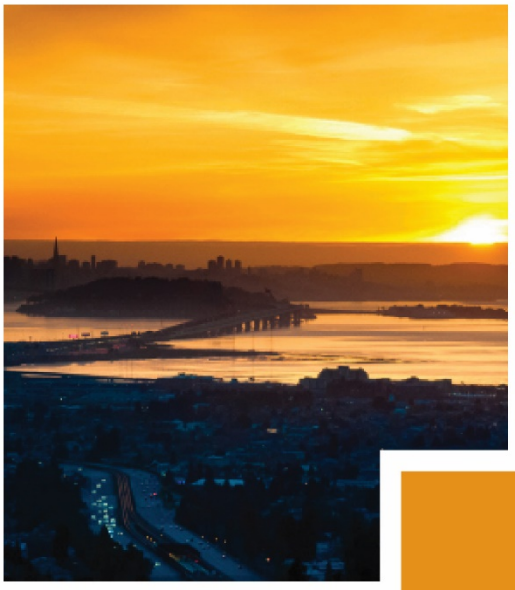

2018 Level of Service Monitoring Report

December 2018

ALAMEDA
County Transportation Commission

Alameda County Transportation Commission
1111 Broadway, Suite 800 • Oakland, CA 94607
510.208.7400 • www.AlamedaCTC.org

prepared by **Iteris, Inc.**

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2018
LEVEL OF SERVICE MONITORING

ON THE CONGESTION MANAGEMENT PROGRAM ROADWAY NETWORK

ALAMEDA COUNTY TRANSPORTATION COMMISSION

DECEMBER 2018

Prepared by Iteris, Inc.

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ES | Executive Summary

Congestion occurs when demand for a given roadway exceeds the available capacity. As congestion increases—and travel along the roadway continues to slow—fewer vehicles can get through and roadway capacity falls. Often this means that roadway speeds decline exponentially once congestion begins since demand for the road increases even as vehicle-capacity falls.

Congestion Management Agencies (CMAs) like the Alameda County Transportation Commission (Alameda CTC) apply a variety of tools to reduce congestion and restore roadway capacity such as: operational improvements like signal timing, strategic capital improvements, and travel demand management measures which get more people to ride transit and carpool can maximize existing capacity. A number of factors, which increase travel demand, are outside the direct control of CMAs, but also have a considerable influence on congestion: population growth, a healthy regional economy, land use changes, and fuel prices can all contribute to the level of congestion.

California law mandates that urban areas develop a Congestion Management Program (CMP) which describes the strategies used to assess, monitor, and improve the performance of each county's multimodal transportation system and integrate transportation and land use. Alameda CTC is the designated CMA for Alameda County and manages and updates the county's CMP. As part of the CMP, which has been in place since 1991, Alameda CTC monitors average roadway speeds, and the corresponding Level of Service (LOS), every two years on the county's designated CMP roadways. This report is the result of that LOS monitoring effort.

This report discusses both the performance of roadway segments and the trends that impact travel demand. This monitoring also gives Alameda CTC a better understanding of how Alameda County's key roadways (freeways, highways, and major arterial roads) perform and informs future transportation decisions. For 2018, this effort also includes transit performance, making it the first multimodal reporting effort.

Measuring Performance

An LOS grade is assigned to each roadway segment based on the segment's average speed using the Highway Capacity Manual (HCM) methodology. The LOS category relays information about the quality of service to drivers, and ranges from LOS A to LOS F. LOS A represents the fastest travel conditions for drivers, where roadways operate at free-flow speeds, and LOS F represents heavily congested or stop-and-go traffic conditions.

Average travel speed is measured on the entire CMP network during the afternoon peak-period (from 4:00 PM to 6:00 PM on Tuesday, Wednesday, and Thursday) and the morning peak-period (from 7:00 AM to 9:00 AM on Tuesday, Wednesday, and Thursday). Freeway travel speeds are also measured on the weekends (1:00 PM to 3:00 PM on Saturday and Sunday). This report also includes a chapter on transit monitoring (transit performance) that was conducted using bus Automatic Vehicle Location (AVL) and stop point data for the selected AC Transit and Livermore-Amador Valley Transit Authority (LAVTA) routes.

