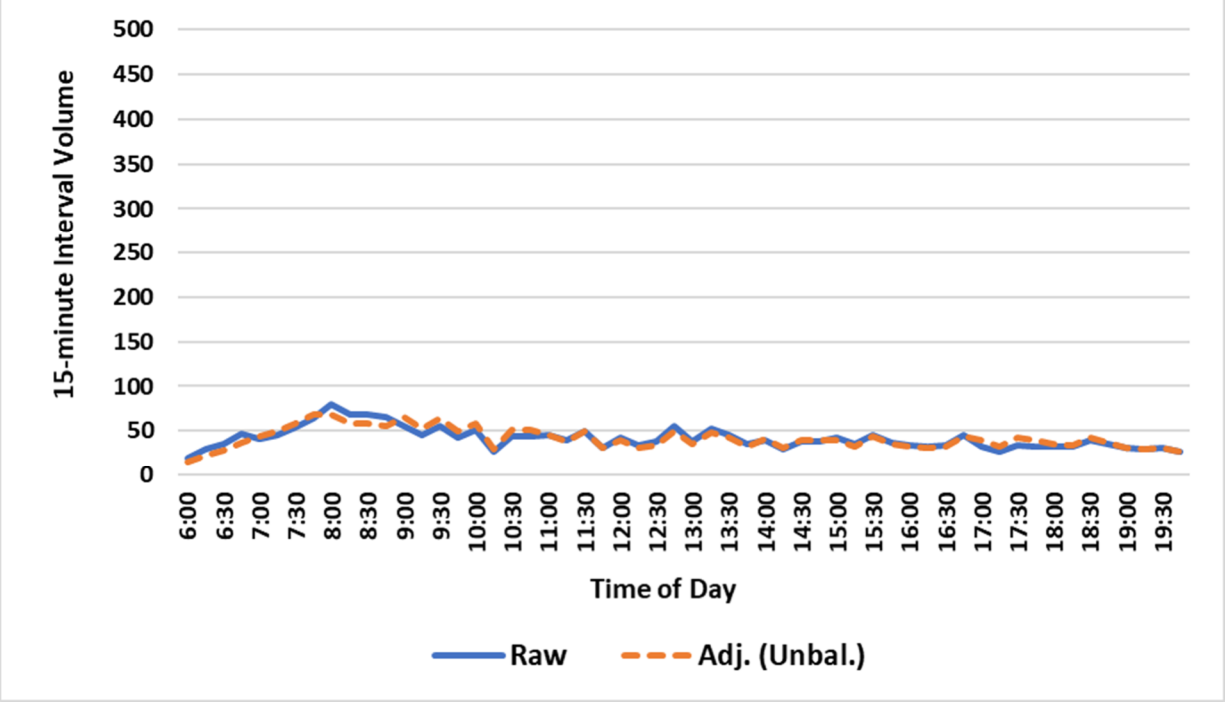
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-30 SR 85 Southbound Off-Ramp at Homestead Road 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



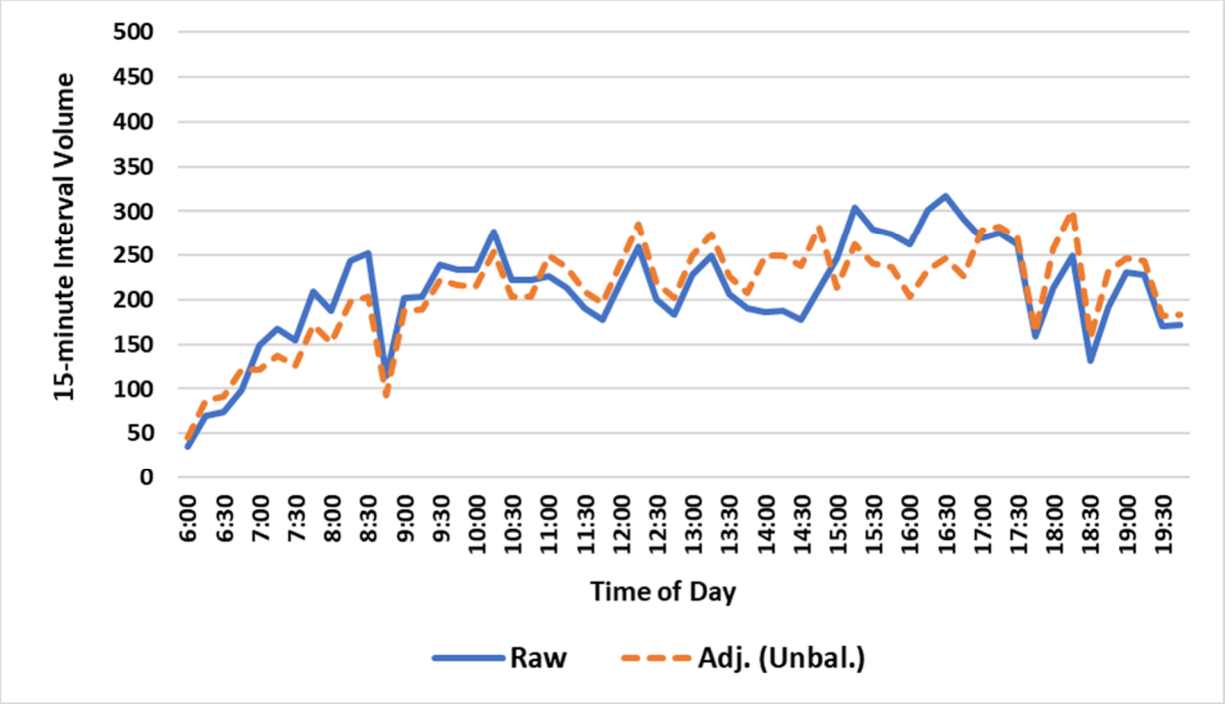
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-31 SR 85 Northbound On-Ramp at Homestead Road 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



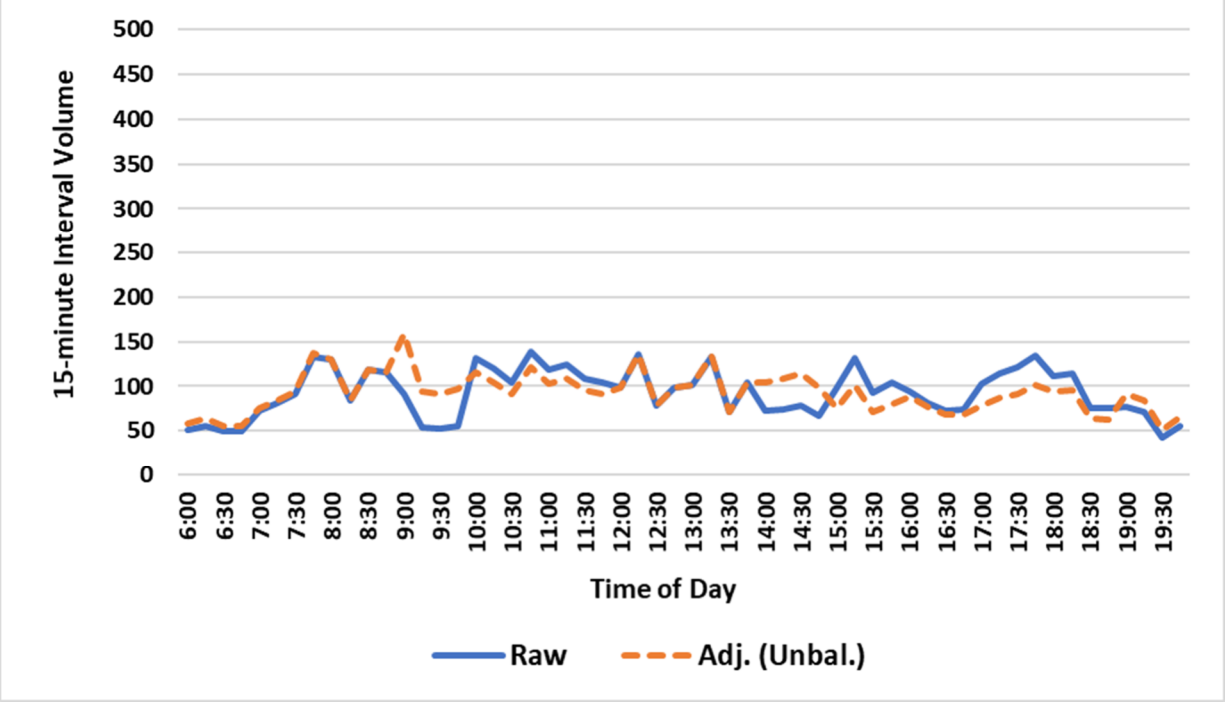
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-32 SR 85 Southbound Off-Ramp at Stevens Creek Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



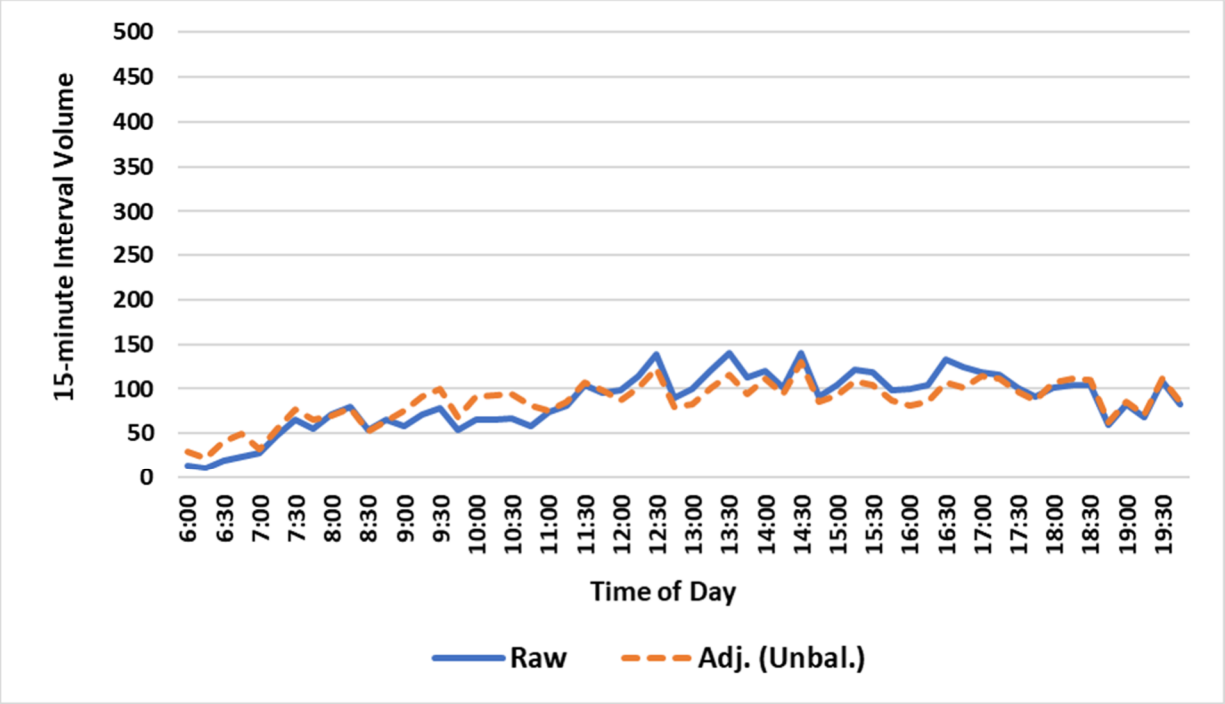
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-33 SR 85 Northbound Off-Ramp at Stevens Creek Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



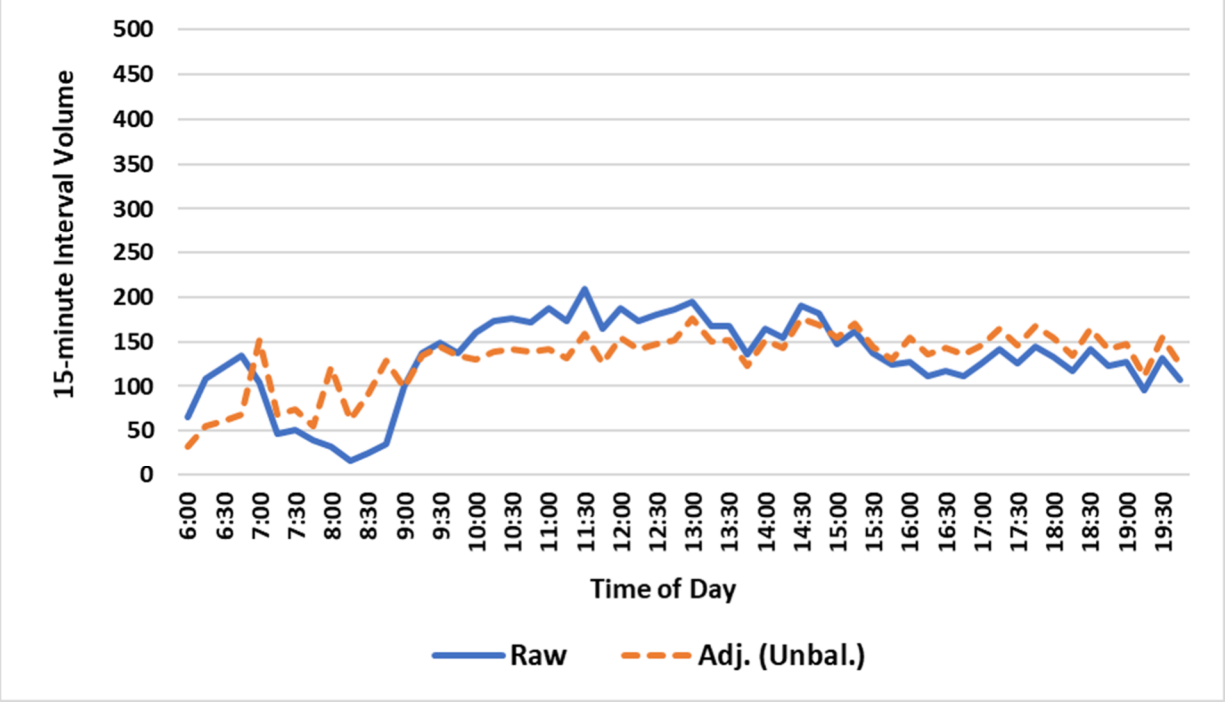
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-34 SR 85 Southbound On-Ramp at Stevens Creek Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



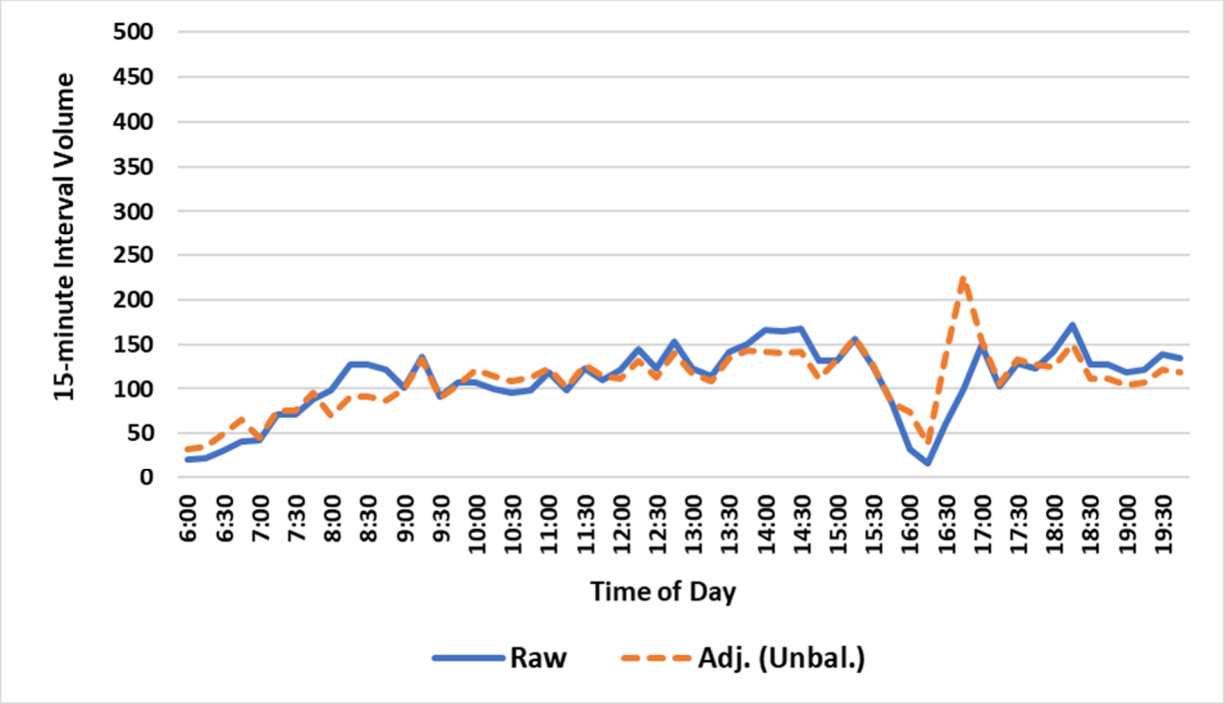
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-35 SR 85 Northbound On-Ramp at South De Anza Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



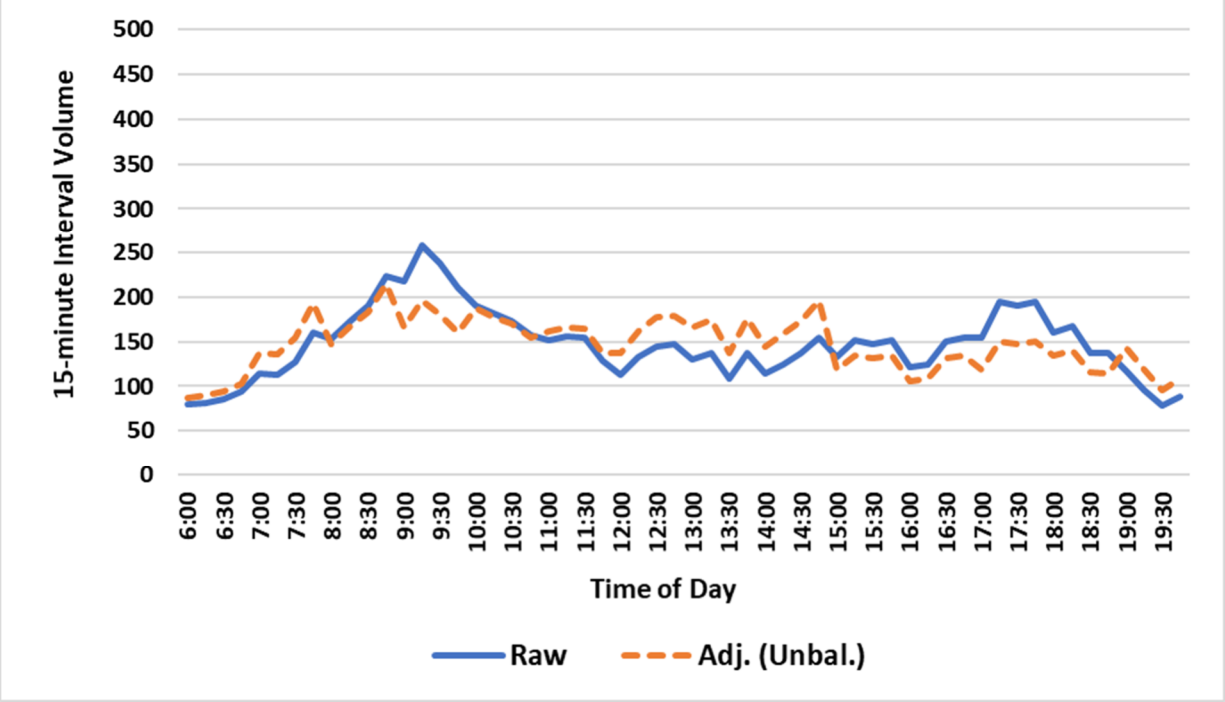
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-36 SR 85 Southbound On-Ramp at South De Anza Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



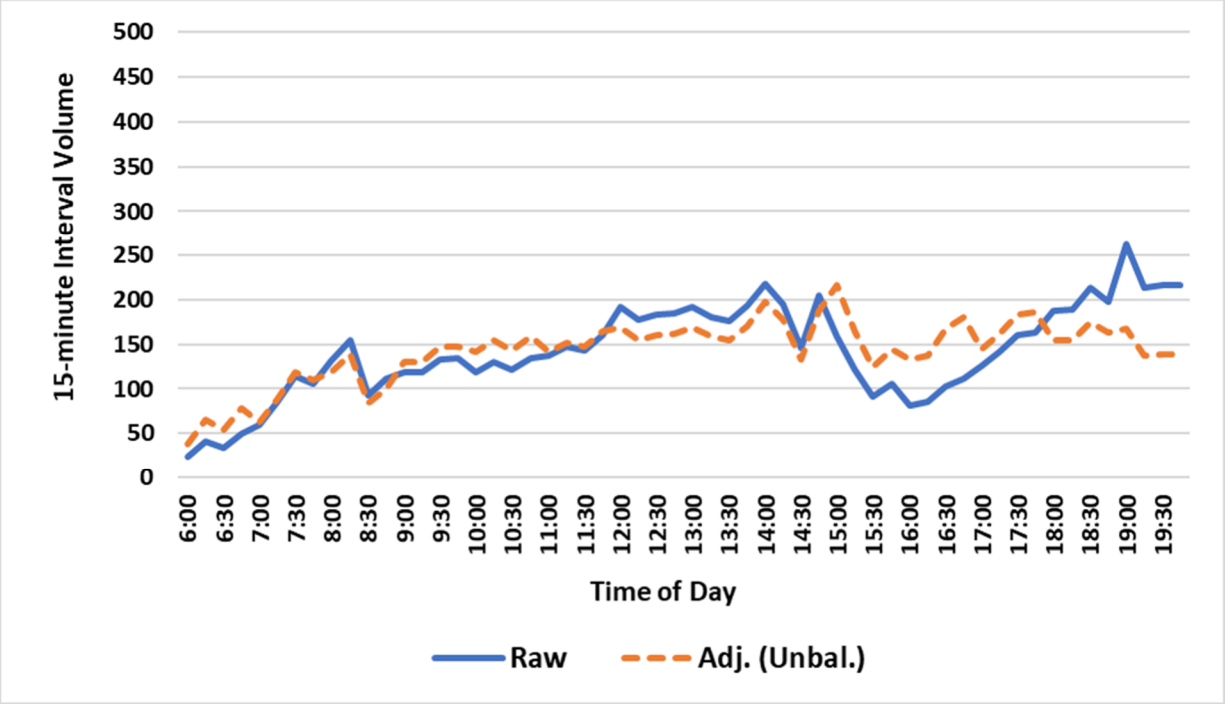
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-37 SR 85 Northbound Off-Ramp at South De Anza Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



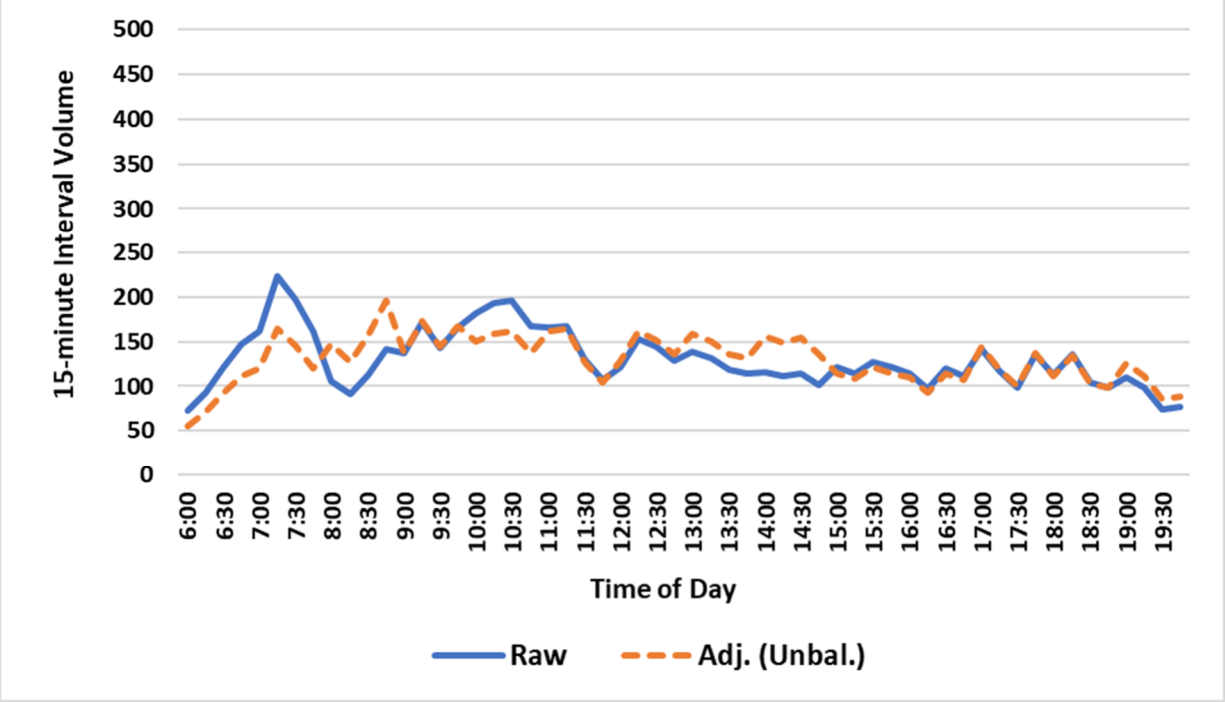
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-38 SR 85 Southbound Off-Ramp at South De Anza Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



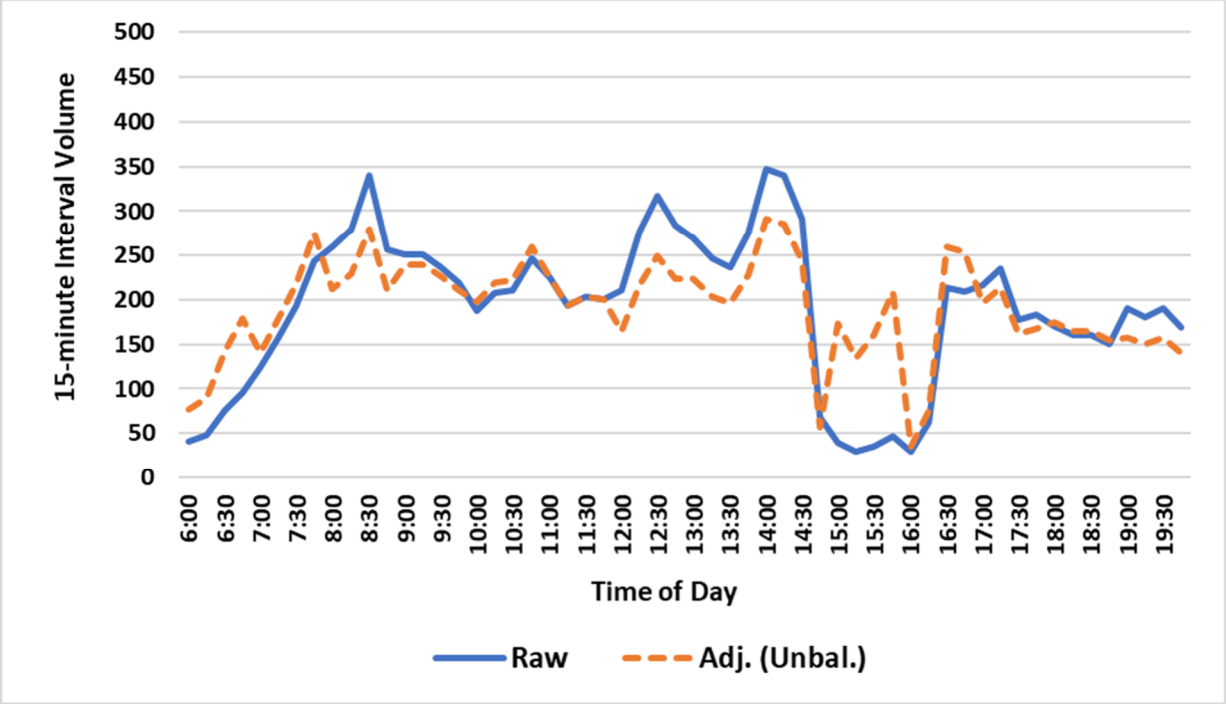
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-39 SR 85 Northbound On-Ramp at Saratoga Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



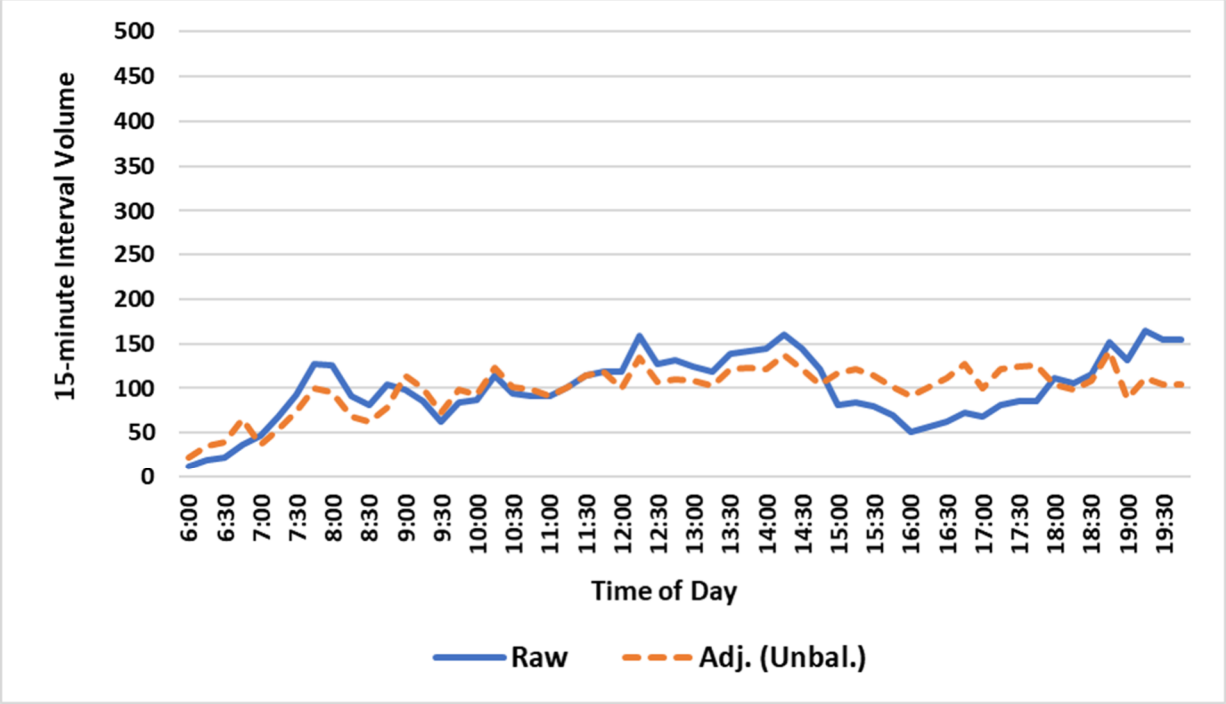
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-40 SR 85 Southbound On-Ramp at Saratoga Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



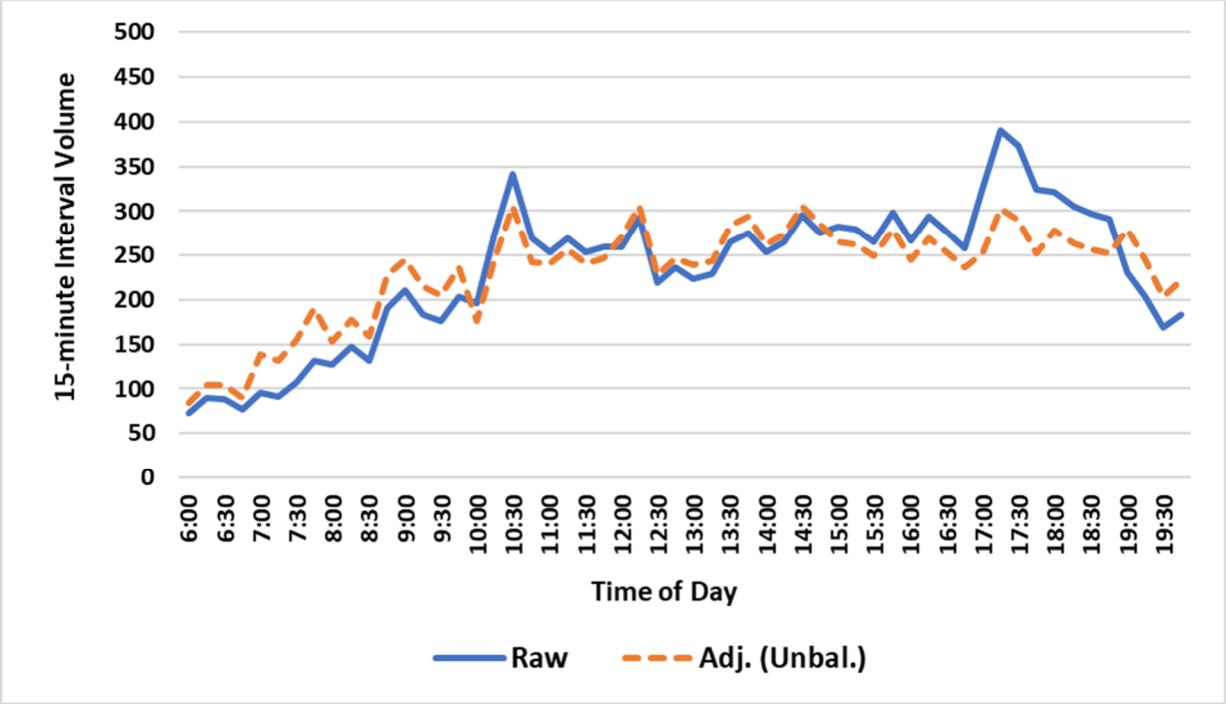
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-41 SR 85 Southbound Off-Ramp at Saratoga Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



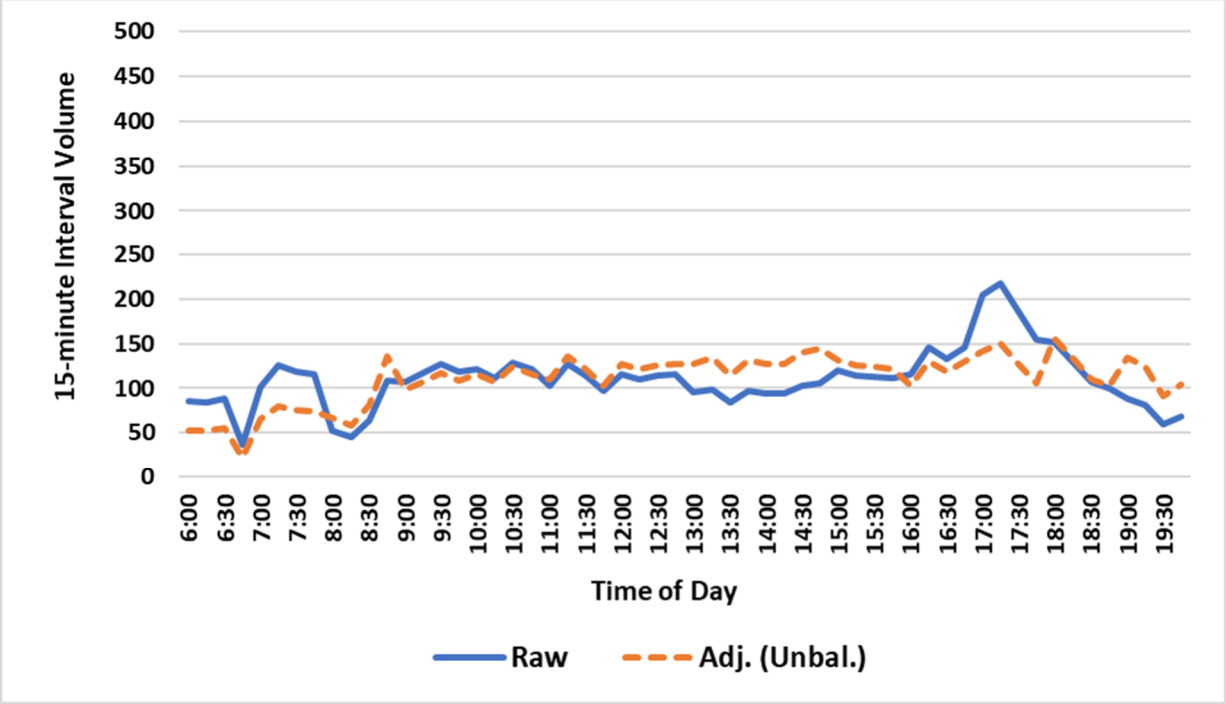
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-42 SR 85 Northbound Off-Ramp at Saratoga Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



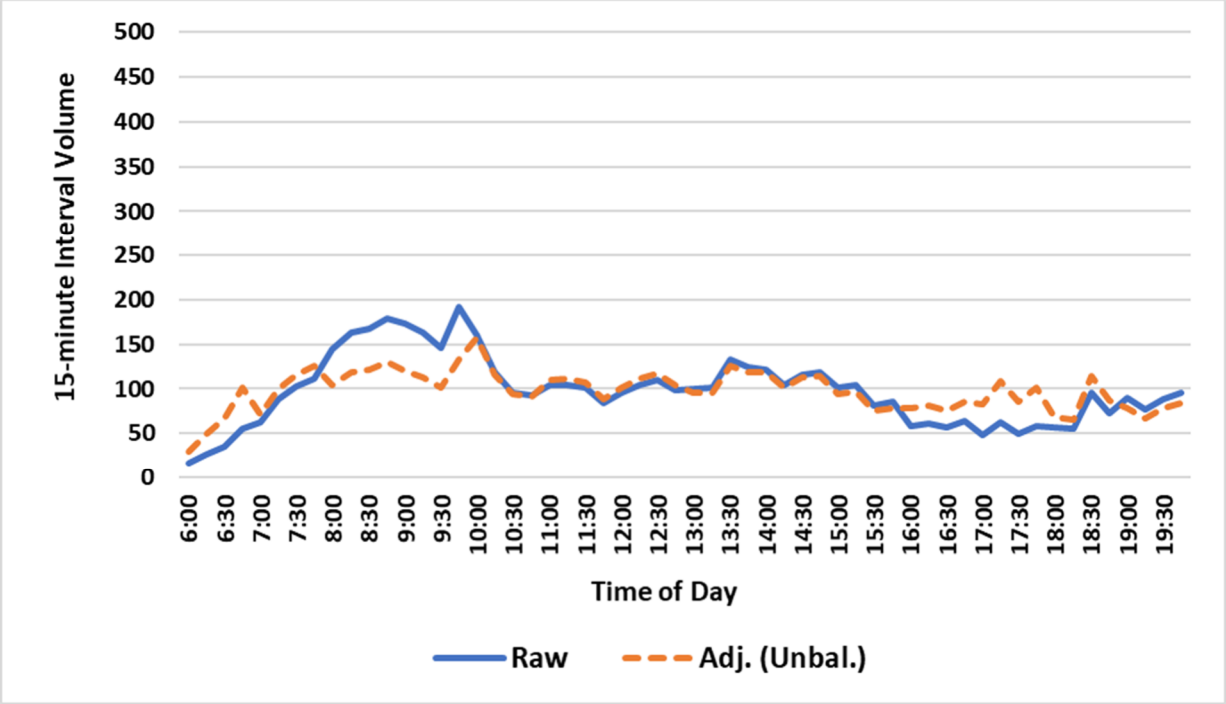
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-43 SR 85 Northbound On-Ramp at Winchester Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



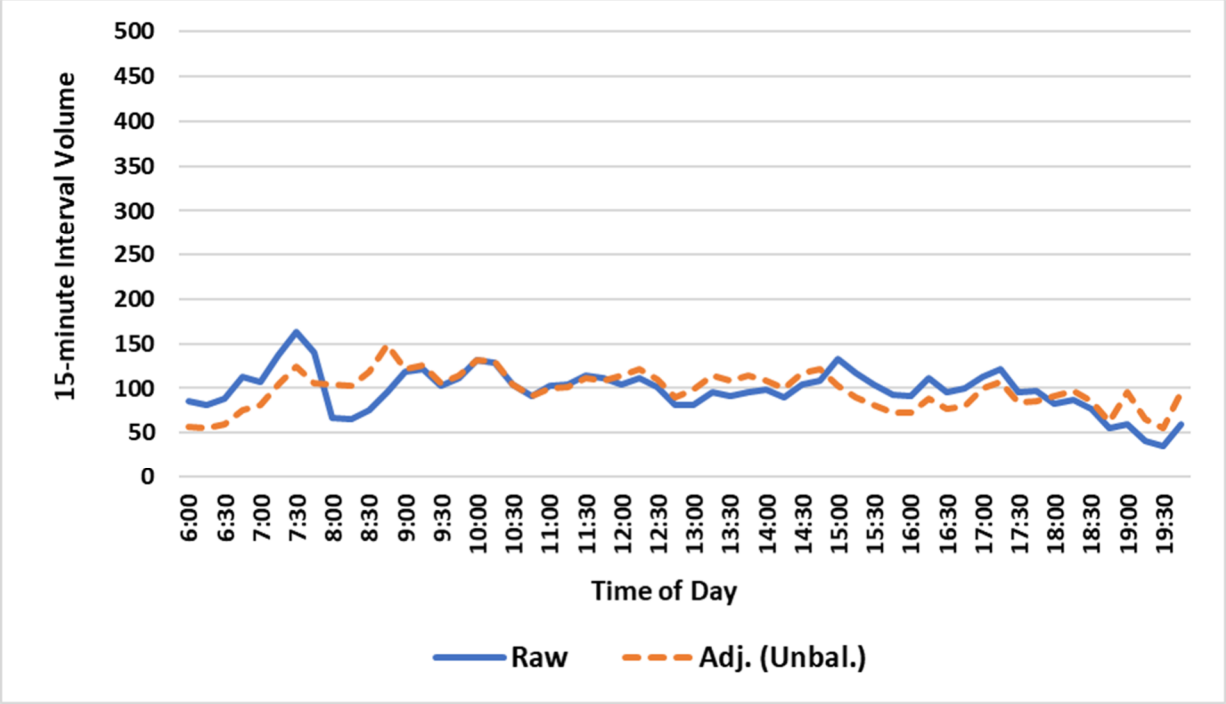
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-44 SR 85 Southbound Off-Ramp at Winchester Boulevard 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



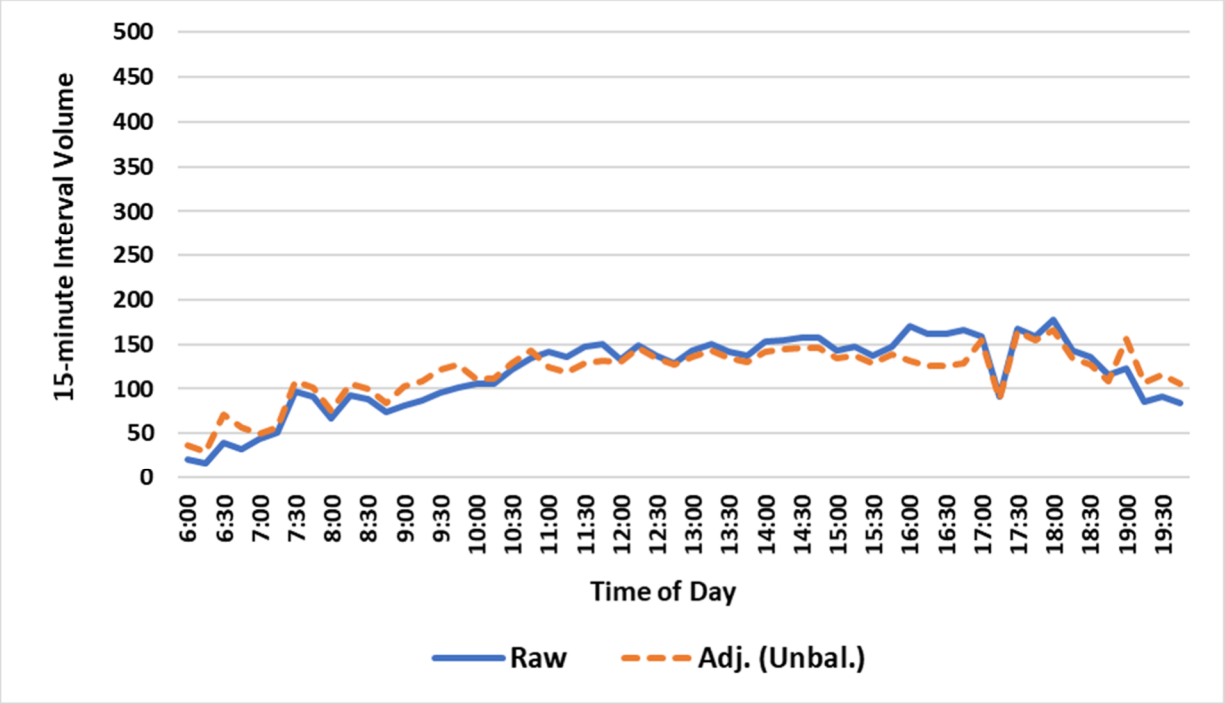
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-45 SR 85 Northbound On-Ramp at South Bascom Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



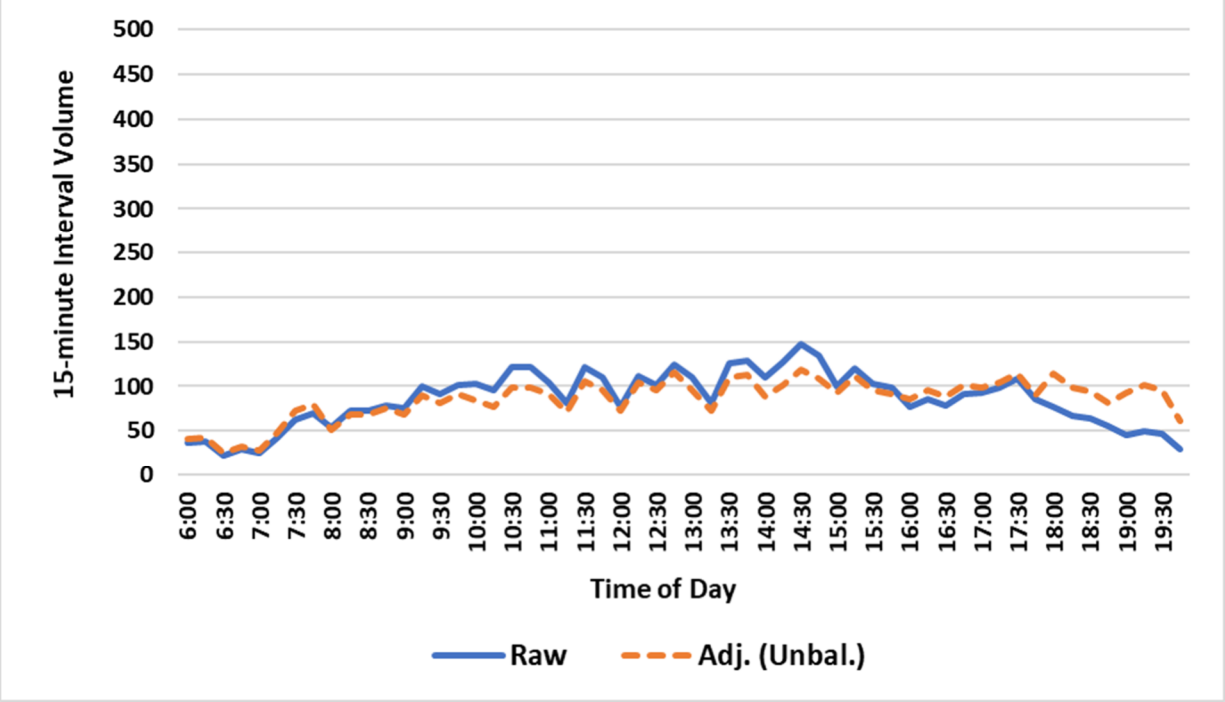
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-46 SR 85 Southbound On-Ramp at South Bascom Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



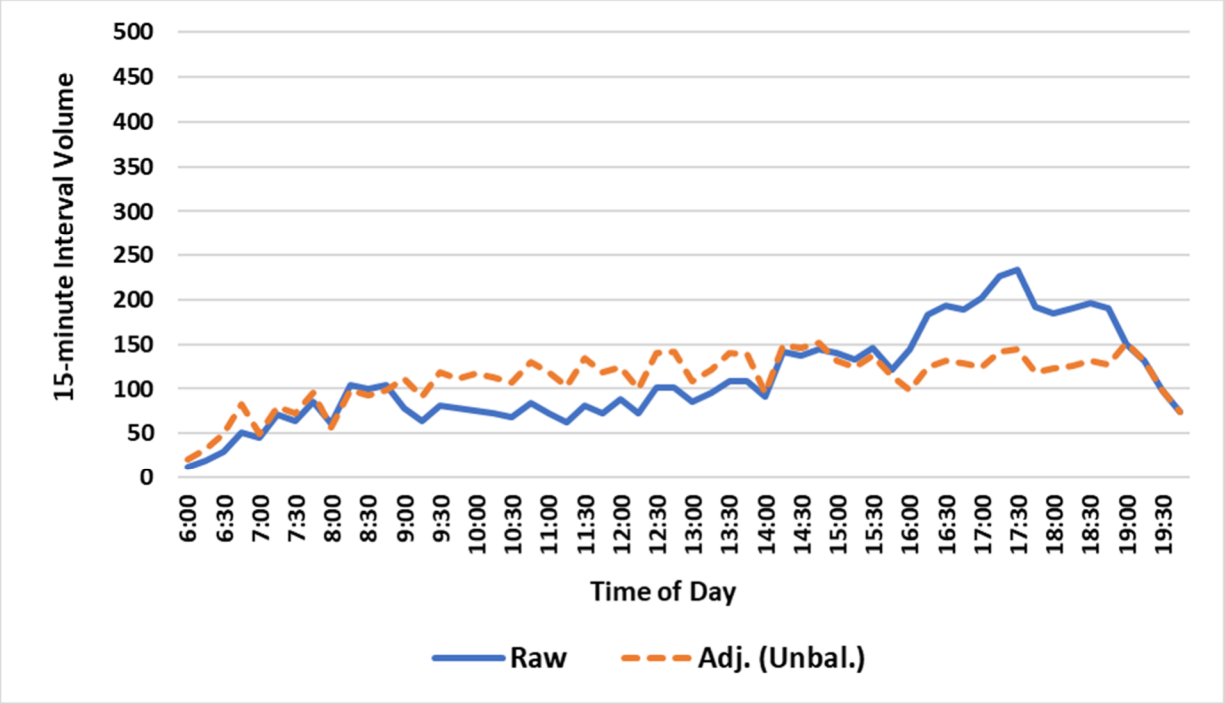
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-47 SR 85 Northbound Off-Ramp at South Bascom Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