Since 2014, average travel speeds have been calculated using commercially available speed data that allows Alameda CTC to monitor large portions of the CMP network. This commercial speed data were obtained through a third-party data provider, INRIX, for the 2018 monitoring cycle as well. Prior to the 2014 monitoring cycle, speeds were calculated from travel time data obtained via floating car surveys. For 2018, floating car runs were only used where INRIX data were not available.

The CMP Network

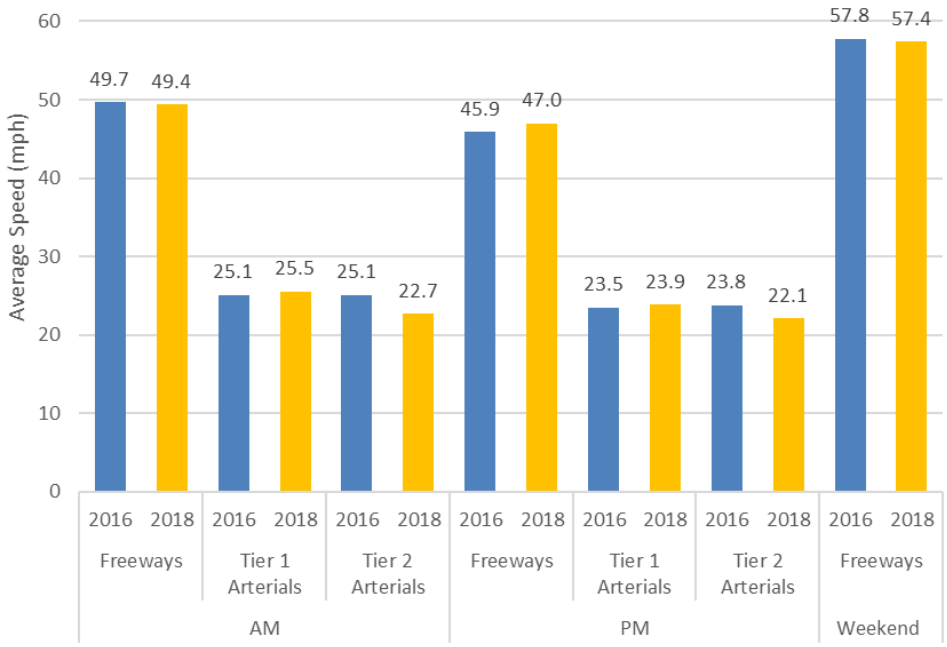
Alameda County's CMP network consists of approximately 553 miles of roadways, divided into two tiers (see Figure ES-1). The CMP network's Tier 1 roadways were initially adopted in 1991 and updated in 1992, and include all freeways, highways, selected principal arterials and freeway ramp connectors. Tier 2 roadways were added to the CMP network in 2011 and included additional principal and major arterials not already part of the CMP network. Alameda CTC added 225 miles of Tier 2 roads for the 2018 monitoring cycle. Alameda CTC also monitors LOS on the three bridges connecting Alameda County to San Francisco and San Mateo counties and freeway High Occupancy Vehicle and express lanes.

Figure ES-1: Alameda County CMP Network Details and Other Monitoring Elements

Roadway Performance in 2018

Although congestion remains widespread throughout Alameda County, the 2018 monitoring results indicate that average speeds on the CMP network have mostly stabilized since 2016. Speeds on some arterial roads, however, have continued to fall (results shown in Figure ES-2).

- **Freeways:** Average speeds on freeways increased slightly (+ 1.1 mph) in the afternoon peak-period, decreased slightly (-0.3 mph) in the morning peak-period, and decreased slightly on weekends (- 0.4 mph). Afternoon peak-period speeds were still 10 percent slower in 2018 than at the end of the recession (2010).
- **Tier 1 Arterials:** Tier 1 Arterials speeds increased slightly (+ 0.4 mph) during the afternoon peak-period and the morning peak-period.
- **Tier 2 Arterials:** Average speeds on Tier 2 arterials declined significantly in both the afternoon peak-period (-1.7 mph) and the morning peak-period (-2.4 mph). Since data collection began on Tier 2 arterials in 2014, speeds dropped 15 percent in the afternoon peak-period.



*Tier 2 – does not include additional segments added in 2018
*Tier 2 – source: Alameda CTC

Figure ES-2: Average Speeds on CMP Network – 2016 vs 2018

In 2018, the number of congested segments (operating at LOS F) decreased from 61 to 47 in the afternoon peak-period and from 37 to 32 in the morning peak-period. Figure ES-3 shows the locations of the LOS F segments in the afternoon and morning peak-periods, and active construction during the 2018 LOS monitoring period.

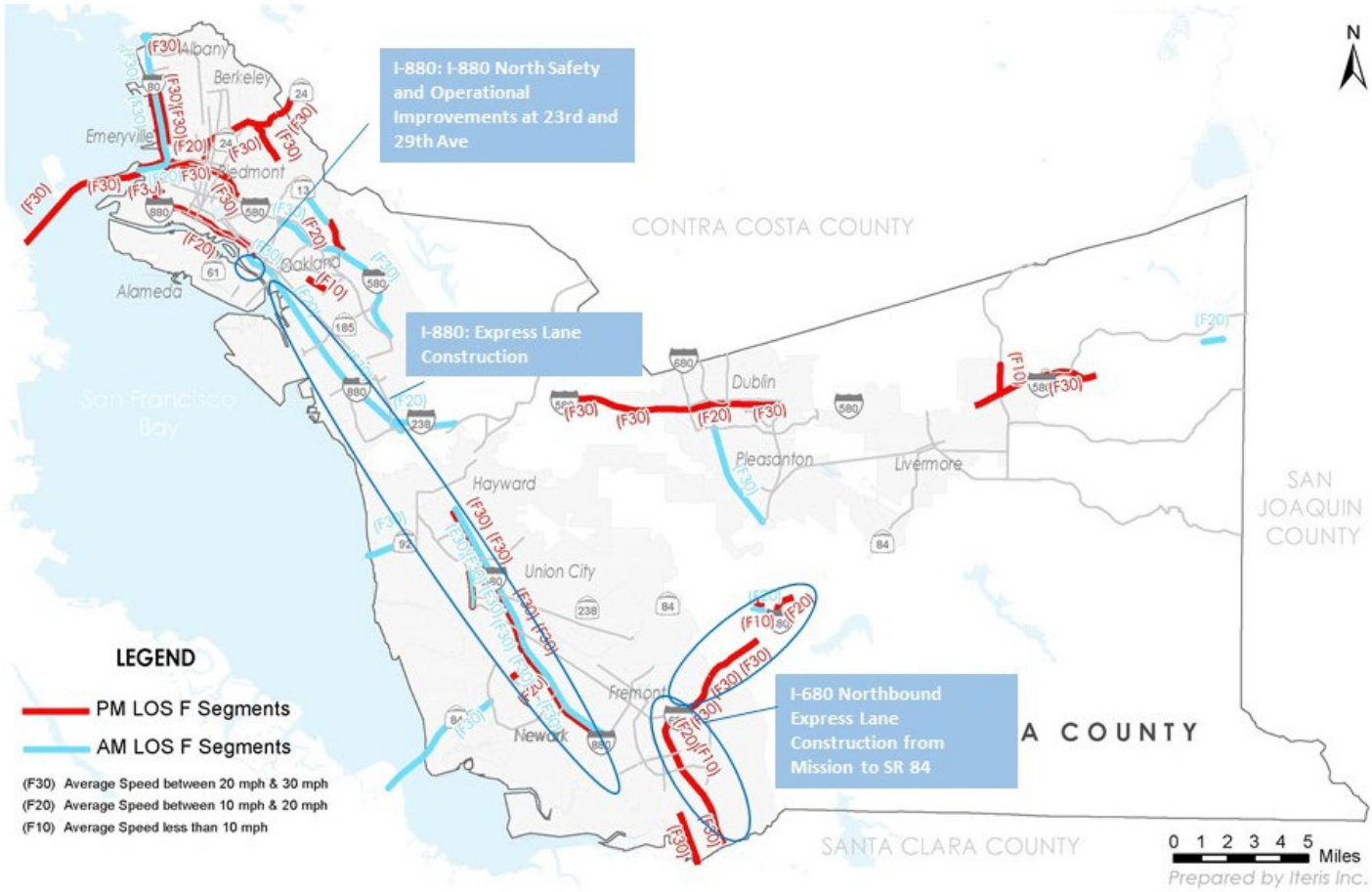


Figure ES-3: 2018 LOS Monitoring: Congested Segments in the Morning and Afternoon Peak-Periods and Active Construction