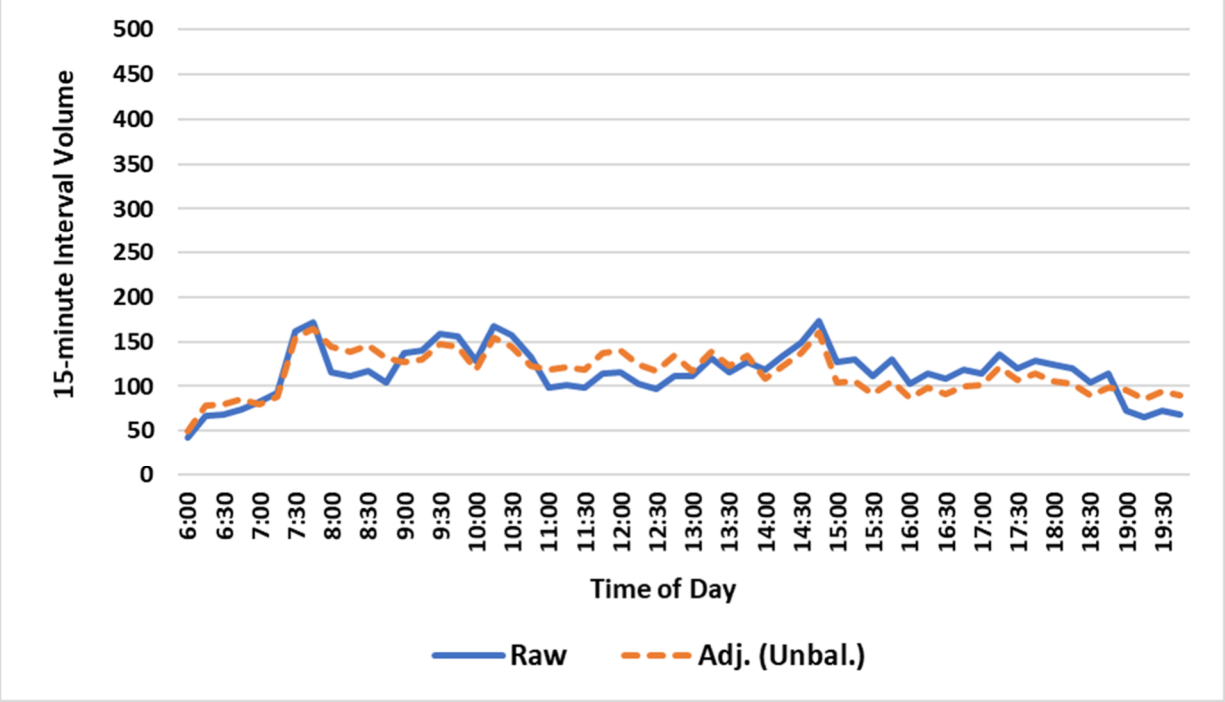
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-48 SR 85 Southbound Off-Ramp at South Bascom Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



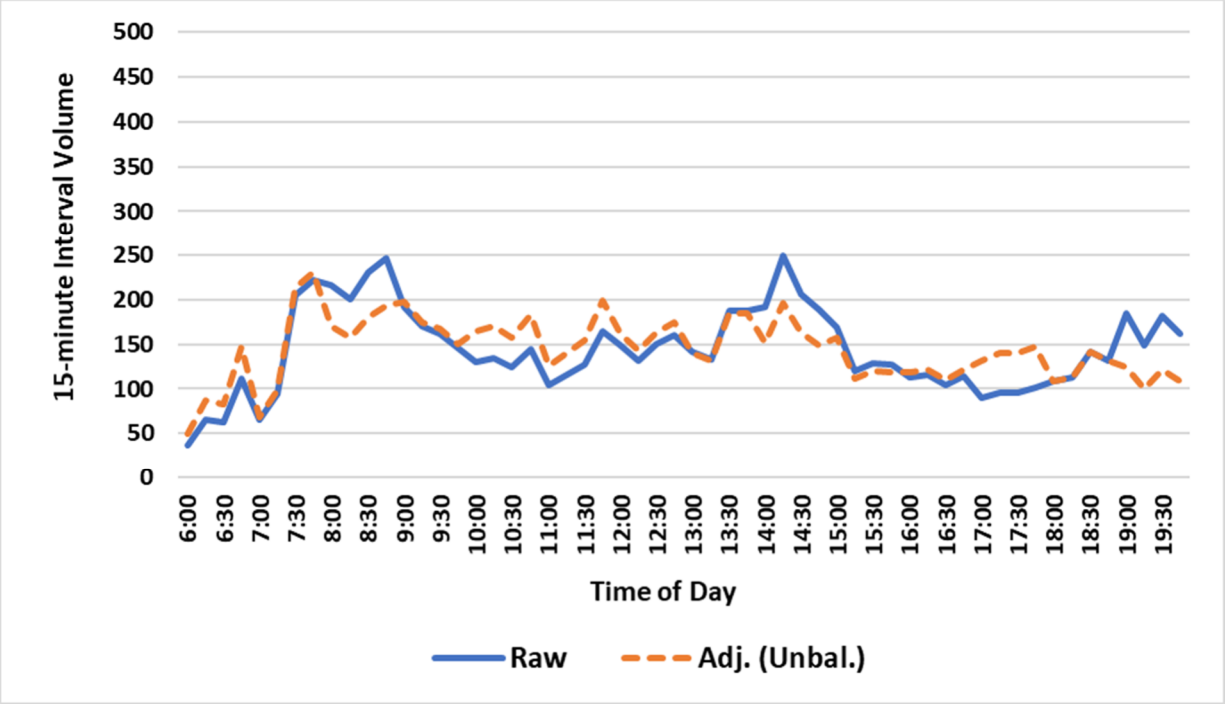
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-49 SR 85 Northbound Off-Ramp at Union Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



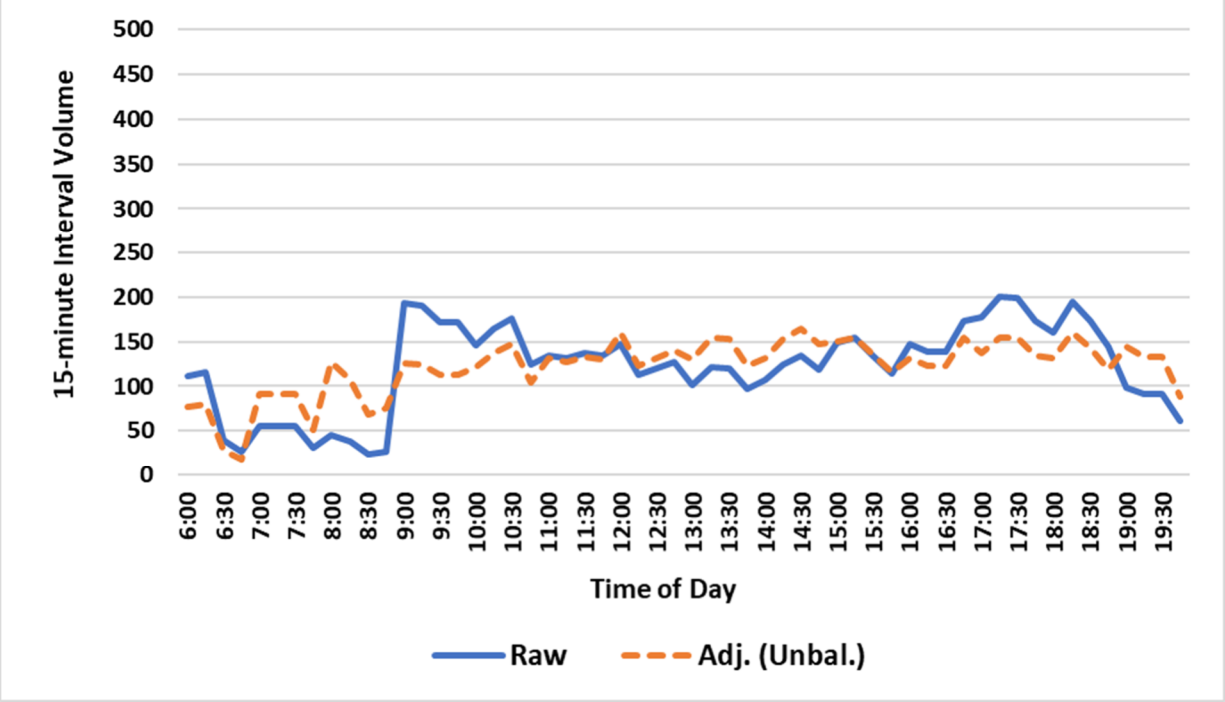
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-50 SR 85 Southbound Off-Ramp at Union Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



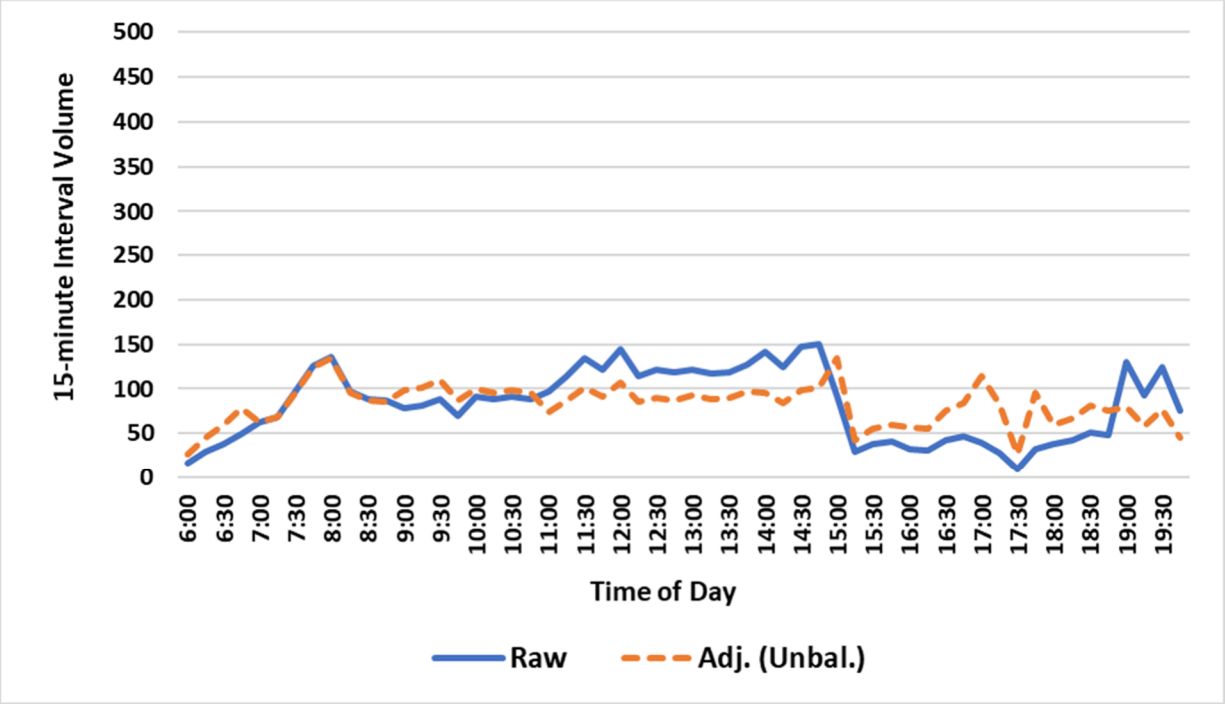
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-51 SR 85 Northbound On-Ramp at Union Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



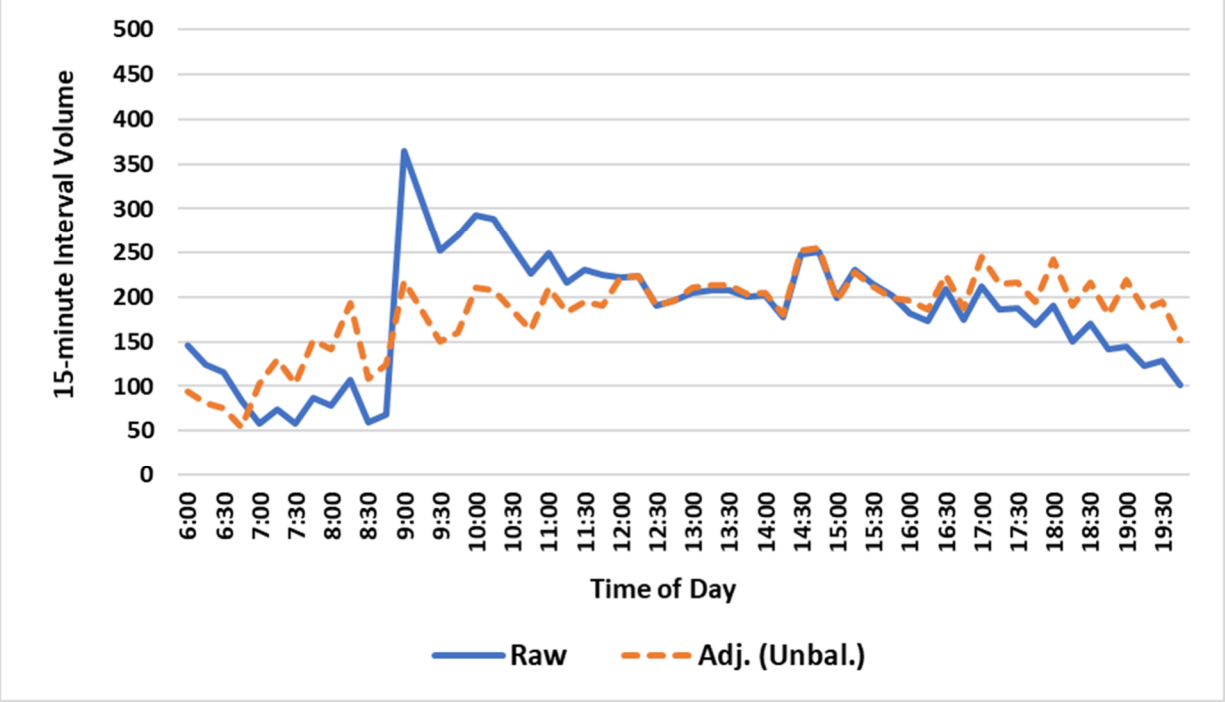
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-52 SR 85 Southbound On-Ramp at Union Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



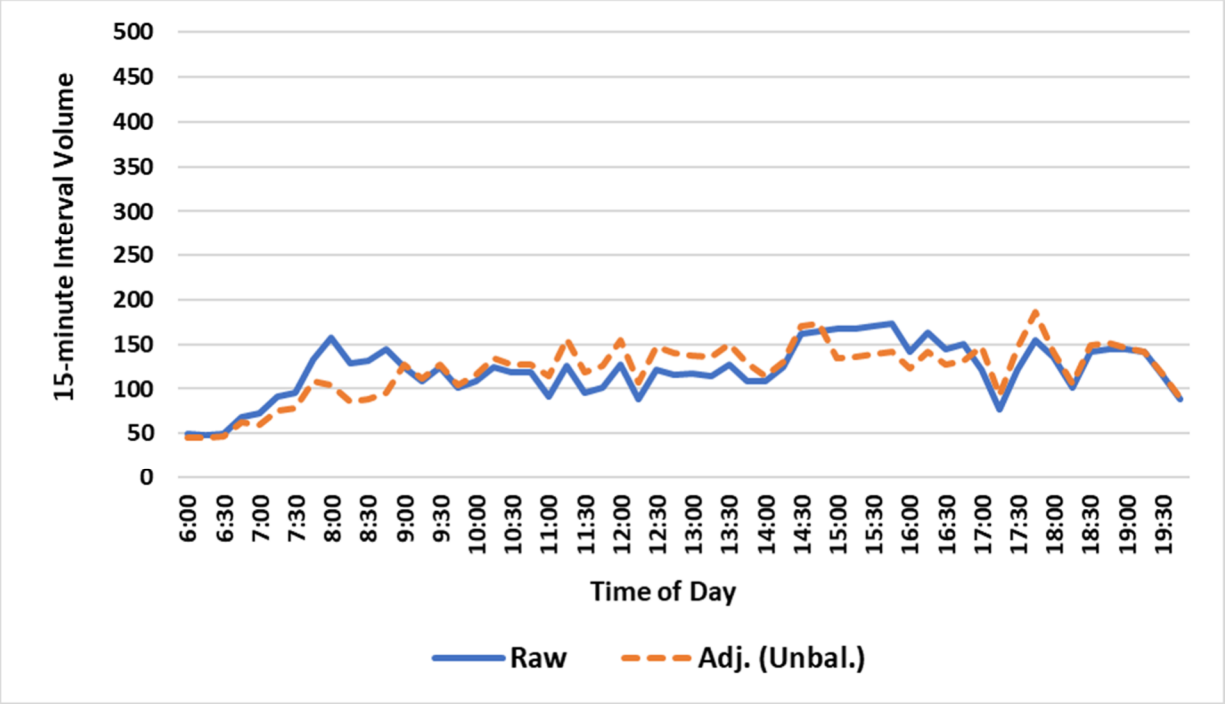
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-53 SR 85 Northbound On-Ramp at Camden Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



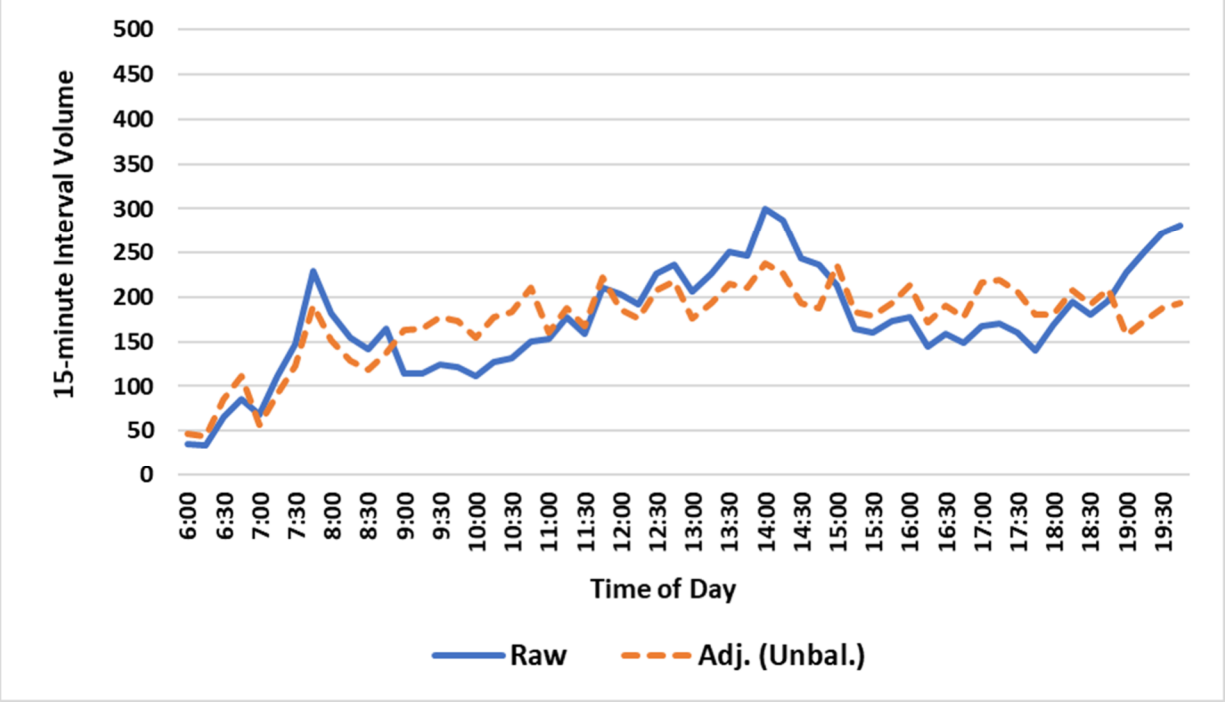
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-54 SR 85 Southbound On-Ramp at Camden Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



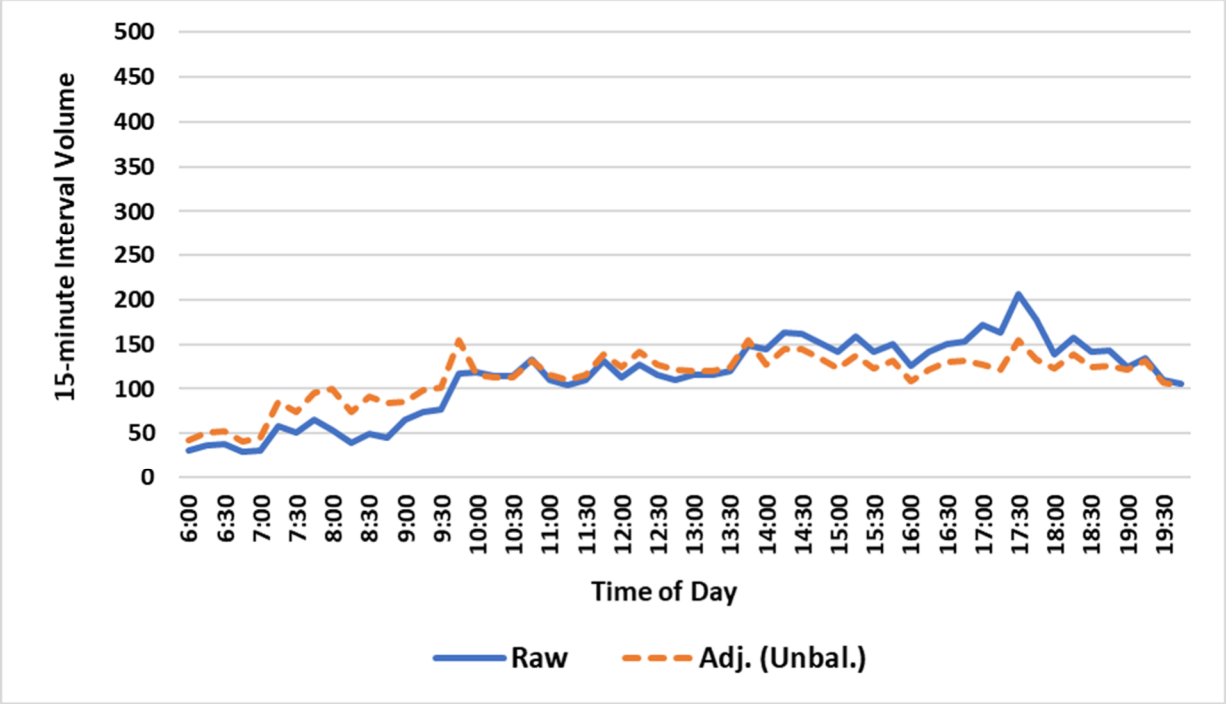
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-55 SR 85 Southbound Off-Ramp at Camden Avenue 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



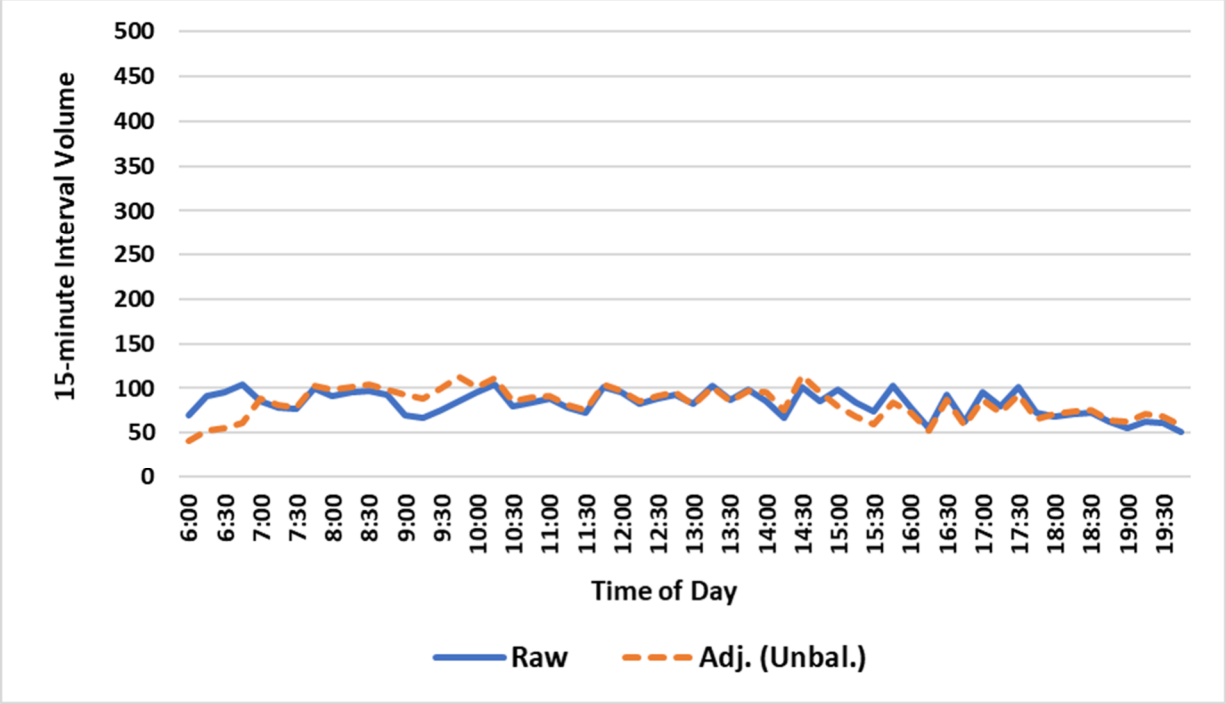
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-56 SR 85 Northbound Off-Ramp at Branham Lane 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