After considering applicable statutory exemptions (including interregional trips on segments that performed at LOS F during the 2018 LOS monitoring in the afternoon peak-period), no new deficient CMP segments were identified.

Transit Performance

The 2018 CMP reporting cycle is the first time Alameda CTC monitored transit performance on major bus transit corridors or truck lines, consisting of 20 transit routes on 146 miles of the CMP network. The transit routes

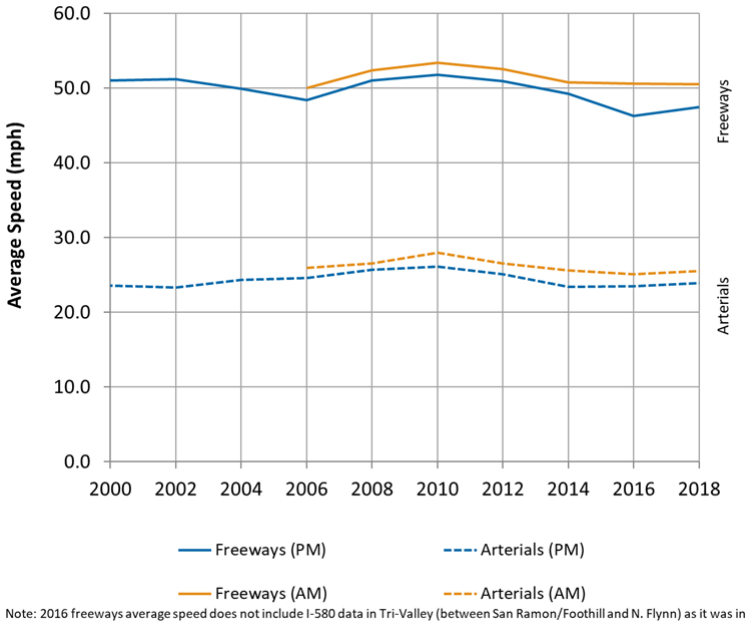
were first mapped to the CMP auto network (segmentation), and three performance measures were computed.

- Average speeds: The average speeds for LAVTA were noticeably higher than AC Transit during both the AM and PM peak-periods, given that LAVTA monitoring routes consists of rapid bus routes only (10R and 30R).
- **Transit-to-Auto Speed Ratio:** This study used a threshold approach to evaluate the buses operating on the same roadway segment during the AM and PM peak-periods. The transit-to-auto-speed ratio of 0.65 was defined as the threshold (meaning the bus speed is 35% slower than automobile along the same CMP segment), in accordance with Transit Capacity and Quality Manual. Most of the buses meets the threshold indicating bearable travel time difference, except 62.7 miles and 71.8 miles in the monitoring network during morning and afternoon peak–period.
- **Peak-Period-to-Off Peak-Period Transit Speed Ratio:** Comparing transit speeds during peak-periods to those during non-peak-periods, generally transit speeds during peak-periods were observed to be similar to off-peak-periods, with the exception of 1.33-mile monitoring segments during the morning peak-period and 1.28-mile during the afternoon peak-period.

Travel Demand Trends

Since the end of the recession, network congestion has increased significantly, influenced by a strong local and regional economy. Average speeds on the CMP network climbed through the recession, peaked in 2010, then returning to pre-recession lows in 2014 before dipping even lower in 2016. Figure ES-4a shows the average CMP network speeds on freeways and arterials between 2000 and 2018.

Employment and population levels have continued to rise in Alameda County since the end of the recession as travel speeds have fallen. Unemployment—a key indicator of the health of the regional economy—has continued to fall in Alameda County and in 2014 reached pre-recession levels (see Figure ES-4b).