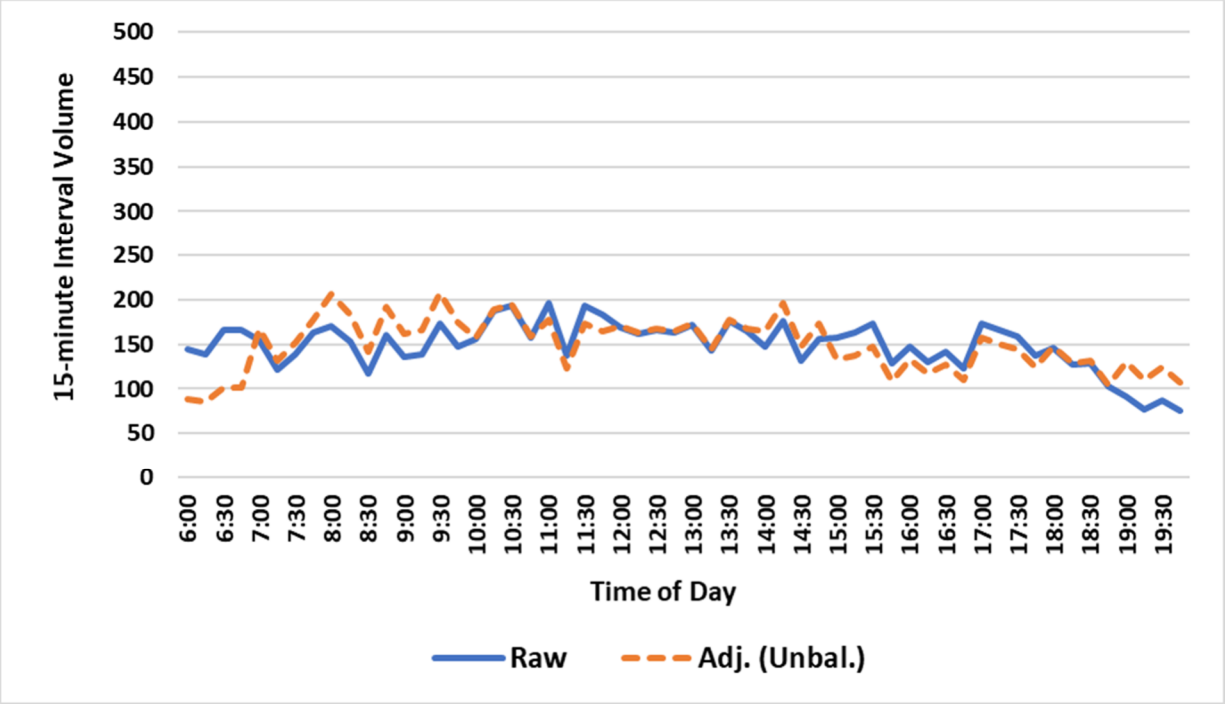
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-57 SR 85 Northbound On-Ramp at Southbound Almaden Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



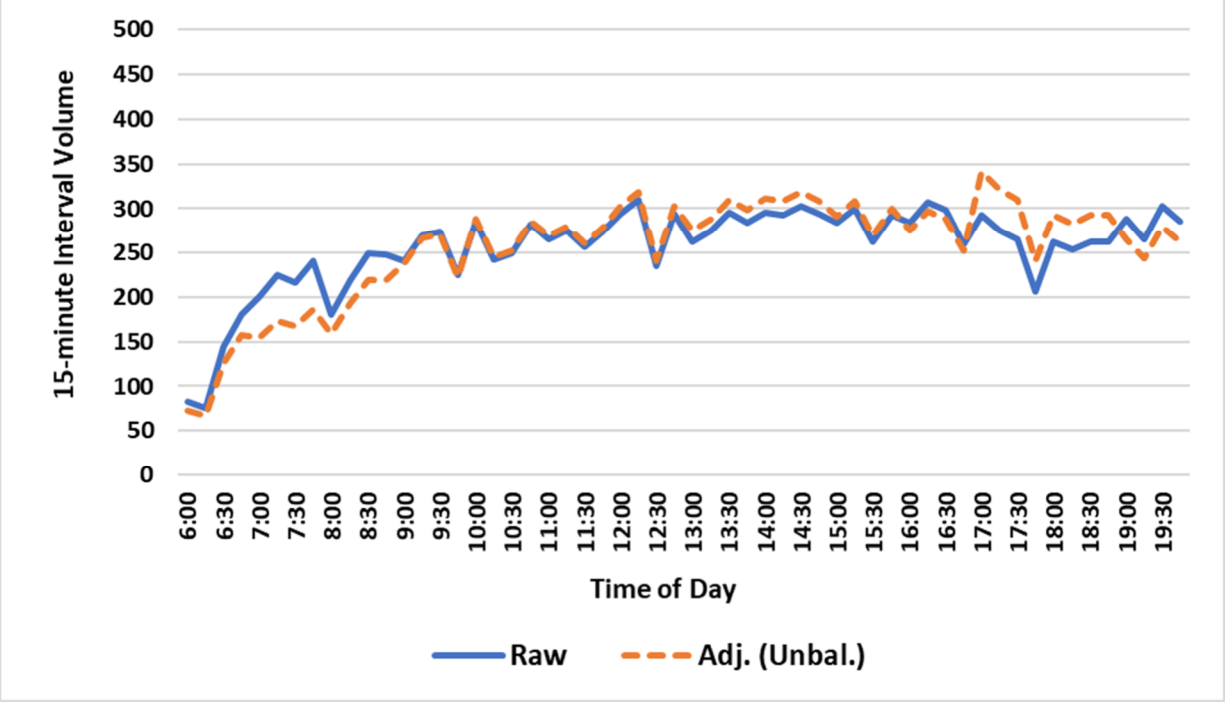
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-58 SR 85 Northbound On-Ramp at Northbound Almaden Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



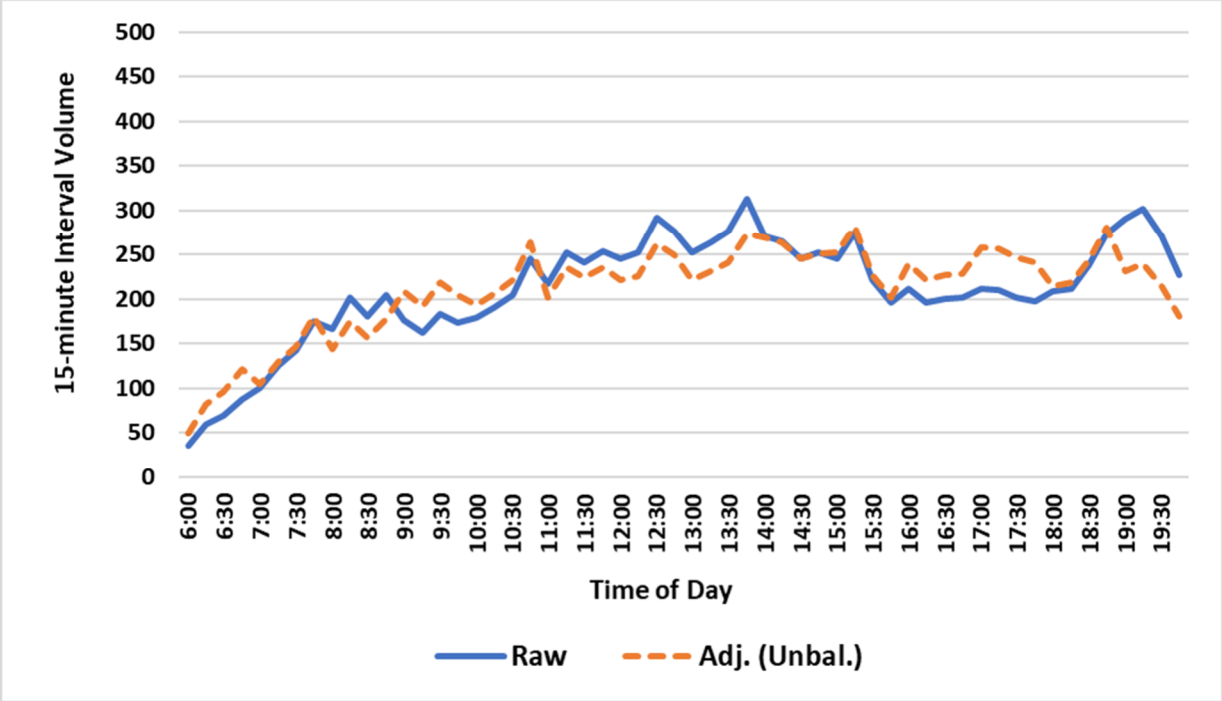
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-59 SR 85 Northbound Off-Ramp at Southbound Almaden Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



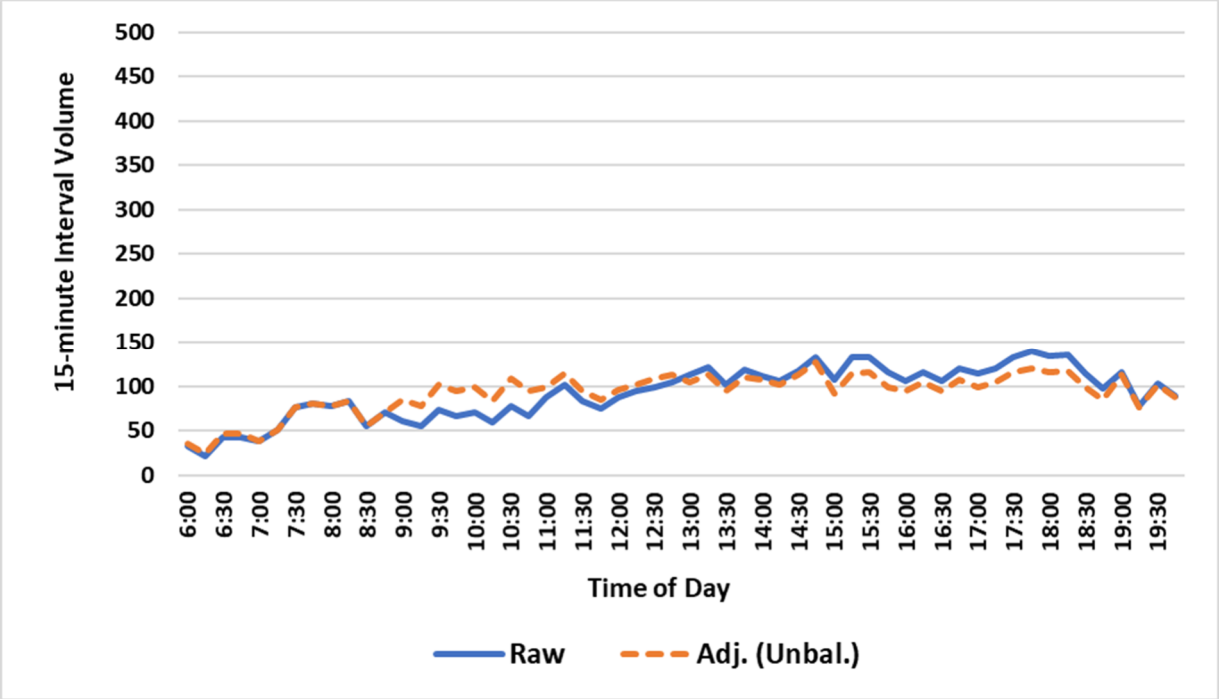
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-60 SR 85 Southbound Off-Ramp at Almaden Plaza Way 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



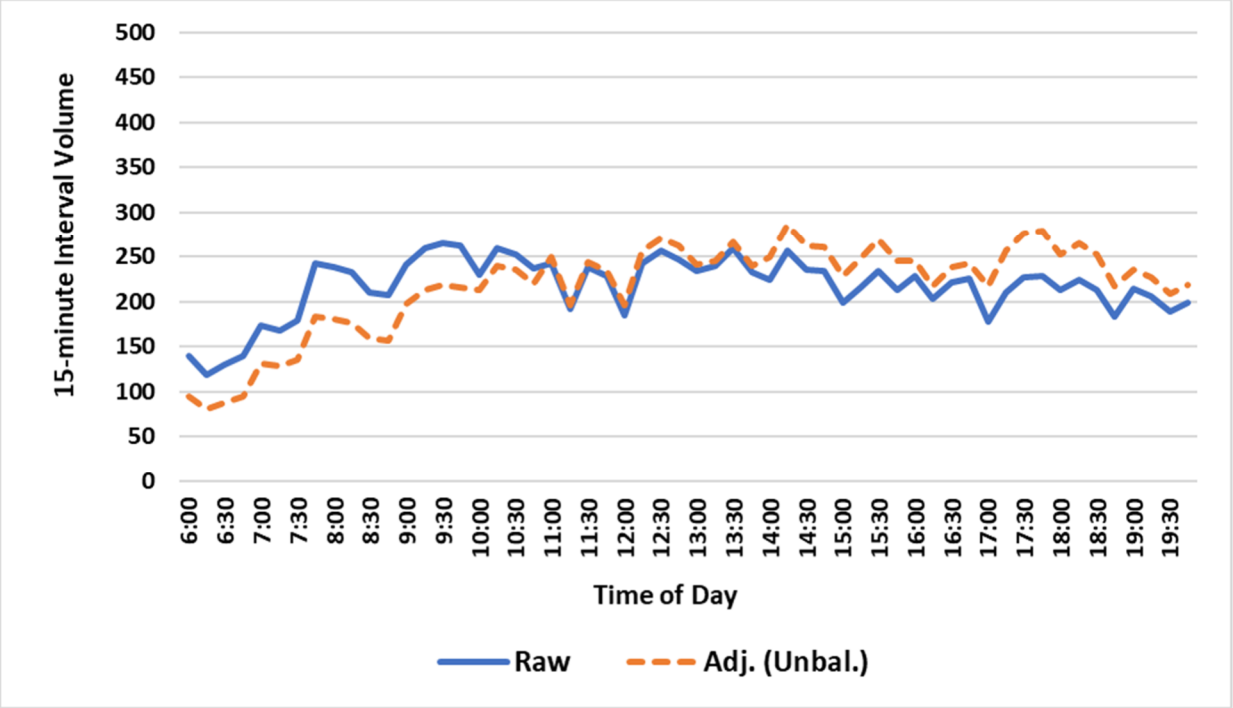
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-61 SR 85 Southbound On-Ramp at Southbound Almaden Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

Figure B-62 SR 85 Southbound On-Ramp at Northbound Almaden Expressway 15-minute Interval Raw Mainline Counts versus 15-minute Interval Adjusted (Unbalanced) Volume



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; CDM Smith Analysis.
Note: Adj. = Adjusted, Unbal. = Unbalanced.

B.2.3.4 Determining Ramp Volumes for Missing Count Locations

As noted previously, counts were not taken on freeway-to-freeway ramps along SR 85 corridor. However, hourly balanced flow volume estimates dated April 2019 for these ramps were available from the Phase 1 Report of this Study. These volume estimates were scaled up or down using proportionality factors derived from the February 2020 mainline unbalanced volume estimates and the April 2019 mainline balanced volume estimates. **Table B-5** shows the volume estimates made for ramps on the following interchanges: SR 85 at SR 237 (4 ramps in total for both directions); SR 85 at I-280 (6 ramps in total for both directions); and, SR 85 at 17 (4 ramps total for both directions).

Figures B-63 and **B-64** show the peak hour total volume information on ramp locations in the northbound and southbound directions, respectively, in a bar chart format. On SR 85 northbound, the average ramp volume in the AM peak hour is 491 vehicles/hour and in the PM peak hour it is 508 vehicles/hour. The maximum ramp volume in the AM peak hour is 835 vehicles/hour and in the PM peak hour is 1,215 vehicles/hour. On SR 85 southbound, the average ramp volume in the PM peak hour is 472 vehicles/hour and in the PM peak hour it is 545 vehicles/hour. The maximum ramp volume in the AM peak hour is 996 vehicles/hour and in the PM peak hour it is 1,029 vehicles/hour.

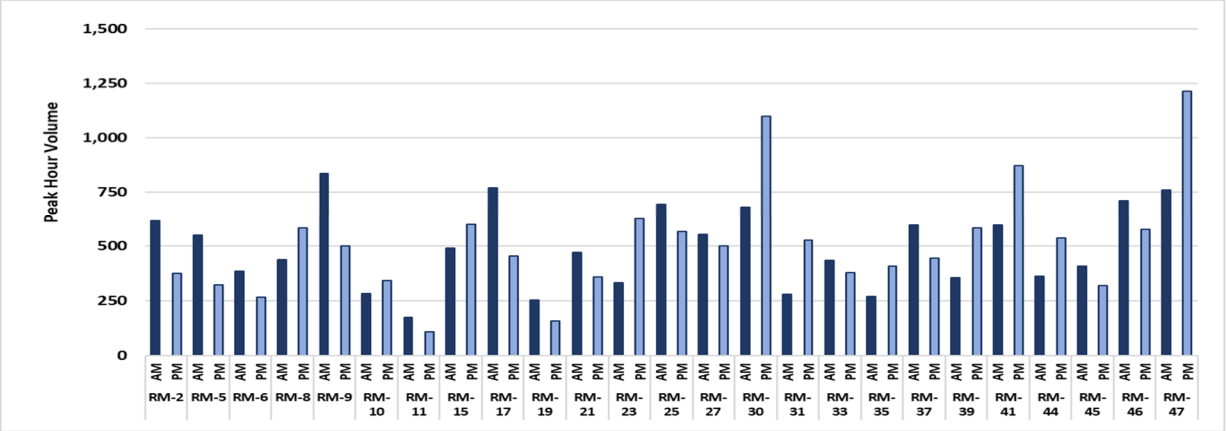
Table B-5 SR 85 AM and PM Peak Hour Ramp Volume Estimates for Missing Count Locations

Missing Count Location	Peak Hour	Apr 2019 Ramp Volume Estimate	Mainline Volumes based Adj. Factor	Feb 2020 Ramp Volume Estimate
SR 85 Northbound Off-Ramp at SR 17	AM	1,646	1.19	1,952
	PM	2,425	1.00	2,432
SR 85 Northbound On-Ramp at SR 17	AM	967	1.19	1,147
	PM	1,067	1.00	1,070
SR 85 Northbound Off-Ramp at I-280	AM	1,408	0.95	1,341
	PM	2,073	1.19	2,463
SR 85 Northbound On-Ramp at I-280 Southbound	AM	525	0.95	500
	PM	381	1.19	453
SR 85 Northbound On-Ramp at I-280 Northbound	AM	2,134	0.95	2,032
	PM	1,548	1.19	1,839
SR 85 Northbound Off-Ramp at SR 237	AM	1,362	1.19	1,625
	PM	988	0.74	736
SR 85 Northbound On-Ramp at SR 237	AM	273	1.19	326
	PM	198	0.75	148
SR 85 Southbound Off-Ramp at SR 237	AM	136	0.74	100
	PM	216	0.74	159
SR 85 Southbound On-Ramp at SR 237	AM	808	0.73	592
	PM	1,282	0.74	943
SR 85 Southbound Off-Ramp at I-280	AM	1,281	1.30	1,668
	PM	2,034	1.01	2,061
SR 85 Southbound On-Ramp at I-280	AM	313	1.30	408
	PM	497	1.01	504
SR 85 Southbound On-Ramp at I-280	AM	799	1.30	1,041
	PM	1,505	1.01	1,525
SR 85 Northbound Off-Ramp at SR 17	AM	591	1.27	748
	PM	938	0.94	885
SR 85 Northbound On-Ramp at SR 17	AM	411	1.27	520
	PM	774	0.94	730

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

Figure B-63 SR 85 Northbound AM and PM Peak Hour Unbalanced Volumes at Ramp Locations

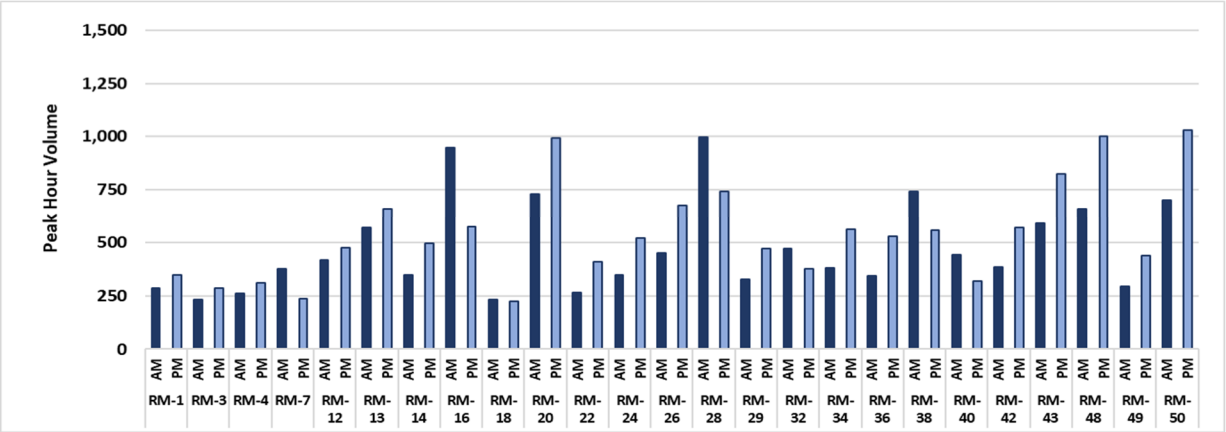


Loc ID	Loc Description	Loc ID	Loc Description	Loc ID	Loc Description	Loc ID	Loc Description
RM-2	SR 85 NB Off Ramp to Moffett Blvd	RM-15	SR 85 NB Off Ramp to W Fremont Ave	RM-30	SR 85 NB Off Ramp to Saratoga Ave	RM-44	SR 85 NB Off Ramp to Branham Ln
RM-5	SR 85 NB On Ramp from Central Expy	RM-17	SR 85 NB On Ramp from W Fremont Ave	RM-31	SR 85 NB On Ramp from Winchester Blvd	RM-45	SR 85 NB On Ramp from SB Almaden Expy
RM-6	SR 85 NB Off Ramp to Central Expy	RM-19	SR 85 NB On Ramp from Homestead Rd	RM-33	SR 85 NB On Ramp from S Bascom Ave	RM-46	SR 85 NB On Ramp from NB Almaden Expy
RM-8	SR 85 NB Off Ramp to WB El Camino Real	RM-21	SR 85 NB Off Ramp to Stevens Creek Blvd	RM-35	SR 85 NB Off Ramp to S Bascom Ave	RM-47	SR 85 NB Off Ramp to Almaden Expy
RM-9	SR 85 NB On Ramp from WB El Camino Real	RM-23	SR 85 NB On Ramp from S De Anza Blvd	RM-37	SR 85 NB Off Ramp to Union Ave		
RM-10	SR 85 NB Off Ramp to EB El Camino Real	RM-25	SR 85 NB Off Ramp to S De Anza Blvd	RM-39	SR 85 NB On Ramp from Union Ave		
RM-11	SR 85 NB On Ramp from EB El Camino Real	RM-27	SR 85 NB On Ramp from Saratoga Ave	RM-41	SR 85 NB On Ramp from Camden Ave		

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

Figure B-64 SR 85 Southbound AM and PM Peak Hour Unbalanced Volumes at Ramp Locations



Loc ID	Loc Description	Loc ID	Loc Description	Loc ID	Loc Description	Loc ID	Loc Description
RM-1	SR 85 SB On Ramp from Moffett Blvd	RM-16	SR 85 SB On Ramp from W Fremont Ave	RM-29	SR 85 SB Off Ramp to Saratoga Ave	RM-43	SR 85 SB Off Ramp to Camden Ave
RM-3	SR 85 SB Off Ramp to Central Expy	RM-18	SR 85 SB Off Ramp to Homestead Rd	RM-32	SR 85 SB Off Ramp to Winchester Blvd	RM-48	SR 85 SB Off Ramp to Almaden Plaza Way
RM-4	SR 85 SB On Ramp from Central Expy	RM-20	SR 85 SB Off Ramp to Stevens Creek Blvd	RM-34	SR 85 SB On Ramp from S Bascom Ave	RM-49	SR 85 SB On Ramp from SB Almaden Expy
RM-7	SR 85 SB On Ramp from WB El Camino Real	RM-22	SR 85 SB On Ramp from Stevens Creek Blvd	RM-36	SR 85 SB Off Ramp to S Bascom Ave	RM-50	SR 85 SB On Ramp from Almaden Expy
RM-12	SR 85 SB Off Ramp to EB El Camino Real	RM-24	SR 85 SB On Ramp from S De Anza Blvd	RM-38	SR 85 SB Off Ramp to Union Ave		
RM-13	SR 85 SB On Ramp from EB El Camino Real	RM-26	SR 85 SB Off Ramp to S De Anza Blvd	RM-40	SR 85 SB On Ramp from Union Ave		
RM-14	SR 85 SB Off Ramp to W Fremont Ave	RM-28	SR 85 SB On Ramp from Saratoga Ave	RM-42	SR 85 SB On Ramp from Camden Ave		

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Note: AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

B.2.3.5 Peak Hour Volume Balancing

Mainline and ramp peak hour volumes were combined by direction and rearranged in the order of traffic flow along the corridor from end to end (for the southbound - starting from north end and travelling to south end; for the northbound - starting from south end and travelling to north end). Starting with a known mainline peak hour volume of a segment, unknown upstream/downstream mainline peak hour volumes of adjacent segments was derived by adding or subtracting adjacent on-/off-ramp peak hour volumes from the known mainline volumes as one proceeds along the corridor in one direction. The known mainline volume was selected in such a manner that the mean square error between the balanced and unbalanced peak hour volumes at mainline count locations minimized. All balanced peak hour volumes are rounded up to the nearest multiple of 5. The volume balancing was conducted separately for SR 85 northbound AM peak hour, northbound PM peak hour, southbound AM peak hour and southbound PM peak hour. **Figure B-65** shows the straight-line diagrams for SR 85 northbound and southbound AM and PM peak hour balanced volumes. Peak hour volume balancing was extended to the vehicle classes (auto, bus and truck) and lane types (non-HOV and HOV) using the mainline and ramp counts as control values for the vehicle class and lane shares. These represented the estimated volumes for the no change alternative (1-1).