Note: 2016 freeways average speed does not include I-580 data in Tri-Valley (between San Ramon/Foothill and N. Flynn) as it was in Express Lane ramp up period.

Figure ES-4a: CMP Network Speeds (mph)

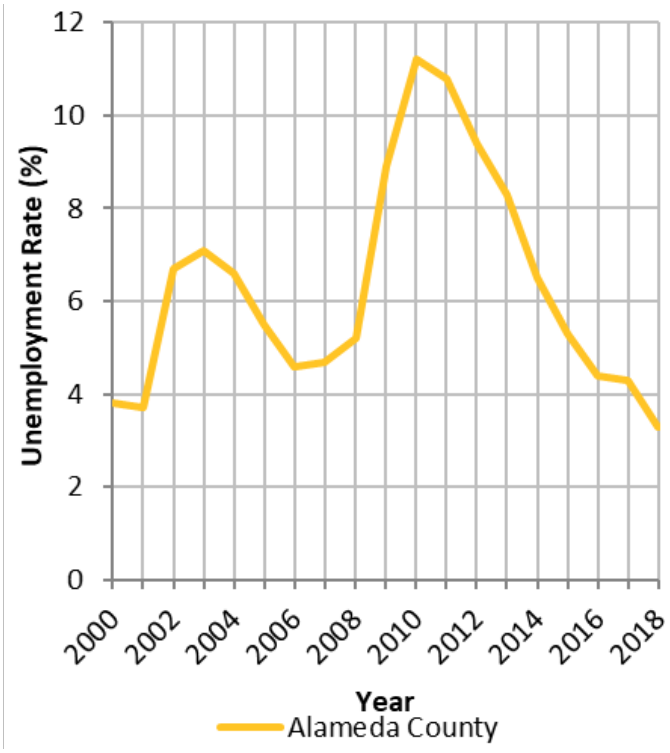
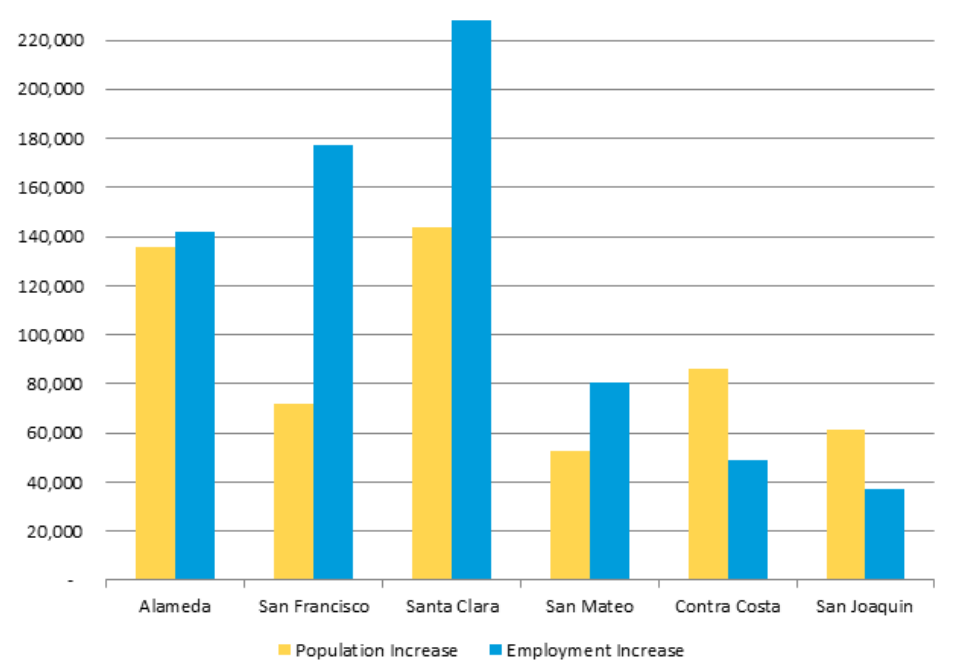


Figure ES-4b: Alameda County Unemployment Rate

Alameda County has added 135,000 jobs and 142,000 residents since the end of the recession. This strong growth has been shared throughout the region, but that growth has exacerbated a jobs and population imbalance in neighboring counties. In the counties to the west and south (San Francisco, San Mateo, and Santa Clara) job growth has outpaced population growth. In the counties to the north and east (Contra Costa and San Joaquin) – the opposite is true and population growth has outpaced job growth. Alameda County, in the middle of this regional imbalance, has shouldered an outsized role in the regional travel.