B.2.3.6 Peak Period 15-Minute Interval Volume Factors Estimation

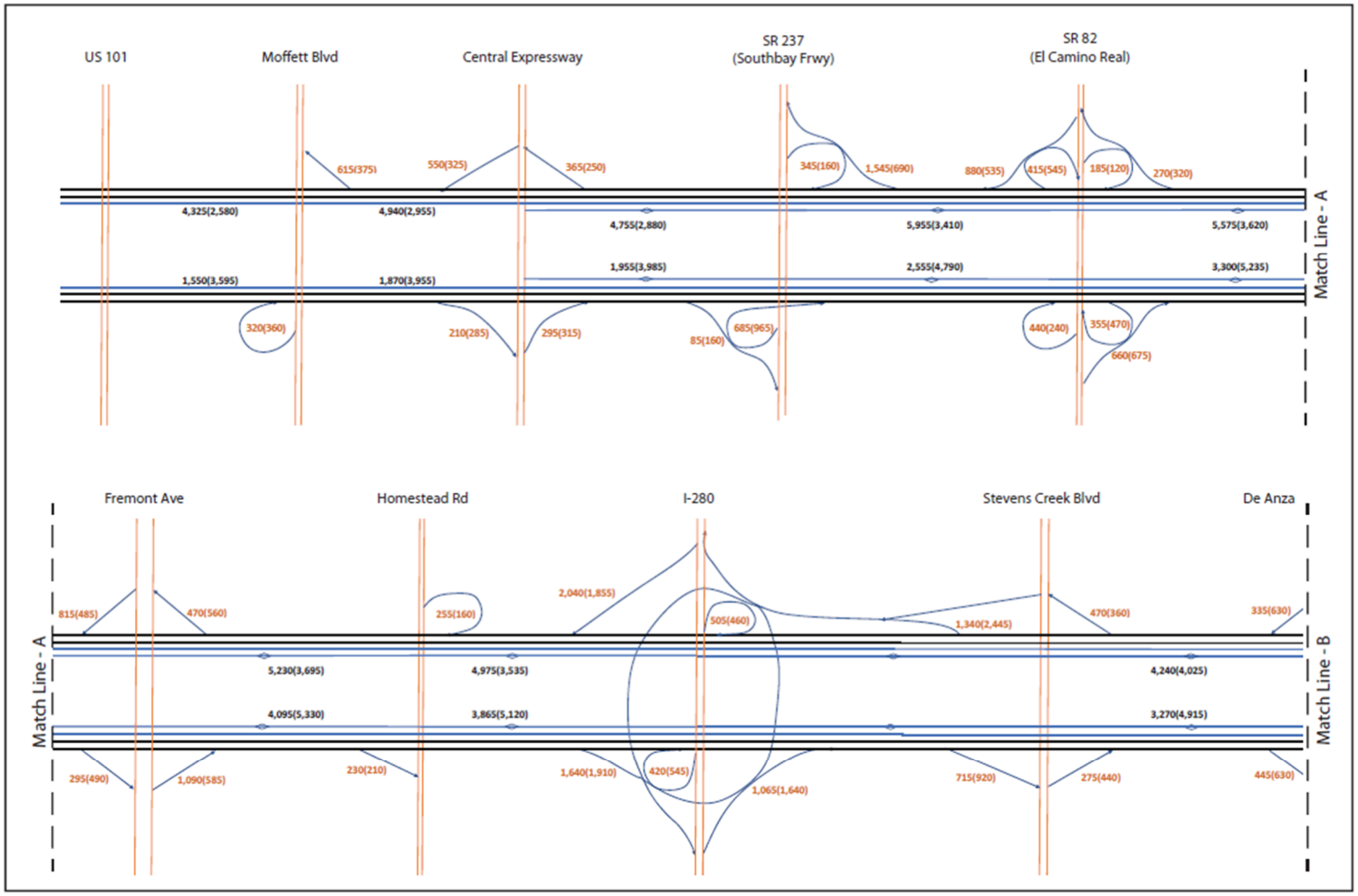
For the purposes of traffic operations modeling over the wider AM peak period (6 am to 12 pm) and PM peak period (2 pm to 8 pm), volume factors were determined based on the 15-minute interval combined total volumes at the four mainline data collection sites (see **Table B-6**). The volume factors were used to scale the balanced peak hour volume to the 15-minute intervals within the peak period.

Table B-6 15-minute Interval Volume Factors for the AM and PM Peak Periods

Time Interval	AM Peak Period Volume Factor	Time Interval	PM Peak Period Volume Factor
6:00 - 6:15 AM	0.67	2:00 - 2:15 PM	0.88
6:15 - 6:30 AM	0.74	2:15 - 2:30 PM	0.96
6:30 - 6:45 AM	0.75	2:30 - 2:45 PM	0.96
6:45 - 7:00 AM	0.81	2:45 - 3:00 PM	0.97
7:00 - 7:15 AM	0.83	3:00 - 3:15 PM	0.93
7:15 - 7:30 AM	0.90	3:15 - 3:30 PM	0.99
7:30 - 7:45 AM	0.93	3:30 - 3:45 PM	0.99
7:45 - 8:00 AM	1.00	3:45 - 4:00 PM	0.98
8:00 - 8:15 AM	0.98	4:00 - 4:15 PM	0.91
8:15 - 8:30 AM	1.00	4:15 - 4:30 PM	0.92
8:30 - 8:45 AM	1.00	4:30 - 4:45 PM	0.94
8:45 - 9:00 AM	1.00	4:45 - 5:00 PM	0.96
9:00 - 9:15 AM	0.97	5:00 - 5:15 PM	0.99
9:15 - 9:30 AM	0.99	5:15 - 5:30 PM	1.00
9:30 - 9:45 AM	1.00	5:30 - 5:45 PM	1.00
9:45 - 10:00 AM	1.00	5:45 - 6:00 PM	0.96
10:00 - 10:15 AM	0.98	6:00 - 6:15 PM	0.94
10:15 - 10:30 AM	0.98	6:15 - 6:30 PM	0.95
10:30 - 10:45 AM	0.93	6:30 - 6:45 PM	0.85
10:45 - 11:00 AM	0.92	6:45 - 7:00 PM	0.88
11:00 - 11:15 AM	0.84	7:00 - 7:15 PM	0.83
11:15 - 11:30 AM	0.84	7:15 - 7:30 PM	0.77
11:30 - 11:45 AM	0.83	7:30 - 7:45 PM	0.76
11:45 AM - 12:00 PM	0.83	7:45 - 8:00 PM	0.73

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts; CDM Smith Analysis

Figure B-65 SR 85 Northbound and Southbound AM and PM Peak Hour Balanced Volume Straight Line Diagrams



LEGEND

Peak Hour Volumes

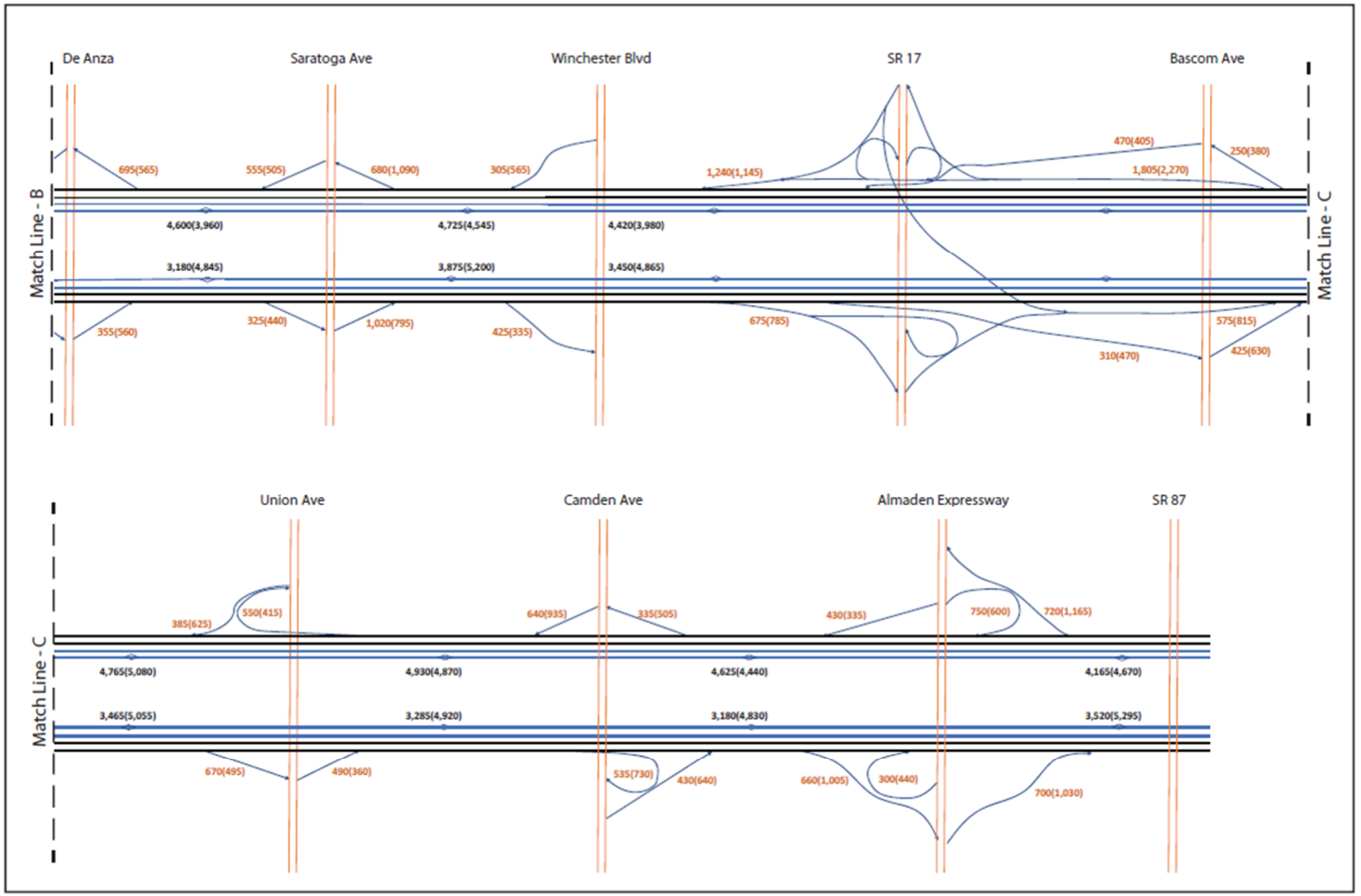
xxxx(xxxx) AM(PM) Mainline

yyy(yyy) AM(PM) Ramp

NOT TO SCALE

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

Figure B-65 SR 85 Northbound and Southbound AM and PM Peak Hour Balanced Volume Straight Line Diagrams (Continued)



LEGEND

Peak Hour Volumes

xxxx(xxxx) AM(PM) Mainline

yyy(yyy) AM(PM) Ramp

NOT TO SCALE

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis.

B.2.3.7 HOV Occupancy and Clean Air Vehicle Decal (CAV Decal) Surveys Summary

Occupancy counts and clean air vehicle decal[5] (CAV decal) counts were collected through manual observations at two locations along SR 85, these were Homestead Road overcrossing and Meridian Avenue overcrossing over a 2-hour AM peak period (7 am to 9 am) and a 2-hour PM peak period (4 pm to 6 pm).

The occupancy counts suffer from several observer limitations:

- Did not include buses, bikes, or cars in which the observer could not see in due to front windshield tint.
- Counts represent only those persons that were observed. Much of the time it was difficult to see the persons in the back seat due to factors including, tint, speed of the vehicle and angle of the sun.
- Cars that operate as fleet for Transportation Network Companies (TNCs) such as Uber/Lyft likely have people in the back seat but no one except the driver in the front seat. So, double occupancy vehicles also may be higher than that counted.

For the above reasons, the raw counts represent car occupancy alone and should be treated as a survey sample rather than a full count. Also, there are most likely more 2, 3 and 4-person occupancy autos than the raw reported numbers.

There are no reportable data limitations with the CAV decal counts, as the decals are posted on the outside of the vehicle and visible to the observer under most conditions. However, in the case of CAV decal count in the northbound AM peak period on SR 85 at Homestead Road overcrossing, the percentage of CAV decal vehicles was observed to be very low (4.2 percent) compared to other locations, directions and time periods (ranged between 19-29 percent). Hence, the CAV decal survey for the northbound AM peak period on SR 85 at Homestead Road overcrossing was discarded as an outlier.

To overcome the raw occupancy data limitations and issues, the following assumptions and adjustments on occupancy were made:

- Many of the single occupancy vehicles (SOVs) on an HOV lane are likely also vehicles with decals for clean air vehicles (CAVs). So, the actual number of SOV vehicles in violation of the high occupancy rule may be lower than the total raw SOV count.
- According to the Caltrans HOV guidelines[6], the California Highway Patrol (CHP) is responsible for HOV lane enforcement. The goal is to keep HOV violation rates to less than 10 percent (of total HOV count). Once monitor counts detect violation rates above 10 percent, District personnel will notify local area CHP of the need for heightened enforcement in an HOV corridor.

[5] The California Department of Motor Vehicles (DMV) issues Clean Air Vehicle (CAV) decals that allow vehicles meeting specified emissions standards single occupancy use of High Occupancy Vehicle (HOV or carpool) lanes. California Air Resources Board (CARB) establishes the official list of eligible vehicles based upon vehicle emissions.

[6] https://dot.ca.gov/programs/traffic-operations/hov (last accessed on May 11, 2020)

According to the 2017 California HOV Facilities Degradations Report and Action Plan[7], several freeway corridors in the state are noted as having high HOV violation rates but SR 85 is not one of them. For this reason, it is assumed that the HOV violation rates are 10 percent or lower on average on SR 85.

While California Highway Patrol (CHP) staff enforce the HOV occupancy rule, the Metropolitan Transportation Commission (MTC) and the Bay Area Toll Authority (BATA) are seeking a video detection technology-based smartphone application to verify vehicle occupancy in express lanes and/or high-occupancy vehicle (HOV) lanes[8]. Currently, reliable technology to aid enforcement is not available system-wide.

In the particular case of the SR 85 at Homestead Road overcrossing count location, the traffic count was taken on February 4, 2020 (Tuesday) and CAV decal and occupancy counts were taken on February 5, 2020 (Wednesday), consecutive midweek days. The estimation of the percentage share of SOV or the count of vehicles with unknown occupancy by combining the data from the different dates was considered to be reasonable based on an engineering judgment that fluctuations in the total HOV count during AM and PM peak periods between the consecutive midweek days is expected to be small.

Based on all of the above, the percentage share of SOVs was adjusted to percent of decals plus 10 percent. This adjustment resulted in a drop of SOV share of the total HOV count compared to the raw data.

Total vehicle count on the HOV lane over the 2-hour AM and PM peak periods minus the total raw occupancy counts was considered to be the count of vehicles with unknown occupancy.

The difference between total vehicle count and SOV count on the HOV lane was allocated to HOV 2 and HOV 3+ vehicle types as an 80:20 ratio based on engineering judgment.

Tables B-7 shows a summary of the raw and adjusted occupancy and clean air vehicle (CAV or decal) surveys taken on HOV. The adjusted estimates of SOV share are in the range of 29 to 39 percent of the total HOV count. The adjusted estimates of HOV 2 share are in the range of 49 percent to 57 percent, HOV 3+ share are in the range of 12 percent to 14 percent, and the average vehicle occupancy (AVO) is in the range of 1.73 to 1.85 (assuming triple occupancy for HOV 3+, although it could be slightly higher). The existing CAV decal shares are in the range of 19 to 29 percent. These represent the estimated occupancy and CAV decal shares of the estimated HOV volume (see **Section B.2.3.5**) under the no change alternative (1-1).

It is noted that most manual methods for collecting occupancy counts would suffer from similar issues to the HOV lane occupancy surveys conducted in this study. However, comparisons were made between the occupancy raw data/adjusted estimates to that found in operational HOV to Express Lanes conversion projects and proposals.

[7] 2017 California HOV Facilities Degradations Report and Action Plan, available at: https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/f0019528-2017_hov_degradation_report_action_plan-a11y.pdf (last accessed on May 11, 2020)

[8] https://www.mercurynews.com/2019/07/28/how-videos-apps-and-good-ol-fashioned-policing-are-catching-carpool-lane-cheaters-in-the-bay-area/ (last accessed on May 11, 2020)

The results were compared to the before conditions on operational I-580, I-680 and I-110 Express Lane projects[9,10]. On I-580 and I-110, the occupancy prior to Express Lanes were between 1.21 to 1.57; on I-680 before SOV share was in the range of 27 to 35 percent. While I-580 and I-110 before conditions were closer to the raw occupancy estimates, I-680 before conditions were closer to our adjusted occupancy estimates.

The results were also compared with no build data or models on the proposed US 101 and I-105 Express Lane project applications[11,12,13]. The occupancy surveys on US 101 were conducted between South of Whipple Avenue and North of I-380 which does not have existing HOV lanes. The surveys showed HOV 2 share of 15 to 17 percent and HOV 3+ share of 1 to 2 percent in the peak periods. Since, SR 85 has existing HOV lanes, the differences in the vehicle type shares between US 101 data against both SR 85 raw vehicle type shares and adjusted vehicle type shares are reasonable. I-105 in LA Metro region, on the other hand, has similar existing conditions to SR 85. I-105 under no build conditions, which includes a single lane HOV 2+ facility, has a SOV share in the range of 10 to 15 percent, HOV 2 share of 72 to 76 percent and HOV 3+ share 13 percent during AM and PM peak periods. This is close to the adjusted occupancy estimate for SR 85 in terms of HOV 3+ share; but somewhat different in terms of SOV and HOV 2 shares.

Given that SR 85 adjusted occupancy estimates are based on sound engineering judgment and are consistent with at least some of the existing and proposed HOV to Express Lane conversion projects (I-680, I-110 and I-105), the occupancy adjustments were retained.

[9] https://www.alamedactc.org/wp-content/uploads/2018/12/580_Express_Lanes_After_Study_FINAL.pdf (last accessed on May 11, 2020)

[10] https://www.alamedactc.org/wp-content/uploads/2018/11/AlamedaCTC_I-680_After_Study_20130712-1.pdf (last accessed on May 11, 2020)

[11] https://ccag.ca.gov/wp-content/uploads/2019/07/SM101HOTLane_CTCApplication_TollFacility_V07.pdf (last accessed on May 11, 2020)

[12] https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2019/2019-09/metro-i105-express-lanes-application.pdf

[13] https://ccag.ca.gov/wp-content/uploads/2014/05/US-101-HOV-Hybrid-PSR-PDS-Complete-Signed-Approved-2015-05-04.pdf (last accessed on May 11, 2020)

Table B-7 SR 85 HOV Facility CAV Decal and Occupancy Counts for AM and PM Peak Periods – Raw versus Adjusted

Dir.	Time Period	Count Type	Vehicle Type	Raw Data				Adjusted Estimate				Estimated Average Vehicle Occupancy (AVO)
				SR 85 at Homestead Road (ML-1) Count	SR 85 at Meridian Avenue (ML-2) Count	Aggregate	% Share of TOTAL	SR 85 at Homestead Road (ML-1) Count	SR 85 at Meridian Avenue (ML-2) Count	Aggregate	% Share of TOTAL	
NB	**AM**	**CAV Decal**	Decal	110	700	**810**	**14%**	Not Used	700	**700**	**23%**	
			Non-Decal	2,509	2,356	**4,865**	**86%**	Not Used	2,356	**2,356**	**77%**	
			TOTAL	**2,619**	**3,056**	**5,675**	**100%**	**Not Used**	**3,056**	**3,056**	**100%**	
		Occ.	SOV	1,903	1,441	**3,344**	**59%**	862	1,006	**1,867**	**33%**	
			HOV 2	627	1,147	**1,774**	**31%**	1,406	1,640	**3,046**	**54%**	
			HOV 3+	4	37	**41**	**1%**	351	410	**762**	**13%**	
			Unknown	85	431	**516**	**9%**					
			TOTAL	**2,619**	**3,056**	**5,675**	**100%**	**2,619**	**3,056**	**5,675**	**100%**	**1.81**
NB	**PM**	**CAV Decal**	Decal	149	202	**351**	**19%**	149	202	**351**	**19%**	
			Non-Decal	397	1,123	**1,520**	**81%**	397	1,123	**1,520**	**81%**	
			TOTAL	**546**	**1,325**	**1,871**	**100%**	**546**	**1,325**	**1,871**	**100%**	
		Occ.	SOV	244	320	**564**	**30%**	157	381	**538**	**29%**	
			HOV 2	251	515	**766**	**41%**	311	755	**1,066**	**57%**	
			HOV 3+	13	5	**18**	**1%**	78	189	**267**	**14%**	
			Unknown	38	485	**523**	**28%**					
			TOTAL	**546**	**1,325**	**1,871**	**100%**	**546**	**1,325**	**1,871**	**100%**	**1.85**
SB	**AM**	**CAV Decal**	Decal	195	174	**369**	**29%**	195	174	**369**	**29%**	
			Non-Decal	399	509	**908**	**71%**	399	509	**908**	**71%**	
			TOTAL	**594**	**683**	**1,277**	**100%**	**594**	**683**	**1,277**	**100%**	
		Occ.	SOV	274	401	**675**	**53%**	231	266	**497**	**39%**	
			HOV 2	243	213	**456**	**36%**	290	334	**624**	**49%**	
			HOV 3+	23	6	**29**	**2%**	73	83	**156**	**12%**	
			Unknown	54	63	**117**	**9%**					
			TOTAL	**594**	**683**	**1,277**	**100%**	**594**	**683**	**1,277**	**100%**	**1.73**
SB	**PM**	**CAV Decal**	Decal	621	689	**1,310**	**25%**	621	689	**1,310**	**25%**	
			Non-Decal	1,455	2,444	**3,899**	**75%**	1,455	2,444	**3,899**	**75%**	
			TOTAL	**2,076**	**3,133**	**5,209**	**100%**	**2,076**	**3,133**	**5,209**	**100%**	
		Occ.	SOV	1,122	1,260	**2,382**	**46%**	730	1,101	**1,831**	**35%**	
			HOV 2	689	1,687	**2,376**	**46%**	1,077	1,625	**2,702**	**52%**	
			HOV 3+	6	8	**14**	**0%**	269	406	**676**	**13%**	
			Unknown	259	178	**437**	**8%**					
			TOTAL	**2,076**	**3,133**	**5,209**	**100%**	**2,076**	**3,133**	**5,209**	**100%**	**1.78**

Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts; CDM Smith Analysis

Note: AM Peak Period = 7 am to 9 am, PM Peak Period = 4 pm to 6 pm.

B.3 Traffic Speed Data Collection/Processing

B.3.1 Freeway Mainline Speed Data

Traffic speed data on the mainline along the SR 85 were collected and processed as follows:

Caltrans PeMS Hourly Average Speeds Data were collected for the month of February 2020 on midweek days (Tuesdays, Wednesdays and Thursdays) from 6 am to 8 pm using Caltrans PeMS Detector Station data. Segments were identified based on the SR 85 Transit Guideway Study Phase 1 Report. An average of the hourly average speeds from multiple detector stations over a given segment was used as the average segment speed. Not all data collected at detector stations may be actual observations, data imputation is used in Caltrans PeMS when there is missing observed data. In this data collection, only the detector stations with "percent observed" data greater than or equal to 67 percent were used. As a result, speed data was not used for two segments in SR 85 northbound direction (Saratoga Ave to Winchester Blvd and Union Ave to Camden Ave) and one segment in SR 85 southbound direction (Homestead Rd to I-280). This data was used to calibrate the speeds in the traffic operations model used to assess change in speed.

Google Maps Traffic Model Hourly Average Speed data were collected for a midweek day in 2020[14] from 6 am to 8 pm using Google Maps' "DistanceMatrix" Application Programming Interface (API). Average speed estimates at the start of each hour were derived from Google Maps "best guess" (average) travel time predictions on the same segments as identified in the SR 85 Transit Guideway Study Phase 1 Report.

INRIX 50th Percentile Hourly Average Speeds were collected from the SR 85 Transit Guideway Study Phase 1 Report. These represent the 50th percentile value for each hour from 6 am to 8 pm computed over the average speeds for that hour across all midweek days from September 2016 to August 2017. Average speed for each hour and day were computed by using all INRIX records in that hour and day. The Phase 1Report defined segments over which the speed data was aggregated.

Figures B-66 to **B-68** are showing the hourly speeds information using the above three data sources. The congestion patterns are similar between the different sources. The magnitudes of speeds in the 2016/2017 INRIX data during the congested hours and locations however are higher compared to the 2020 Caltrans PeMS and Google Maps data indicating speed conditions on SR 85 have worsened over time. The data also shows that although congestion starts as isolated bottlenecks, they quickly expand and become compound bottlenecks with overlapping extents on SR 85.

[14] Google Maps "DistanceMatrix" API uses historical travel times to predict travel times for a "future date". The analysis was originally conducted in mid-February 2020 and revised in early April 2020 to meet a corridor segmentation requirement. The April 2020 analysis used as the "future date" of April 29, 2020 (Wednesday) for travel time predictions. However, it is noted that the prediction does not consider the advent of stay home California and SF Bay Area coronavirus / COVID-19 stay home orders of 2020; the speed estimates derived from the Google Maps travel time predictions are comparable to Caltrans PeMS speeds data in February 2020.

In this traffic analysis, the Caltrans PeMS speed data, which was available for most freeway segment locations, was used as a reference speed for model calibration under existing conditions. To fill some holes in the PeMS data between Saratoga Ave to Winchester Blvd and Union Ave to Camden Ave segments in the northbound direction and Homestead Rd to I-280 in the southbound direction, the Google Maps speed data was used in the model calibration.

Figure B-66 SR 85 Hourly Average Speeds based on Caltrans PeMS February 2020 Midweek 6 am to 8 pm Data

Northbound Freeway Segments

Mountain View ← San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	62	60	61	60	60	61	64	64	50	57	N.A.	41	47	N.A.	40	55
7:00 AM	57	60	57	51	48	53	40	60	30	33	N.A.	23	35	N.A.	21	40
8:00 AM	46	52	50	30	30	39	15	42	37	35	N.A.	27	36	N.A.	20	30
9:00 AM	43	48	48	28	29	39	17	36	47	50	N.A.	26	35	N.A.	26	41
10:00 AM	61	58	56	43	45	52	41	58	57	62	N.A.	40	43	N.A.	57	64
11:00 AM	68	61	63	60	60	61	64	68	65	66	N.A.	65	62	N.A.	64	65
12:00 PM	68	64	64	61	62	63	66	68	66	67	N.A.	67	64	N.A.	64	65
1:00 PM	68	66	65	61	62	64	67	68	66	67	N.A.	67	64	N.A.	64	65
2:00 PM	68	66	66	62	63	63	67	68	66	67	N.A.	67	63	N.A.	64	65
3:00 PM	68	65	65	61	62	63	66	67	66	66	N.A.	66	62	N.A.	64	64
4:00 PM	68	64	64	61	63	63	66	67	66	66	N.A.	66	64	N.A.	64	64
5:00 PM	68	64	63	61	63	62	65	68	66	66	N.A.	66	62	N.A.	58	62
6:00 PM	67	64	61	58	62	62	65	68	65	65	N.A.	65	62	N.A.	63	62
7:00 PM	67	67	66	62	63	64	67	69	67	67	N.A.	67	65	N.A.	66	65

Southbound Freeway Segments

Mountain View → San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	67	65	67	65	66	65	N.A.	68	68	67	67	69	67	66	67	67
7:00 AM	67	65	67	63	60	58	N.A.	67	68	67	67	68	67	65	66	67
8:00 AM	65	63	67	63	60	56	N.A.	66	69	66	66	66	67	63	64	66
9:00 AM	66	63	67	65	62	58	N.A.	66	68	67	67	66	67	64	65	66
10:00 AM	67	67	68	66	62	59	N.A.	66	68	66	67	67	68	64	65	66
11:00 AM	67	67	67	65	60	58	N.A.	66	68	66	67	67	68	64	65	65
12:00 PM	66	66	67	66	58	58	N.A.	67	68	66	67	67	68	64	65	65
1:00 PM	67	66	64	63	58	57	N.A.	67	68	66	66	66	67	63	62	63
2:00 PM	64	54	42	41	43	45	N.A.	65	56	54	45	65	55	41	56	61
3:00 PM	62	58	44	35	35	37	N.A.	52	13	27	25	63	42	29	43	58
4:00 PM	56	52	40	34	35	36	N.A.	39	9	20	23	51	29	26	31	55
5:00 PM	46	34	25	28	33	36	N.A.	39	9	20	21	33	21	24	29	49
6:00 PM	51	50	35	30	31	34	N.A.	47	17	24	21	35	20	23	31	50
7:00 PM	61	55	53	43	44	45	N.A.	62	45	49	41	60	48	33	54	60

Source: Caltrans PeMS Detector Stations Speed Data; CDM Smith's Analysis

Legend

Green	Greater than 55 mph
Yellow	45 to 55 mph
Orange	35 to 45 mph
Red	Less than 35 mph

Figure B-67 SR 85 "Best Guess" Hourly Speeds based on Google Maps Traffic Model 2020 Midweek 6 am to 8 pm Estimates

Northbound Freeway Segments

Mountain View ← San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	71	74	72	76	71	74	75	76	68	69	66	74	66	68	69	70
7:00 AM	68	67	66	66	62	55	67	67	39	33	32	20	38	26	24	24
8:00 AM	62	64	58	40	36	26	18	59	45	31	24	13	29	28	25	20
9:00 AM	62	64	54	28	25	18	10	20	35	44	35	26	46	30	30	39
10:00 AM	68	65	58	34	31	26	34	71	65	67	43	28	49	45	60	65
11:00 AM	68	71	66	63	66	67	72	76	68	72	67	75	68	70	71	65
12:00 PM	71	71	66	69	69	70	72	76	70	72	71	75	68	71	71	65
1:00 PM	71	71	66	69	69	70	72	76	70	72	72	75	69	71	71	65
2:00 PM	71	71	69	72	69	70	71	76	70	72	71	75	69	71	71	65
3:00 PM	71	71	66	72	69	69	71	71	69	72	71	75	68	71	70	65
4:00 PM	68	69	66	63	68	69	69	76	69	71	70	75	68	71	69	65
5:00 PM	68	67	66	63	67	66	69	71	68	70	68	74	68	68	68	62
6:00 PM	68	67	63	63	64	54	68	71	66	67	60	71	65	66	67	60
7:00 PM	68	67	63	63	67	66	68	71	68	71	69	74	68	70	69	65

Southbound Freeway Segments

Mountain View → San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	66	66	64	62	66	68	67	68	74	72	72	77	74	74	74	69
7:00 AM	66	66	66	61	66	67	67	68	73	72	72	77	73	73	71	64
8:00 AM	66	66	64	61	63	65	67	70	73	70	70	77	73	71	71	66
9:00 AM	66	66	64	61	64	65	67	67	72	70	69	73	73	71	71	67
10:00 AM	66	66	66	62	66	67	67	67	73	71	71	77	74	73	72	67
11:00 AM	66	66	66	62	66	67	67	68	73	72	71	77	73	72	71	67
12:00 PM	66	66	66	62	66	67	67	71	73	72	71	77	73	72	71	66
1:00 PM	66	66	66	62	66	66	67	70	73	71	71	77	73	72	71	66
2:00 PM	66	66	66	62	63	66	67	70	73	70	70	77	73	69	69	66
3:00 PM	66	45	24	20	33	34	63	63	30	35	41	68	29	38	65	64
4:00 PM	66	60	47	30	37	38	63	25	15	26	38	65	26	35	53	61
5:00 PM	44	34	22	21	35	38	59	20	13	20	30	29	14	32	49	59
6:00 PM	31	23	17	17	28	37	59	27	13	17	22	21	13	30	43	58
7:00 PM	66	60	58	42	43	46	59	51	25	31	36	46	21	33	58	61

Source: Google Maps "DistanceMatrix" Application Programming Interface; CDM Smith's Analysis

Legend

Green	Greater than 55 mph
Yellow	45 to 55 mph
Orange	35 to 45 mph
Red	Less than 35 mph

Figure B-68 SR 85 50th Percentile Hourly Average Speeds based on INRIX 2016/2017 Midweek 6 am to 8 pm Estimates

Northbound Freeway Segments

Mountain View ← San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	66	70	70	68	69	70	71	74	68	68	64	64	68	63	64	66
7:00 AM	56	70	69	66	65	64	68	70	58	43	40	22	27	32	28	23
8:00 AM	39	66	66	58	48	34	32	63	55	39	30	16	15	26	28	27
9:00 AM	51	66	65	45	29	20	12	34	50	49	38	17	23	31	34	56
10:00 AM	60	68	68	53	38	34	42	70	65	67	43	25	57	47	64	67
11:00 AM	62	70	70	66	67	68	70	74	69	70	68	72	70	68	69	68
12:00 PM	63	70	70	66	68	69	70	70	70	71	70	72	70	68	69	68
1:00 PM	63	70	70	68	68	68	70	70	70	71	70	72	70	68	69	68
2:00 PM	63	70	70	68	68	68	70	70	70	71	70	72	70	69	69	68
3:00 PM	64	70	69	66	68	68	70	70	69	71	69	72	70	68	68	67
4:00 PM	63	68	68	66	68	68	69	70	69	71	69	72	70	69	68	68
5:00 PM	61	68	69	68	68	68	70	70	69	70	68	72	70	68	68	67
6:00 PM	61	68	69	66	67	66	69	70	69	70	67	72	69	68	67	66
7:00 PM	62	68	68	66	68	68	68	70	69	70	69	72	70	68	69	67

Southbound Freeway Segments

Mountain View → San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	59	65	65	66	62	65	65	68	69	69	70	67	69	70	69	69
7:00 AM	60	65	65	66	61	66	65	69	71	70	71	70	70	70	70	68
8:00 AM	59	64	65	64	61	64	64	68	71	70	69	71	70	69	69	67
9:00 AM	59	66	68	66	65	67	65	67	72	71	70	72	70	70	69	68
10:00 AM	60	66	66	66	65	68	67	69	71	71	71	71	71	70	70	68
11:00 AM	60	66	66	66	64	67	66	69	71	70	70	71	70	70	70	68
12:00 PM	60	66	66	66	64	67	66	69	71	70	70	71	70	69	69	68
1:00 PM	60	66	66	66	65	67	66	69	71	70	70	71	70	69	69	68
2:00 PM	60	66	66	66	62	65	65	69	71	69	69	71	70	68	69	69
3:00 PM	59	65	62	44	35	37	51	52	37	39	50	48	32	51	65	67
4:00 PM	58	64	61	50	45	43	53	23	24	31	48	45	31	48	59	64
5:00 PM	51	40	30	26	31	37	50	19	19	27	40	25	23	44	56	62
6:00 PM	46	28	24	23	28	32	46	23	20	26	36	20	21	43	54	52
7:00 PM	56	63	60	47	41	43	51	57	39	47	47	51	32	51	64	67

Source: SR 85 Transit Guideway Study Phase 1 Report - September 2016 to August 2017 Midweek INRIX Speeds Data; CDM Smith's Analysis

Legend	
Green	Greater than 55 mph
Yellow	45 to 55 mph
Orange	35 to 45 mph
Red	Less than 35 mph

B.3.2 HOV Facility Speed related Degradation Information

The 2017 California HOV Facilities Degradations Report and Action Plan notes that peak period recurrent congestion on SR 85 in all lanes reduces HOV lane performance and speed and the demand exceeds HOV lane capacity on this corridor. In 2017, the SR 85 southbound HOV facility

between CA Postmile 9.590 (SR 85 just north of Union Ave) and R 23.800 (SR 85 - US 101 junction in the north) in Santa Clara County was determined as "extremely degraded" while the SR 85 northbound HOV facility between CA Postmile 4.795 (SR 85 just south of SR 87) and R 23.800 (SR 85 - US 101 junction in the north) in Santa Clara County was determined as "very degraded". The SR 85 southbound HOV facility between CA Postmile 4.795 (SR 85 just south of SR 87) and 9.590 (SR 85 just north of Union Ave) in Santa Clara County was also determined as "slightly degraded" in 2017.[15] Based on the freeway mainline speed data, which showed lowering of speeds between 2017 and 2020, the HOV facility speed would have also worsened.

B.4 Traffic Modeling

B.4.1 Model Overview and Purpose

A spreadsheet-based sketch planning traffic operations model was developed to estimate speeds under the Alternative 1-1 No Build and to estimate changes in volumes and speeds due to eight (8) build alternatives including: 2-1 HOV to Express Lane Conversion; 2-2 Short Dual Express Lane; 2-3 Long Dual Express Lane; 3-1 Short Median Transit Lane; 3-2 Long Median Transit Lane; 3-3 Right Side Median Transit Lane; 4-1 Median Bus on Shoulder; and, 4-2 Right Side Bus on Shoulder. In addition to the transit lane alternatives (3-1, 3-2, 3-3) and the bus on shoulder alternatives (4-1 and 4-2) there are also two routing options. These are on-corridor transit stations, and off-corridor existing transit stops. This brings the total count of traffic analysis results evaluated using the model to 14.

The modeling results of the no build alternative (1-1) were used in the transit operations analysis (see **Appendix E**), ridership estimation (see **Appendix A** of this report), as well as, the special case analysis of El Camino Real improvement (see **Section B.5** of this report). The results of the ridership estimation were used as a single feedback loop in the traffic analysis of the transit alternatives (3-1, 3-2, 3-3, 4-1 and 4-2) and two routing options to estimate the traffic impacts of the mode shift from auto to transit.

The output performance measures for the alternatives analysis are discussed in **Section B.6** of this report.

[15] As per Caltrans:
"Degradation" means either the morning or evening peak hour average speed is less than 45 mph. This is determined using Caltrans PeMS speeds on weekdays during AM peak hour of 8 am to 9 am and PM peak hour of 5 pm to 6 pm on HOV facility segments that are approximately five miles in length.
"Slightly degraded" means degradation occurs from 10 to 49 percent of the time, or three to nine weekdays per month.
"Very Degraded" means degradation occurs from 50 to 74 percent of the time, or ten to 15 weekdays per month.
"Extremely Degraded" means degradation occurs 75 percent or more of the time, or 16 or more weekdays per month.
Further definitions and information can be found in the 2017 California HOV Facilities Degradations Report and Action Plan, available at: https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/f0019528-2017_hov_degradation_report_action_plan-a11y.pdf (last accessed on May 11, 2020)

B.4.2 Model Network and Analysis Time Periods

The model analyzes SR 85 mainline segments between SR 87 in the south and US 101 in the north. The analysis sections are:

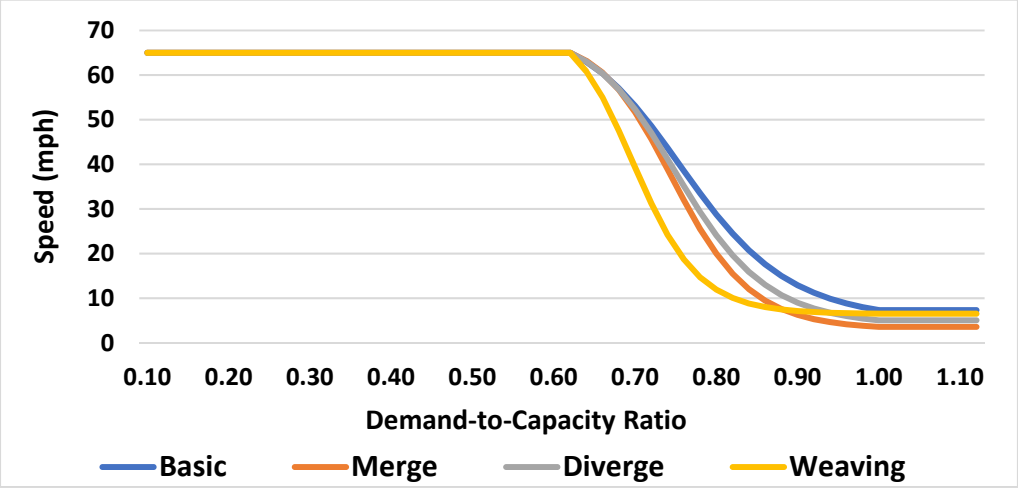
- Section 1 (approximately 5.5 miles): I 280 interchange to US 101 interchange
- Section 2 (approximately 13.5 miles): SR 87 interchange to I 280 interchange

were considered too coarse for traffic operations modeling. The model divides the freeway mainline into the following four segment types: basic, merge, diverge and weaving, as defined by the 2016 Highway Capacity Manual, HCM – the 6th Edition. In the northbound direction, the model defined 53 mainline segments and in the southbound direction, the model defined 54 mainline segments. The model analyzes traffic operations over a 6-hour AM time period (6 am to 12 pm) and a 6-hour PM time period (2 pm to 8 pm) at 15-minute intervals. The spreadsheet model accompanying this report provides more details on the model network coding.

B.4.3 General Purpose Lanes Speeds Estimation

The model defined a set of volume-speed relationships for general-purpose (GP) lanes as shown in **Figure B-69**, one for each freeway segment type, which estimate speed based on the demand to capacity ratio over a freeway segment and a 15-minute interval. As seen in the figure, among the four segment types, a weaving type segment is the most sensitive to increases in demand-to-capacity ratio, and a basic type segment is the least sensitive to increases in demand-to-capacity ratio.

Figure B-69 Volume-Speed Relationships Established on General Purpose Lanes



Source: CDM Smith's SR 85 Traffic Operations Model.

Note: The model structure is: If d/c < 0.62, speed = FFS, else speed = $\gamma + FFS/\left(1 + \alpha \times (v/c)^{\beta}\right)$. α, β and γ for: (a) Basic: (25, 12, 4.85), (b) Merge: (100, 16, 2.96), (c) Diverge: (50, 14, 3.80), and (d) Weaving: (600, 18, 6.44).

The demand on the GP lanes was established using the volumes and capacities in passenger car equivalent units based on the demand-level calculations (Step 1) in Chapter 25 Section 6 – Planning-Level Methodology for Freeway Facilities of the 2016 HCM. According to this, the demand level $d_{i,t}$ on segment i in analysis period t is computed as the demand level in segment

$i-1$, plus the inflow at segment i during analysis period t, minus the outflow at the same segment at analysis period t, plus any carryover demand $d'_{i,t-1}$ in segment i from the previous analysis period $t-1$. The carryover demand $d'_{i,t-1}$ on segment i at analysis period t is the difference between the segment demand and capacity.

The speeds on the GP lanes were estimated and calibrated against the hourly average speed data (see **Section B.2.1**) under the no build alternative (1-1) or existing conditions using both volume and capacity adjustments using a trial and error method. The calibration was aimed to lower the chi-square statistic between the speed estimates and comparison speed data. The general rule followed for the capacity adjustment was to use a minimum and maximum value by freeway segment type: basic: 2,000-2,350 passenger cars per hour per lane (pcphpl); merge or diverge: 1,175-2,000 pcphpl; and, weaving: 1,175-1,800 pcphpl. The limits were established based on Caltrans PeMS estimated capacity ranges at detector stations using February 2020 flow and speed data. A few exceptions violating the general rule for capacity were allowed to improve the match between the estimated speeds and the observed speeds. In addition, volumes were capped (adjusted downward) at a few segments where the estimated speeds without capping were much lower than the observed speeds; and there was no room left to increase the capacity. The adjusted volumes used in the model were kept balanced similar to the unadjusted volumes developed in **Section B.2.3.5**.

The estimated hourly average speeds on the GP lanes using the traffic operations model under the no build alternative (1-1) are shown in **Figure B-70**. The model output speeds are very close to comparable speed data in and around the AM and PM peak hours of 7:45 am to 8:45 am and 5:00 pm to 6:00 pm. However, the differences between the model output speeds and comparable speed data are larger on the shoulders of the peak period.

Figure B-70 SR 85 Hourly Average Speeds on General-Purpose Lanes based on Traffic Operations Model Midweek 6 am to 8 pm Estimates

Northbound Freeway Segments

Mountain View ← San Jose

Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	65	65	65	61	62	63	46	65	64	64	62	64	65	64	62	65
7:00 AM	53	55	55	34	36	46	21	52	49	46	37	39	51	43	33	45
8:00 AM	48	51	51	29	31	42	18	40	38	34	26	27	37	30	21	32
9:00 AM	48	51	51	29	31	42	18	41	39	35	27	28	39	31	22	33
10:00 AM	48	51	51	29	31	42	19	49	46	43	32	35	48	39	28	41
11:00 AM	48	51	51	29	31	42	19	64	62	62	54	58	65	60	55	62
12:00 PM																
1:00 PM																
2:00 PM	65	65	65	65	65	65	65	65	64	64	57	64	63	65	56	65
3:00 PM	65	65	65	65	65	65	65	65	64	64	54	64	60	65	52	65
4:00 PM	65	65	65	65	65	65	65	65	64	65	59	65	64	65	58	65
5:00 PM	65	65	65	65	65	65	65	65	63	63	52	63	58	65	49	65
6:00 PM	65	65	65	65	65	65	65	65	65	65	61	65	64	65	60	65
7:00 PM	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65

	Southbound Freeway Segments															
	Mountain View →															San Jose
Time of Day	US 101 (Mountain View) to Moffett Blvd	Moffett Blvd to Central Expy	Central Expy to SR-237	SR-237 to El Camino Real	El Camino Real to Fremont Ave	Fremont Ave to Homestead Rd	Homestead Rd to I-280	I-280 to Stevens Creek Blvd	Stevens Creek Blvd to De Anza Blvd	De Anza Blvd to Saratoga Ave	Saratoga Ave to Winchester Blvd	Winchester Blvd to SR-17	SR-17 to Union Ave	Union Ave to Camden Ave	Camden Ave to Almaden Expy	Almaden Expy to SR-87
6:00 AM	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
7:00 AM	65	65	65	65	65	60	63	59	65	65	65	65	64	65	65	65
8:00 AM	65	65	65	65	65	54	59	51	65	65	64	65	62	65	65	65
9:00 AM	65	65	65	65	65	55	59	53	65	65	64	65	62	65	65	65
10:00 AM	65	65	65	65	65	59	63	58	65	65	65	65	64	65	65	65
11:00 AM	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
12:00 PM																
1:00 PM																
2:00 PM	55	41	31	34	38	43	61	43	12	20	22	33	21	22	27	51
3:00 PM	51	35	28	28	33	37	59	38	11	20	22	33	21	22	27	51
4:00 PM	57	45	32	38	42	46	63	47	11	20	22	33	21	22	27	51
5:00 PM	48	31	27	25	29	34	57	34	11	20	22	33	21	22	27	51
6:00 PM	59	49	36	43	46	50	63	51	11	20	22	33	21	22	27	51
7:00 PM	65	65	60	64	64	64	65	65	15	20	22	33	21	22	27	51

Source: CDM Smith's SR 85 Traffic Operations Model.

Legend	
Green	Greater than 55 mph
Yellow	45 to 55 mph
Orange	35 to 45 mph
Red	Less than 35 mph

Table B-8 shows the estimated chi-squared statistics for comparison of the model estimated speeds with the measured speed data (mostly using Caltrans PeMS with a few segments using Google Maps) by direction and time of day.

Table B-8 Chi-Square Statistics for Goodness of Fit between Model Estimated Speeds and Measured Speeds by Direction and Time of Day

Direction	Chi-Square Statistic			
	6-Hour AM Period	6-Hour PM Period	8 AM – 9 AM	5 PM – 6 PM
Northbound	282.9	25.6	1.8	3.3
Southbound	18.0	377.1	5.7	3.1

Source: CDM Smith's SR 85 Traffic Operations Model; Caltrans PeMS Detector Stations Speed Data; Google Maps "DistanceMatrix" Application Programming Interface

B.4.4 HOV Lane Speeds Estimation

For the HOV lane, the model used a corridor level average HOV lane volume and adjusted the GP lane volume for each segment to the total volume minus this average HOV lane volume. This simplification was done given a limited number of mainline counts (only at four locations) were taken and the ramp counts were not distinguished into vehicles headed to/coming from GP lanes and vehicles headed to/coming from the HOV lane. The HOV lane average volumes in the northbound AM, northbound PM, southbound AM and southbound PM peak hours were calculated as: 1,489 vehicles/hour, 609 vehicles/hour, 324 vehicles/hour and 1,401 vehicles/hour, respectively.

The speed estimation was made using the speed-flow curve formulae for a basic managed lane found in Chapter 12 Section 4 – Extensions to the Methodology to Basic Managed Lane Segments

of the 2016 HCM. According to this, the speed on a managed lane is a composite value derived from: speed within the linear portion of the speed–flow curve; speed drop within the curvilinear portion of the speed–flow curve; and, additional speed drop (mi/h) within the curvilinear portion of the speed–flow curve when the density of the adjacent general purpose lane is more than 35 pc/mi/ln (also called the "frictional effect" of the adjacent general purpose lane). The HOV lane was modeled as a "continuous access" type facility throughout the length of the SR 85 corridor and associated parameters in the 2016 HCM were used to estimate speed on the HOV or managed lane.

B.4.5 Infrastructure Changes Coding and Volume Changes Estimation

For the build alternatives, the model performs three types of volume change calculations on general purpose and managed lanes: induced demand due to addition of freeway auxiliary lane-miles or express lane-miles; transit mode shift related auto demand reduction; and, HOV use restrictions and tolling related to auto sub-mode demand shifts.

B.4.5.1 Induced Demand due to Infrastructure Changes

Induced demand was estimated using the induced demand calculator developed by the researchers at the National Center for Sustainable Transportation at the University of California, Davis[16]. The calculator allows users to estimate the VMT induced annually as a result of adding general-purpose or HOV lane-miles to roadways managed by the California Department of Transportation (Caltrans) in one of California's urbanized counties (counties within a metropolitan statistical area (MSA)). The calculator applies only to Caltrans-managed facilities with Federal Highway Administration (FHWA) functional classifications of 1, 2 or 3. That correspond to interstate highways (class 1), other freeways and expressways (class 2), and other principal arterials (class 3). In this analysis, an elasticity value of 0.75 associated with class 3 facilities, representing a ratio of percentage change of vehicle-miles traveled over percentage change of lane-miles was used. The induced demand was added only to the mainline segments from interchange to interchange where lane-miles are added and was assumed to use the upstream on-ramp and downstream off-ramp of the mainline segment to enter and leave the SR 85 corridor. All build alternatives have an addition of 1.1-mile long auxiliary lane in SR 85 northbound direction between S De Anza Boulevard and Stevens Creek Boulevard interchanges. The Short and Long Dual Express Lane alternatives (2-2 and 2-3) add HOV lane-miles in both directions of SR 85. While the alternative 2-2 builds about 12.5 HOV lane-miles in each direction of the freeway between SR 87 and I-280, the alternative 2-3 builds about 18.0 HOV lane-miles in each direction of the freeway between SR 87 and US 101. The maximum induced demand was capped at 1,000 vehicles/hour in this analysis. The cap was active only at the segments with addition of both an auxiliary lane and a second HOV lane.

B.4.5.2 Mode Shift due to Transit Alternatives

Transit mode shift is based on the ridership estimation detailed in **Appendix A** of this report. Using the origin-destination station pair level ridership estimates developed for the AM and PM time periods and the various transit alternatives (3-1, 3-2, 3-3, 4-1 and 4-2) and routing options

[16] https://blinktag.com/induced-travel-calculator/index.html (last accessed on May 11, 2020)

(on-corridor transit stations and off-corridor transit stops) as inputs, the model derives SR 85 mainline segment level ridership estimates. The AM and PM time periods used in the transit analysis and ridership estimation are 6 am to 10 am and 3 pm to 7 pm, respectively. Using traffic volume factors over these hours and a service frequency of one bus every 15-minute interval, number of buses and ridership per bus in each 15-minute interval, traffic analysis was conducted for the various transit alternatives and routing options. El Camino Real to Mountain View LRT Station in the SR 85 northbound direction and Bascom Avenue to Saratoga Avenue in the SR 85 southbound direction are generally the busiest segments in terms of ridership. The ridership per bus estimates are low and even in the peak hour the ridership is less than 10 persons per bus under both routing options, so the transit mode shift has small impact on the SR 85 mainline traffic. The auto trip reduction in vehicle units was computed assuming that the transit ridership gain would come from single occupancy vehicles (SOVs) and the resultant traffic would be distributed among GP and HOV lanes in the same proportion as the No Build traffic.