* Source: DOF E-5 Report 2016-17 estimate, Alameda CTC

Figure ES-5: Population and Employment Growth in Alameda and Neighboring Counties

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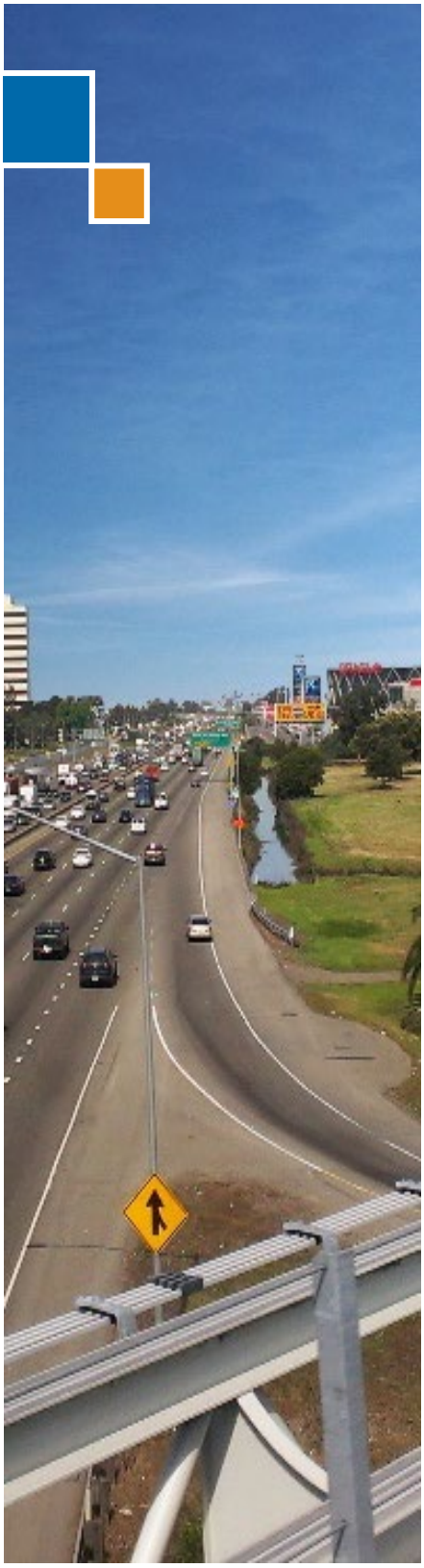
1 | Introduction

Every two years, Alameda CTC performs LOS monitoring on its CMP roadway network, as required by state law. This monitoring gives Alameda CTC a better understanding of how the county's key roadways perform and informs future transportation decisions. The 2018 monitoring effort also includes transit performance, making it the first multimodal effort. The objectives of the entire monitoring effort are to:

- Determine the average travel speed and existing LOS on roadways throughout Alameda County;
- Identify congested segments (i.e. those operating at LOS F); and
- Identify the long-term traffic congestion trends across the CMP network.



This report is organized into eight sections including appendices with supportive data and information. It summarizes the detailed data collection and performance assessment methodologies, including various data sources and processing steps, and presents a comprehensive assessment of the monitoring results and trends.

Section 1, this introduction, provides context for this LOS Monitoring Report. Section 2 summarizes the methodology used to collect travel-time data and the days of collection. Sections 3, 4, and 5 present the LOS monitoring results for freeways and arterial roadways, HOV/express lanes, and transit, respectively. Section 6 provides additional information on travel time reliability (big data performance metrics). Section 7 presents a comparison of the results and additional insight on economic, technology, and transportation trends that affect CMP network performance. Lastly, Section 8 provides recommendations on next steps and future improvements to both the CMP network and monitoring effort. The Appendices contain maps and tables of the LOS monitoring results (including transit) and additional details on the data collection methodology.