B.4.5.3 Auto Sub-Mode Shift due to Changes in HOV Use Restrictions and Tolling

Under the build alternatives, HOV use restrictions change and tolling is introduced as described in **Section 2.2.2** of this report. While the exact pricing strategy for tolling is not determined at the time of this analysis, the project proposed HOV use restrictions and tolling rules are known and there are also federal and Caltrans guidance on HOV lane to express lane conversion. There are HOV lane occupancy surveys conducted for SR 85 and empirical data based on other planned or implemented projects and research with similar HOV use restrictions and tolling rules as the SR 85 project. These were used to estimate the auto sub-mode demand shifts between the proposed express lanes and GP lanes. The auto sub-modes include single occupancy vehicles (SOVs), high occupancy vehicle with 2 occupants (HOV2) and high occupancy vehicle with 3 or more occupants (HOV3+).

The information used in the auto sub-mode demand shifts include the following:

- For a HOV facility with a speed limit of 50 miles per hour or greater, federal guidance[17] requires the HOV lane to meet a minimum average operating speed of 45 mph for 90 percent of the time over a 180-day monitoring period during morning and evening weekday peak hours (or both), or else it is degraded.
- According to the Caltrans HOV guidelines[18], for buffered or contiguous HOV facilities, Caltrans considers LOS-C occurs at approximately 1,650 vehicles per hour, less if there is significant bus volume or if there are physical constraints. The SR 85 analysis assumed that the proposed express lanes in the peak direction (northbound AM and southbound PM) would carry 1,650 vehicle per hour per lane under both single and dual express lane configuration. The non-peak directions (northbound PM and southbound AM) would carry about half or 825 vehicles per hour per lane with dual express lane configuration, with no changes in volume with the single express lane configuration.

[17] https://ops.fhwa.dot.gov/freewaymgmt/hovguidance/hovguidance.pdf (last accessed on May 11, 2020)
[18] https://dot.ca.gov/programs/traffic-operations/hov (last accessed on May 11, 2020)

As noted in **Section B.2.3.7** of this report, the HOV violation rates on SR 85 are expected to be 10 percent or lower on average, for the the sub-mode shift calculations, this was assumed at 10 percent both under existing and proposed express lanes conditions.

As per an implemented I-10 Metro Express Lanes project[19] and I-105 Express Lanes Project Application[20], the SOV share after building express lanes is expected to be around 45 percent including violators while the HOV2 share is expected to range as 15 to 25 percent and the remaining 30 to 40 percent being HOV3+.

As part of Texas DOT research[21], a 4,600-respondent survey of freeway users in Houston and Dallas and a simulation modeling of six alternative HOV scenarios at varying toll rates were conducted to identify the tradeoffs associated with HOV toll discounts in new managed lanes. Based on this research, the percent changes in SOV, HOV2 and HOV3+ shares on HOV lane under the toll settings of HOV2 are at 25-50% of SOV Toll and HOV3+ are free. While SOV and HOV3+ shares as percent of HOV lane total are expected to go up by 2.4 percent and 2.3 percent, respectively; the HOV2 share as a percent of HOV lane total is expected to drop by 4.7 percent.

Additional studies relating to implemented projects and performance reports on I-680, I-580 and SR 237 in the San Francisco Bay Area were also reviewed but none of these were similar in HOV use restrictions or tolling to the proposed SR 85 express lanes. While the US 101 HOV to express lane conversion project in San Mateo County has an application that is similar to the proposed SR 85 express lanes, the auto sub-mode shares and vehicle occupancy changes due to the project were not well-documented. Also, no documented "before" and "after" data was found on I-80 HOV3+ lanes in Alameda/Contra Costa Counties.

Existing HOV lane shares of SOV, HOV2 and HOV3+ were estimated as described in **Section B.2.3.7** of this report.

As per the 2017 National Household Travel Survey[22], the average vehicle occupancy (AVO) for non-weekend trips for San Jose-Sunnyvale-Santa Clara, CA Core-Based Statistical Area (CBSA) on average is 1.35 for AM trip start times between 6 am and 11 am and on average is 1.54 for PM trip start times between 2 pm and 7 pm. These AVO values were used as averages for all SR 85 mainline lanes combined to make fine adjustments to the SOV, HOV 2 and HOV3+ shares on the existing HOV lanes and proposed express lanes on SR 85.

Table B-9 shows the auto sub-mode share assumptions under the "before" conditions of HOV lane and "after" conditions of proposed express lanes.

Table B-9 "Before" and "After" HOV lane Auto Sub-Mode Share Assumptions

Direction	Lane Context	Sub-Mode	"Before" Auto Sub-Mode Share		"After" Auto Sub-Mode Share	
			AM Period	PM Period	AM Period	PM Period
Northbound	Managed Lane	SOV (Paying Tolls)	23%	19%	50%	45%
		SOV (Violators)	10%	10%	10%	10%
		HOV2	54%	57%	20%	23%
		HOV3+	13%	14%	20%	23%
		TOTAL	**100%**	**100%**	**100%**	**100%**
	All Lanes	SOV	72%	59%	74%	61%

[19] Metro Express Lanes Operational Performance Report, Fiscal Year 2018.

[20] https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2019/2019-09/metro-i105-express-lanes-application.pdf (last accessed on May 11, 2020)

[21]

[22] https://nhts.ornl.gov/ (last accessed on May 11, 2020)

Direction	Lane Context	Sub-Mode	"Before" Auto Sub-Mode Share		"After" Auto Sub-Mode Share	
			AM Period	PM Period	AM Period	PM Period
		HOV2	22%	30%	17%	25%
		HOV3+	7%	12%	10%	15%
		TOTAL	**100%**	**100%**	**100%**	**100%**
Southbound	Managed Lane	SOV (Paying Tolls)	29%	25%	50%	45%
		SOV (Violators)	10%	10%	10%	10%
		HOV2	49%	52%	20%	23%
		HOV3+	12%	13%	20%	23%
		TOTAL	**100%**	**100%**	**100%**	**100%**
	All Lanes	SOV	72%	59%	74%	61%
		HOV2	22%	30%	17%	25%
		HOV3+	7%	12%	10%	15%
		TOTAL	**100%**	**100%**	**100%**	**100%**

Source: CDM Smith Assumptions based on Various Sources listed in **Section B.4.5.3** of this Report

B.4.5 Model Limitations

There are some limitations with this spreadsheet-based sketch planning traffic operations model that include:

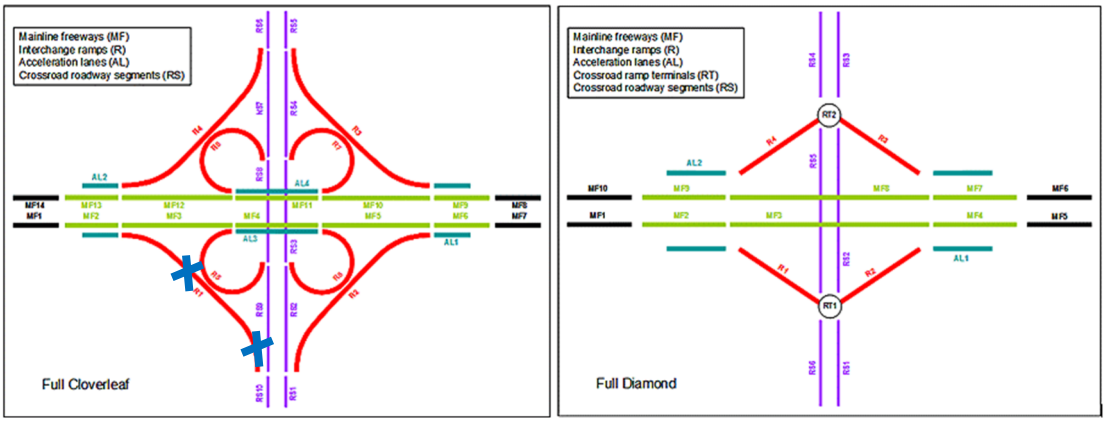
- Although the model accounts for the demand relationships over adjacent time intervals and segments, a key limitation of the model is that queues formed within a segment do not propagate to upstream links instead as HCM 2016 describes the planning-level calculations form "vertical" queues within a segment. By using longer segments that include the bottlenecks and a sufficiently long upstream segment where queuing occurs, this limitation can be overcome. In this analysis, the average length of the segments was almost 1,800 feet.
- The model does not directly consider ramp influence area factors such as length of acceleration and deceleration lanes. While McTrans' Highway Capacity Software Version 7 (HCS7) was considered for modeling initially due to its ability to consider these factors, the length of the SR 85 corridor and number of analysis segments made the calibration of the HCS7 model using the measured speed data (mostly using Caltrans PeMS with a few segments using Google Maps) difficult. The sketch planning model in comparison was easier to calibrate due to the independence of performance measures (particularly, speed) on the mainline segments. The ramp influence area factors affect all alternatives and were not considered key to the selection between the alternatives.
- The model does not explicitly analyze the impact of tolling on clean air vehicles (CAVs), these vehicle types were grouped with the general single occupant vehicle (SOV) type. The reason for not analyzing CAVs separately is that the empirical data collected was insufficient to model their HOV lane usage impacts. It is noted however that the effects are likely similar to that for HOV2 vehicle type due to a similar level of tolling for CAVs, which is 50 percent of SOV toll. Differences in demographic characteristics (age, income, etc.) of the operators of CAV and HOV2 vehicle types would also play a small role in determining the HOV lane usage impacts of CAVs.
- The model is not capable of analyzing the El Camino Real interchange improvement as it relates mainly to ramp reconfiguration. This improvement was separately analyzed as a special case as described in the next section (**Section B.5**) of this report.

B.5 Special Case Analysis – El Camino Real Interchange Improvement

A special case analysis using McTrans' Highway Capacity Software Version 7 (HCS7) was conducted on a proposed El Camino Real interchange reconfiguration from a cloverleaf to a diamond configuration. This project is necessary to accommodate the transit bus stops at the El Camino Real interchange for the right side transit lane or right side bus on shoulder alternatives using the on-corridor transit stations routing option.

Under the no build condition, the cloverleaf interchange has 4 loop ramps and 3 slip ramps. The missing slip ramp that would make it a full cloverleaf interchange is from SR 85 southbound to El Camino Real (SR 82) westbound. Under the build conditions, the diamond interchange has 4 slip ramps. **Figure B-71** is showing the "before" and "after" configurations for illustration purposes.

Figure B-71 Illustrative "Before" and "After" Configurations of SR 85 / El Camino Real (SR 82) Interchange



Source: https://www.fhwa.dot.gov/publications/research/safety/07045/applic.cfm (last accessed on May 11, 2020)

+ - Roadway link is absent on ground at SR 85 / El Camino Real interchange

The interchange infrastructure and volume inputs "before" and "after" the improvement are coded in HCS7 and over the model network extents as summarized in **Table B-10**. While the SR 85 northbound off-ramp and SR 85 southbound on-ramp for the diamond interchange are assumed to be located 2,500 feet south of the El Camino Real roadway centerline, the ramps north of it, that is, SR 85 northbound on-ramp and SR 85 southbound off-ramp, would be located only 775 feet and 1,100 feet north of the El Camino Real roadway centerline due to the presence of nearby ramps to/from SR 237. The unadjusted and balanced peak hour volumes developed in **Section B.2.3.5** of this report and the 15-minute interval volume factors developed in **Section B.2.3.6** of this report were used in this special case analysis.

The output performance measures for the special case analysis are discussed in the next section (**Section B.6**) of this report.

Table B-10 "Before" and "After" Infrastructure and Volume Inputs at and around SR 85 / El Camino Real (SR 82) Interchange Improvement

Segment	Seg. Type	Seg. Length (ft)	Acc. Lane Length (ft)	Dec. Lane Length (ft)	Num. of GP Lanes	Num. of ML Lanes	AM Peak Hour GP Lane Demand (veh/hr)	AM Peak Hour ML Lane Demand (veh/hr)	PM Peak Hour GP Lane Demand (veh/hr)	PM Peak Hour ML Lane Demand (veh/hr)
Northbound "Before"										
Fremont Ave On-Ramp to El Camino Real/SR 82 EB Off-Ramp – 1	Basic	4,975			2	1	4,086	1,489	3,011	609
Fremont Ave On-Ramp to El Camino Real/SR 82 EB Off-Ramp – 2	Diverge	1,500		150	2	1	4,086	1,489	3,011	609
El Camino Real/SR 82 EB Off-Ramp to EB Loop On-Ramp	Basic	845			2	1	3,816	1,489	2,691	609
El Camino Real/SR 82 EB Loop On-Ramp to WB Loop Off-Ramp	Weaving	280			3	1	4,001	1,489	2,811	609
El Camino Real/SR 82 WB Loop Off-Ramp to WB On-Ramp	Basic	635			2	1	3,586	1,489	2,266	609
El Camino Real/SR 82 WB On-Ramp to SR 237 EB Off-Ramp	Weaving	460			3	1	4,466	1,489	2,801	609
SR 237 EB Off-Ramp to EB On-Ramp	Basic	960			2	1	2,921	1,489	2,111	609
Northbound "After"										
Fremont Ave On-Ramp to El Camino Real/SR 82 EB Off-Ramp – 1	Basic	3,460			2	1	4,086	1,489	3,011	609
Fremont Ave On-Ramp to El Camino Real/SR 82 EB Off-Ramp – 2	Diverge	1,500		750	2	1	4,086	1,489	3,011	609
El Camino Real/SR 82 EB Off-Ramp to WB On-Ramp	Basic	3,275			2	1	3,401	1,489	2,146	609
El Camino Real/SR 82 WB On-Ramp to SR 237 EB Off-Ramp	Weaving	460			3	1	4,466	1,489	2,801	609
SR 237 EB Off-Ramp to EB On-Ramp	Basic	960			2	1	2,921	1,489	2,111	609
Southbound "Before"										
SR 237 WB Off-Ramp to On-Ramp	Basic	950			2	1	1,546	324	2,424	1,401
SR 237 WB On-Ramp to El Camino Real/SR 82 WB Loop On-Ramp - 1	Merge	1,500	1,100		2	1	2,231	324	3,389	1,401
SR 237 WB On-Ramp to El Camino Real/SR 82 WB Loop On-Ramp - 2	Basic	565			2	1	2,231	324	3,389	1,401
El Camino Real/SR 82 WB Loop On-Ramp to EB Loop Off-Ramp	Weaving	310			3	1	2,671	324	3,629	1,401
El Camino Real/SR 82 EB Loop Off-Ramp to EB On-Ramp	Basic	785			2	1	2,316	324	3,159	1,401
El Camino Real/SR 82 EB On-Ramp to Fremont Ave Off-Ramp - 1	Merge	1,500	420		2	1	2,976	324	3,834	1,401
El Camino Real/SR 82 EB On-Ramp to Fremont Ave Off-Ramp - 2	Basic	5,050			2	1	2,976	324	3,834	1,401
Southbound "After"										
SR 237 WB Off-Ramp to On-Ramp	Basic	950			2	1	1,546	324	2,424	1,401
SR 237 WB On-Ramp to El Camino Real/SR 82 WB Off-Ramp	Weaving	1,110			3	1	2,231	324	3,389	1,401
El Camino Real/SR 82 WB Loop Off-Ramp to EB On-Ramp	Basic	3,610			2	1	1,876	324	2,919	1,401
El Camino Real/SR 82 EB On-Ramp to Fremont Ave Off-Ramp – 1	Merge	1,500	750		2	1	2,976	324	3,834	1,401
El Camino Real/SR 82 EB On-Ramp to Fremont Ave Off-Ramp – 2	Basic	3,490			2	1	2,976	324	3,834	1,401

Source: Google Earth for SR 85 / El Camino Real (SR 82) Interchange No Build conditions; Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis and Assumptions for SR 85 / El Camino Real (SR 82) Interchange Build conditions.

Note: Seg. = Segment, Acc. = Acceleration, Dec. = Deceleration, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

B.6 Traffic Performance Measures

The traffic performance on SR 85 was evaluated for the alternatives and the special case of El Camino Real improvement in terms of vehicle miles of travel and miles of congestion (on general purpose lanes). Other traffic performance measures were also computed for information purposes and include the following: vehicle hours of travel, vehicle hours of delay at threshold speedof 45 mph, average speed, percent miles with freeway level of service (LOS) of E or F[23] (on general purpose lanes), and percent ramp influence areas congested. The key performance measures are discussed followed by a summary of the results for the alternatives and the special case analysis. A qualitative discussion of the traffic impacts of the alternatives on local streets is also presented.

B.6.1 Vehicle Miles of Travel

The SR 85 corridor vehicle miles of travel (VMT) varies between the alternatives due to the same factors that affect the volume changes, namely: induced demand due to addition of freeway auxiliary lane-miles or express lane-miles; transit mode shift related auto demand reduction; and HOV use restrictions and tolling related auto sub-mode demand shifts. All build alternatives have a change in VMT due to induced demand. The transit lane alternatives (3-1, 3-2, 3-3) and the bus on shoulder alternatives (4-1 and 4-2) have a change in VMT due to transit mode shift. All build alternatives (2-1, 2-2, 2-3, 3-1, 3-2, 3-3, 4-1 and 4-2) have a change in VMT due to auto sub-mode deman shifts related to HOV use restrictions and tolling. In this analysis, the volume and VMT changes were localized to the segments where the changes in lane-miles and modal or sub-modal use changes occurred.

A one percent increase in lane-miles results in a 0.75 percent increase in VMT. When no lane-miles of general purpose or managed lanes are added it is assumed there will be no change in person throughput. In other words, induced demand due only to speed changes was not estimated. A substantial increase in lane-miles and VMT comes from the development of dual express lanes under Express Lane Alternatives 2-2 and 2-3. Auxiliary lanes added to northbound SR 85 between S De Anza Boulevard and Stevens Creek Boulevard interchanges under all build alternatives also contribute to a small increase in VMT.

The higher the ridership estimate under a transit service alternative, the higher is the auto VMT reduction. The analysis found that the ridership per bus estimates are low and even in the peak hour the ridership is less than 10 persons per bus on all SR 85 mainline segments. The transit mode shift has a very small impact on VMT.

Due to the changes in the HOV use restrictions and tolling, the auto sub-modes using the HOV lane would undergo a compositional change. While SOV and HOV3+ shares as percent of HOV lane total

[23] According to the HCM 2016, level of service or LOS on freeway segments is defined by density measured in passenger cars per mile per lane (pcpmpl). The HCM defines six LOS service thresholds. LOS A (free-flow conditions): less than 11 pcpmpl, LOS B (reasonably free-flow conditions): > 11-18 pcpmpl, LOS C (speeds near free flow speed but freedom to maneuver within the traffic stream is noticeably restricted): > 18-26 pcpmpl, LOS D (speeds begin to decline below free flow speed and freedom to maneuver within the traffic stream is seriously limited): > 26-35 pcpmpl, LOS E (flow at or near capacity and little room to maneuver within the traffic stream): > 35-45 pcpmpl, and LOS F (unstable flow and traffic breakdowns): > demand exceeds capacity or density > 45 pcpmpl.

are expected to go up by 2.4 percent and 2.3 percent, respectively, the HOV2 share as percent of HOV lane total is expected to drop by 4.7 percent. The added SOV and HOV3+ vehicles would come from the GP lanes, while the removed HOV2 vehicles (and also possibly some CAVs) would travel on the GP lanes. A net decrease in VMT due to an overall increase in average vehicle occupancy on SR 85 corridor is expected and is associated with the change in HOV use restrictions and tolling.

Under the special case analysis for El Camino Real conversion from a cloverleaf to diamond interchange, the change in VMT is attributed to changes in throughput at ramp influence areas associated with the re-configured freeway-to-ramp and ramp-to-freeway flows as well as ramp capacity.

B.6.2 Miles of Congestion

A sketch planning traffic operations model was used to estimate 15-minute interval speeds by freeway mainline segment for the alternatives analysis and HCS7 was used for the special case analysis for the proposed El Camino Real improvement. Using the speed threshold of 45 mph on each SR 85 mainline segment, the peak 15-minute interval speeds in the AM and PM peak hours (by direction) were analyzed to evaluate congestion by freeway mainline segment. The length of all congested freeway segments is reported as miles of congestion. Queuing was not studied in this analysis due to model limitations and miles of congestion cannot be interpreted as queue lengths.

B.6.3 Other Performance Measures

Similar to the miles of congestion, a sketch planning traffic operations model was used to estimate other performance measures in the AM and PM peak hour for the alternatives analysis. HCS7 was used for the special case analysis of the proposed El Camino Real improvement. Average speed is a direct output of the models. Vehicle hours of travel were estimated using 15-minute interval volumes and average travel time (segment length divided by average speed) by freeway mainline segment. Vehicle hours of delay was estimated using 15-minute interval volumes and average travel time in excess of travel time at a threshold speed of 45 mph. Delay is zero when the travel time is below the travel time at the threshold speed, and increases as speed drops below 45 mph. Freeway density was computed on GP lanes as GP lane volume served in passenger cars per hour divided by GP lane speed and number of GP lanes. LOS was identified for freeway segments based on the estimated density and LOS criteria in the 2016 HCM as shown in **Figure B-72**. Based on the network coding, the ramp influence areas (merge, diverge or weaving type mainline segments) were identified. The segments with average speed below the threshold speed of 45 mph were counted.

Figure B-72 2016 HCM's Level of Service (LOS) Criteria for Basic Freeway Segment

LOS	Density (pc/mi/ln)
A	≤11
B	>11–18
C	>18–26
D	>26–35
E	>35–45
F	Demand exceeds capacity OR density > 45

Source: Exhibit 12-15 of 2016 HCM

B.6.4 Local Streets

The impacts of induced traffic due to addition of lane-miles or the benefits of mode shifts on local streets is expected to be minimal compared to the impacts/benefits on the SR 85 mainline. No data was collected directly on the local streets for this analysis. However, the on-ramp and off-ramp volumes were estimated. By inspecting the speeds at the mainline merge and diverge segments under the alternatives, the impacts on local streets were indirectly evaluated. Low speeds in merge area could result in queue spillbacks from on-ramps to local streets, while low speeds in diverge area could result in delays to the traffic exiting SR 85 via off-ramps. The total number of merge, diverge and weaving areas with speeds below 45 mph by alternative in the AM and PM peak 15-minute interval by direction of movement were estimated. There are 28 ramp influence areas in each direction.

Local street traffic can also have impacts on transit operations. The off-corridor routing option includes three offline stations located at De Anza College, West Valley College, and Good Samaritan Hospital. The access to these stations would incur travel time delays due to traffic congestion on local streets. The transit operations analysis in **Appendix E** includes estimates of access times to the offline stations via local streets.

B.6.5 Results for Alternatives Analysis

Table B-11 is showing the year 2020 traffic performance measures estimated on SR 85 corridor between SR 87 and I-280 in the AM and PM peak hours by direction of movement for the 14 alternatives defined for the SR 85 Transit Guideway Project. Note that the results are based on the travel conditions prior to the advent of California and SF Bay Area coronavirus/COVID-19 stay home orders of 2020.

Under the No Change Alternative 1-1, the northbound VMT in the AM peak hour is 1.2 times that of PM peak hour. The southbound VMT in PM peak hour is 1.5 times that of AM peak hour. The SR 85 southbound PM peak hour VMT is 5 percent higher than the SR 85 northbound AM peak hour VMT. In terms of miles of congestion, SR 85 northbound is congested over 7.2 miles of the 18.0 miles in the AM peak hour. SR 85 southbound is congested over 7.7 miles of the 18.0 miles in the PM peak hour, which is about 7 percent higher than the SR 85 northbound AM peak hour.

Comparing the alternatives, VMT is estimated to increase as high as 23 percent in both the northbound and southbound directions under Alternative 2-3, long dual express lane compared to the no Alternative 1-1 No Change. Under Alternative 2-2 short duel express lane, VMT is slightly lower but reaches 17 percent increase over the no change alternative. Alternative 2-1, a conversion of HOV to express lane would result in about a 1 percent increase in VMT over the no change alternative. Transit alternatives (3-1, 3-2, 3-3 Transit Lanes, 4-1 and 4-2 Bus on Shoulder) and their routing options would be marginally lower than Alternative 2-1 due to a mode shift from transit to auto.

Comparing the alternatives, the miles of congestion would decrease by 94 percent in the northbound AM peak direction and by 88 percent in the southbound PM peak direction under the long dual express lane Alternative 2-3 compared to the no change alternative. Under the short dual express lane Alternative 2-2, the miles of congestion would decrease by 81 percent in the northbound AM peak direction and by 60 percent in the southbound PM peak direction. HOV to express lane conversion,

Alternative 2-2 would reduce the miles of congestion by 40 percent in the northbound AM peak direction and by 33 percent in the southbound PM peak direction. Transit alternatives (3-1, 3-2, 3-3 Transit Lanes and 4-1 and 4-2 Bus on Shoulder) and their routing options would be similar to Alternative 2-2 in terms of miles of congestion reduced in the northbound AM peak direction, and slightly better in the southbound PM peak direction, where the reduction would be 44 percent.

The number of ramp influence areas congested is indicative of local street impacts. Under the no change alternative, almost 76 percent of the ramp influence areas are congested in the peak hours and directions. The percentage can be reduced to 52 percent or more by implementing any of the build alternatives. The most benefits come from Alternative 2-3, followed by Alternative 2-2. Other performance results are also shown in **Table B-11** for information purposes.

Table B-11 2020 Traffic Performance Measures by SR 85 Transit Guideway Alternative

Alt. #	Alternative Description	Route Option	Alternative Short Description	VMT (veh-mi) AM Peak Hour	VMT (veh-mi) PM Peak Hour	VHT (veh-hrs) AM Peak Hour	VHT (veh-hrs) PM Peak Hour	VHD (veh-hours) AM Peak Hour	VHD (veh-hours) PM Peak Hour	Av Spd (mph) AM Peak Hour	Av Spd (mph) PM Peak Hour	% Miles of Freeway LOS E or F AM Peak Hour	% Miles of Freeway LOS E or F PM Peak Hour	Miles of Congestion* AM Peak Hour	Miles of Congestion* PM Peak Hour	Number of Ramp Influence Areas Congested* AM Peak Hour	Number of Ramp Influence Areas Congested* PM Peak Hour
SR 85 Northbound Mainline Segments (N/O of SR 87 to S/O of US 101)																	
1-1	No Changes	N.A.	1-1	79,825	66,782	2,410	1,115	1,567	107	33	60	34%	5%	7.2	0.9	22	3
2-1	HOV to Express Lane Conversion	N.A.	2-1	80,703	67,546	1,899	1,113	840	101	42	61	19%	5%	4.3	0.9	14	3
2-2	Short Dual Express Lane	N.A.	2-2	91,439	78,329	1,801	1,307	377	124	51	60	8%	5%	1.4	0.9	5	3
2-3	Long Dual Express Lane	N.A.	2-3	96,926	81,984	1,739	1,364	124	124	56	60	2%	5%	0.4	0.9	2	3
3-1	Short Median Transit Lane	In-Corr.	3-1 - RteOpt 1	80,449	67,357	1,871	1,106	818	98	43	61	19%	5%	4.3	0.9	14	3
		Off-Corr.	3-1 - RteOpt 2	80,453	67,369	1,870	1,108	817	99	43	61	19%	5%	4.3	0.9	14	3
3-2	Long Median Transit Lane	In-Corr.	3-2 - RteOpt 1	80,431	67,239	1,869	1,103	816	98	43	61	19%	5%	4.3	0.9	14	3
		Off-Corr.	3-2 - RteOpt 2	80,448	67,248	1,870	1,104	817	98	43	61	19%	5%	4.3	0.9	14	3
3-3	Right Side Median Transit Lane	In-Corr.	3-3 - RteOpt 1	80,438	67,239	1,869	1,103	816	98	43	61	19%	5%	4.3	0.9	14	3
		Off-Corr.	3-3 - RteOpt 2	80,453	67,257	1,870	1,105	817	98	43	61	19%	5%	4.3	0.9	14	3
4-1	Median Bus on Shoulder	In-Corr.	4-1 - RteOpt 1	80,434	67,263	1,869	1,104	816	98	43	61	19%	5%	4.3	0.9	14	3
		Off-Corr.	4-1 - RteOpt 2	80,448	67,248	1,870	1,104	817	98	43	61	19%	5%	4.3	0.9	14	3
4-2	Right Side Bus on Shoulder	In-Corr.	4-2 - RteOpt 1	80,466	67,295	1,873	1,105	819	98	43	61	19%	5%	4.3	0.9	14	3
		Off-Corr.	4-2 - RteOpt 2	80,469	67,257	1,872	1,105	818	98	43	61	19%	5%	4.3	0.9	14	3
SR 85 Southbound Mainline Segments (S/O of US 101 to N/O of SR 87)																	
1-1	No Changes	N.A.	1-1	55,406	83,444	884	3,181	27	2,176	63	26	0%	38%	0.3	7.7	1	21
2-1	HOV to Express Lane Conversion	N.A.	2-1	55,109	82,905	875	2,347	25	1,331	63	35	0%	30%	0.3	5.2	1	15
2-2	Short Dual Express Lane	N.A.	2-2	64,338	96,690	1,003	2,115	0	703	64	46	0%	18%	0.0	3.1	0	8
2-3	Long Dual Express Lane	N.A.	2-3	67,298	102,418	1,039	2,114	0	464	65	48	0%	5%	0.0	0.9	0	3
3-1	Short Median Transit Lane	In-Corr.	3-1 - RteOpt 1	54,985	82,781	872	2,329	25	1,279	63	36	0%	30%	0.3	4.3	1	15
		Off-Corr.	3-1 - RteOpt 2	54,984	82,750	872	2,323	25	1,274	63	36	0%	30%	0.3	4.3	1	15
3-2	Long Median Transit Lane	In-Corr.	3-2 - RteOpt 1	54,919	82,758	869	2,323	24	1,261	63	36	0%	29%	0.3	4.3	1	15
		Off-Corr.	3-2 - RteOpt 2	54,894	82,772	869	2,328	24	1,277	63	36	0%	29%	0.3	4.3	1	15
3-3	Right Side Median Transit Lane	In-Corr.	3-3 - RteOpt 1	54,919	82,758	869	2,323	24	1,261	63	36	0%	29%	0.3	4.3	1	15
		Off-Corr.	3-3 - RteOpt 2	54,909	82,772	869	2,328	24	1,277	63	36	0%	29%	0.3	4.3	1	15
4-1	Median Bus on Shoulder	In-Corr.	4-1 - RteOpt 1	54,919	82,758	869	2,323	24	1,261	63	36	0%	29%	0.3	4.3	1	15
		Off-Corr.	4-1 - RteOpt 2	54,894	82,772	869	2,328	24	1,277	63	36	0%	29%	0.3	4.3	1	15
4-2	Right Side Bus on Shoulder	In-Corr.	4-2 - RteOpt 1	54,919	82,771	869	2,328	24	1,277	63	36	0%	29%	0.3	4.3	1	15
		Off-Corr.	4-2 - RteOpt 2	54,918	82,772	870	2,328	24	1,277	63	36	0%	29%	0.3	4.3	1	15

*Based on GP Lanes - Peak Hour Peak 15-Minute Interval

AM Peak Hour: 7:45 am to 8:45 am; PM Peak Hour: 5 pm to 6 pm.

NOTE: Delay or congestion is assumed when speed on a segment falls below 45 mph (Caltrans threshold)

Source: Google Earth for SR 85 / El Camino Real (SR 82) Interchange No Build conditions; Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith Analysis and Assumptions for SR 85 / El Camino Real (SR 82) Interchange Build conditions.

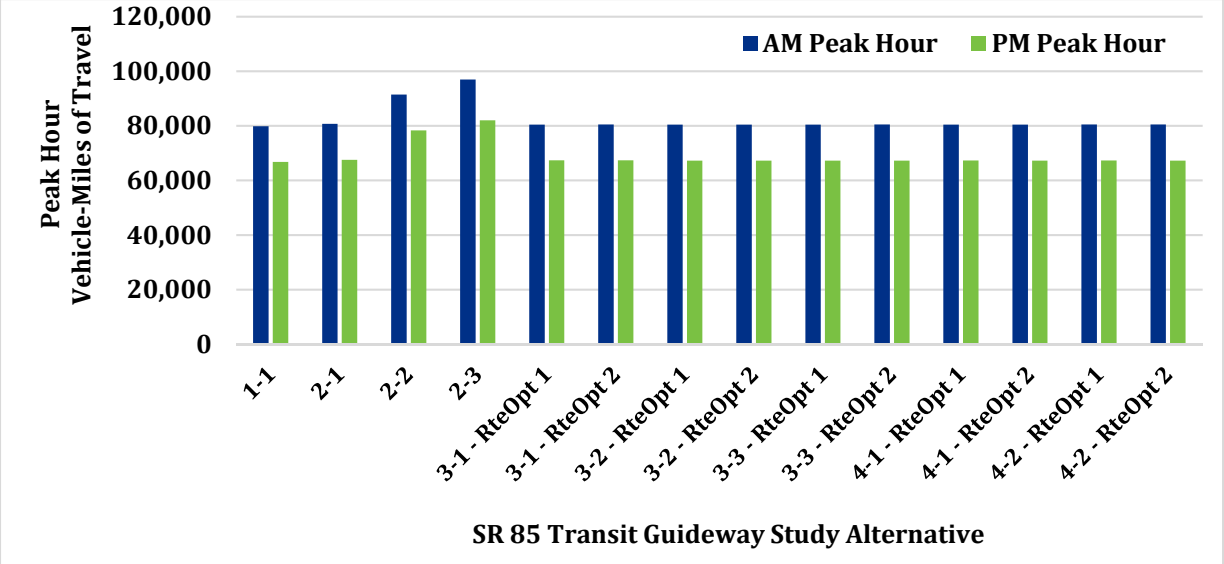
Note: Seg. = Segment, Acc. = Acceleration, Dec. = Deceleration, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

Figures B-73 through **B-75**

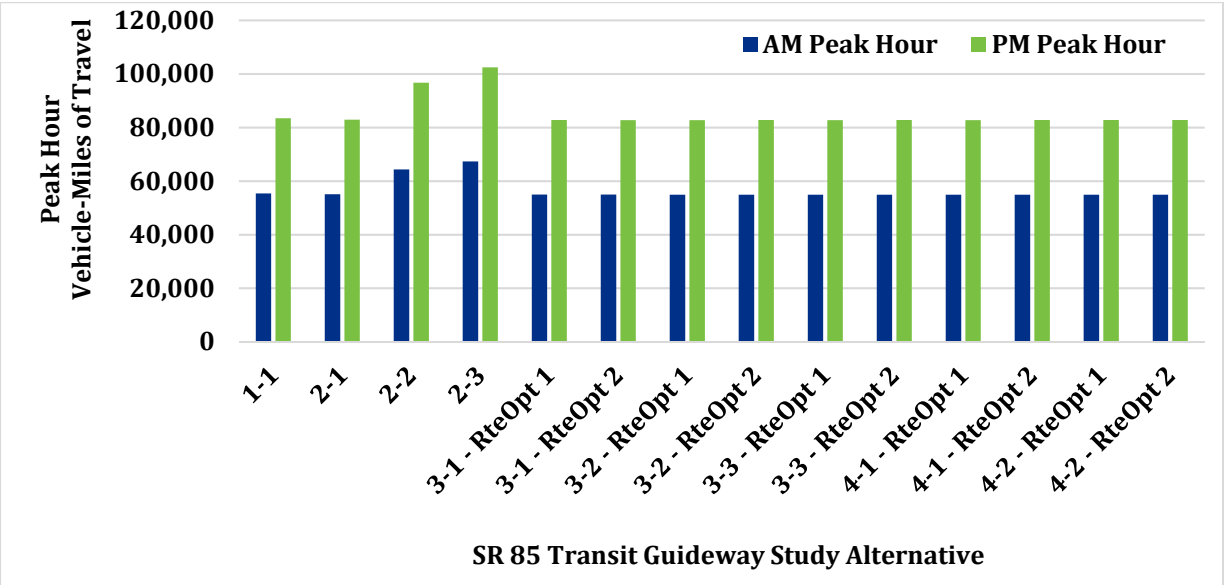
are graphical comparisons of the alternatives in terms of 2020 VMT, VHT and VHD by direction. Despite the increased VMT under the dual express lane alternatives (2-2 and 2-3), there is a 65 to 90 percent reduction in VHD due to improvements in travel time compared to the no change alternative. All other build alternatives result in small increases in VMT and around a 40 percent reduction in VHD over the no change alternative. VHT is also reduced under all build alternatives.

Figure B-73 SR 85 Corridor (SR 87 to I-280) 2020 Vehicle-Miles of Travel (VMT) by Alternative

Northbound Direction



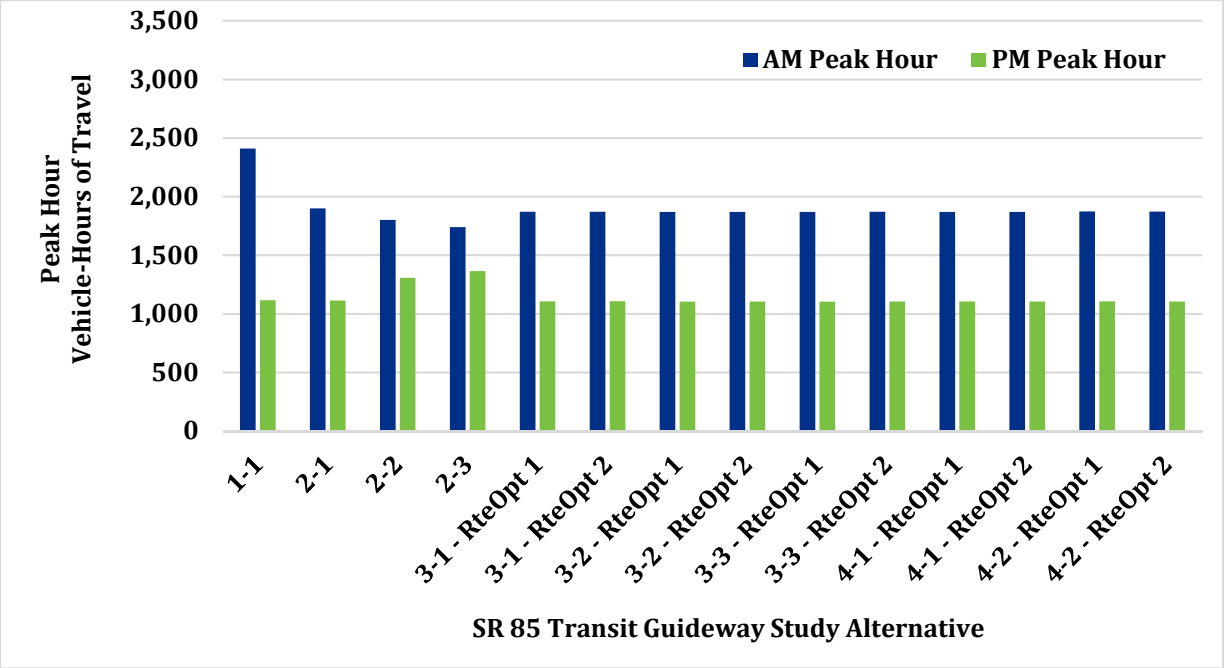
Southbound Direction



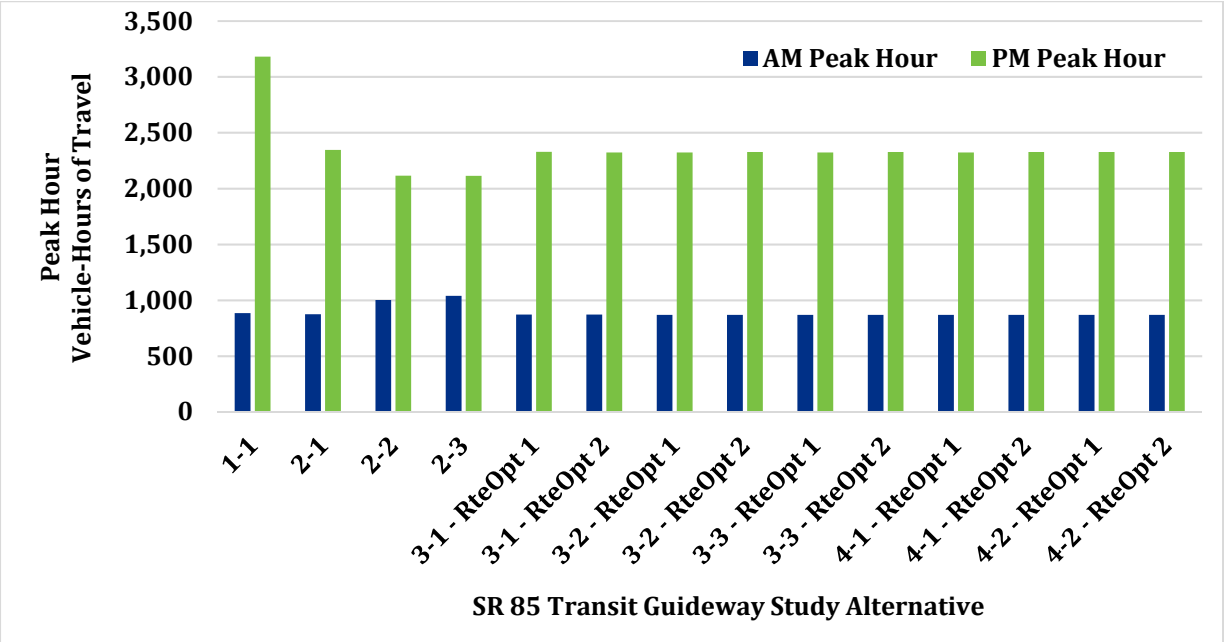
Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith's SR 85 Traffic Operations Model.
Note: Seg. = Segment, Acc. = Acceleration, Dec. = Deceleration, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

Figure B-74 SR 85 Corridor (SR 87 to I-280) 2020 Vehicle-Hours of Travel (VHT) by Alternative

Northbound Direction



Southbound Direction

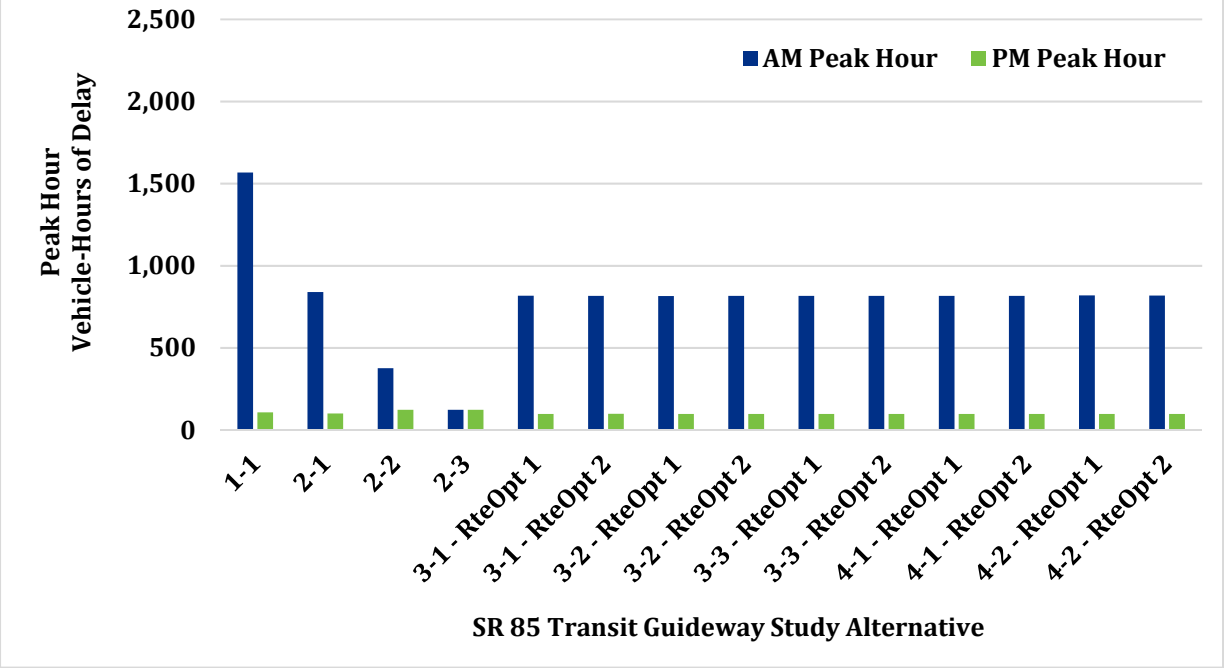


Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith's SR 85 Traffic Operations Model.

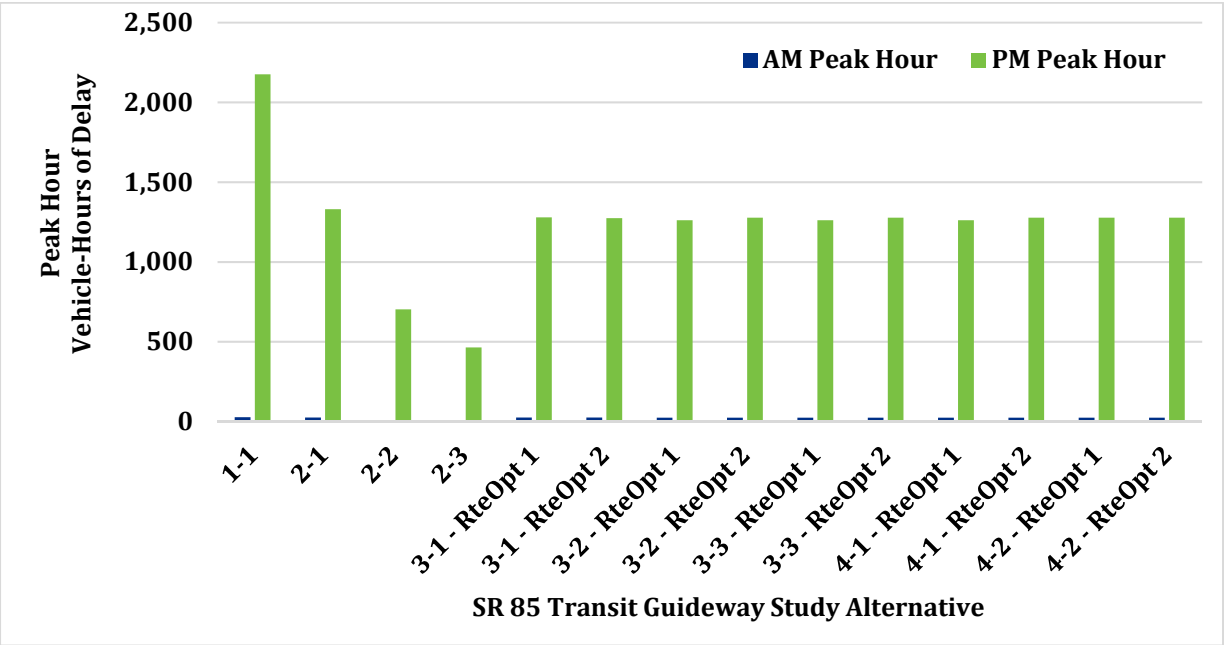
Note: Seg. = Segment, Acc. = Acceleration, Dec. = Deceleration, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

Figure B-75 SR 85 Corridor (SR 87 to I-280) 2020 Vehicle-Hours of Delay (VHD) by Alternative

Northbound Direction



Southbound Direction



Source: Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; CDM Smith's SR 85 Traffic Operations Model.

Note: Seg. = Segment, Acc. = Acceleration, Dec. = Deceleration, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.

B.6.6 Results for Special Case Analysis

Table B-12

shows the year 2020 traffic performance measures estimated in the AM and PM peak hours by direction of movement for scenarios with and without the El Camino Real improvement and with background traffic conditions based on the no change alternative. Note that the results are based on the travel conditions prior to the advent of California and SF Bay Area coronavirus / COVID-19 stay home orders of 2020.

Under existing traffic conditions, congestion and delays are seen on SR 85 segments in the northbound direction only in the AM peak hour. Converting the El Camino Real interchange from a cloverleaf to a diamond would result in the elimination of weaving delays within the El Camino Real interchange area, however it would also result in consolidating the off- and on-ramp volumes at this interchange to fewer ramps. The diverge area delay at the SR 85 northbound off-ramp for the diamond interchange can be mitigated by an increase in deceleration lane length. In this analysis an increase was assumed from 150 feet to 750 feet. Similarly, the merge area delay at SR 85 southbound on-ramp for the diamond interchange can be controlled by an increase in acceleration lane length. In this analysis an increase was assumed from 420 feet to 750 feet. Both these ramps are located south of the El Camino Real centerline.

There are limited opportunities to control the ramp delay added due to the traffic consolidation effect of the interchange conversion on the ramps north of the El Camino Real centerline. In the northbound direction, where traffic congestion is an issue, there are additional ramp traffic conflicts with large SR 85 northbound off-ramp traffic to SR 237 eastbound (over 1,500 vehicles in AM peak hour). The weaving area available for traffic entering via the SR 85 northbound on-ramp from El Camino Real and traffic exiting via the SR 85 northbound off-ramp to SR 237 eastbound is 460 feet. The VHD in SR 85 northbound directions increase by 54 percent, while the throughput and speed decrease by 8 percent and 19 percent, respectively.

Based on the geometric setting, a possible solution to reducing these traffic impacts would be to retain the SR 85 northbound loop on-ramp from El Camino Real while removing the SR 85 northbound loop off-ramp to El Camino Real. This will reduce the traffic consolidation effect and also eliminate weaving. This solution would result in a one leaf partial cloverleaf interchange instead of a diamond only interchange. Further analysis that is beyond the scope of this study would be needed to confirm the benefits.

Table B-12 2020 Traffic Performance Measures for El Camino Real Improvement under SR 85 Transit Guideway No Change Alternative (1-1)

Alt. #	Alternative Description	VMT (veh-mi) AM Peak Hour	VMT (veh-mi) PM Peak Hour	VHT (veh-hrs) AM Peak Hour	VHT (veh-hrs) PM Peak Hour	VHD (veh-hours) AM Peak Hour	VHD (veh-hours) PM Peak Hour	Av Spd (mph) AM Peak Hour	Av Spd (mph) PM Peak Hour	% Miles of Freeway LOS E or F AM Peak Hour	% Miles of Freeway LOS E or F PM Peak Hour	Miles of Congestion* AM Peak Hour	Miles of Congestion* PM Peak Hour
SR 85 Northbound Segments near SR 85 / El Camino Real Interchange													
1-1	Without El Camino Real Interchange Improvement	9,201	6,536	285	105	102	0	32.3	62.2	85%	0%	0.7	0.0
1-1	With El Camino Real Interchange Improvement	8,502	5,929	325	96	157	0	26.2	62.0	85%	0%	0.9	0.0
Change		-700	-608	40	-9	55	0	-6.1	-0.2	0%	0%	0.2	0.0
SR 85 Southbound Segments near SR 85 / El Camino Real Interchange													
1-1	Without El Camino Real Interchange Improvement	6,489	9,879	104	164	0	0	62.1	60.3	0%	0%	0.0	0.0
1-1	With El Camino Real Interchange Improvement	5,487	9,467	88	158	0	0	62.0	60.0	0%	0%	0.0	0.0
Change		-1,003	-412	-16	-6	0	0	-0.1	-0.3	0%	0%	0.0	0.0

*Based on GP Lanes - Peak Hour Peak 15-Minute Interval Estimates

AM Peak Hour: 7:45 am to 8:45 am; PM Peak Hour: 5 pm to 6 pm.

NOTE: Delay or congestion is assumed when speed on a segment falls below 45 mph (Caltrans threshold)

Source: Google Earth for SR 85 / El Camino Real (SR 82) Interchange No Build conditions; Traffic Counts by CDM Smith Sub-Consultant – Quality Counts, February 2020; Caltrans Traffic Census Counts; Caltrans PeMS; SR 85 Transit Guideway Study Phase 1 Report; HCS7 Software; CDM Smith Analysis and Assumptions for SR 85 / El Camino Real (SR 82) Interchange Build conditions.

Note: Seg. = Segment, Acc. = Acceleration, Dec. = Deceleration, AM Peak Hour = 7:45 am to 8:45 am, PM Peak Hour = 5 pm to 6 pm.