1.1 | The CMP Network

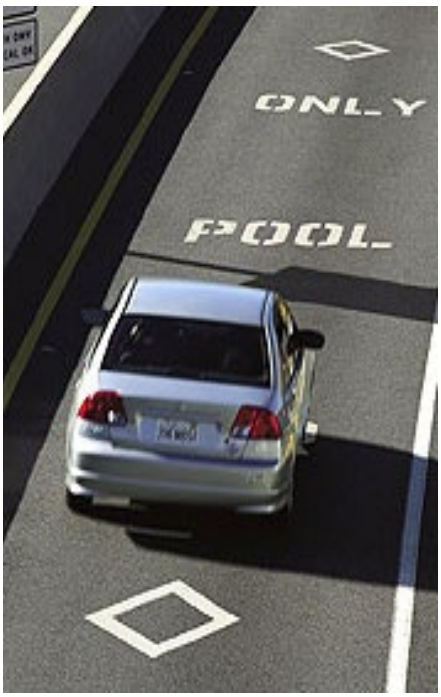
The 553-mile CMP network consists of five types of facilities: interstate freeways, state highways, principal arterials, major arterials, and rural roadways. The complete CMP network is shown in Figure 1-1. For the 2018 monitoring cycle, the Tier 2 network was expanded to 314 miles, with the addition of 225 miles of arterials and rural roadways. Also, 146 miles of transit major corridors that are part of the CMP network were added in 2018 monitoring cycle. Table 1-1 provides a summary of the distances monitored for each roadway type in the 2018 CMP LOS monitoring. Tables 1-2, 1-3 and 1-4 present the CMP segments and the monitored transit routes by jurisdiction. The Alameda County CMP network is divided into two tiers – Tier 1 and Tier 2. Tier 1 roadways are part of the CMP network

initially adopted in 1991 and updated in 1992. Tier 1 encompasses all six interstate freeways, all 11 state freeways and highways, 37 miles of principal arterials, and 23 ramp connections. These Tier 1 roadways are monitored for CMP conformity, which is also during the afternoon peak-period only. Data collected on the morning peak-period is for information only. Tier 2 roadways were added during an update to the CMP network in 2011 and in 2017, the Tier 2 network was expanded for this monitoring cycle. All Tier 2 roadways are monitored for informational purposes only.

Table 1-1: Alameda CTC CMP Network

CMP Network Category	Distance Monitored
Freeways (Tier 1)	140 miles[2]
Ramps & Special Segments (Tier 1)	23 connections
Arterials (Tier 1)[1]	99 miles[2]
Arterials (Tier 2)	89 miles[2]
Arterials (New Tier 2)	225 miles[2]
HOV/Express Lanes	98 miles (each direction included separately
Bridges	3
Transit	146 miles

[1] Includes 70 miles of state highways.
[2] As measured in 2018 based on actual changes to the network observed in the field and the updated GIS shape file for the CMP network.



Alameda CTC also separately evaluates LOS on ten High Occupancy Vehicle (HOV)/express lane routes covering 98 miles of freeway, as shown in Figure 1-2, and compares their performance to the average speed of all lanes. For this comparison, each direction of the HOV/express route is considered separately (start and end points are often different). Alameda CTC also monitors congestion levels on three bridges connecting Alameda County to San Francisco and San Mateo County. These bridges are monitored for informational purposes to understand travel to, from, and through Alameda County to San Francisco and the Peninsula.

Alameda CTC started monitoring transit network performance as part of the 2018 monitoring cycle. The CMP transit network consists of 146 miles of major transit corridors identified in the Countywide Transit Plan, Countywide Multimodal Arterial Plan and adopted in the 2017 Congestion Monitoring Program. These transit corridors include bus routes operating along major corridors by AC Transit and LAVTA. As part of the transit network monitoring, average peak-period bus speeds are compared with auto speeds on CMP segments. The CMP transit network is illustrated in Figure 1-3.

Table 1-2: Tier 1 – Alameda County CMP Designated Roadway Network Routes by Jurisdiction

Jurisdiction	Freeway	Miles	State Highway	Miles	Arterial	Miles
Albany	I-80	111	SR-123 (San Pablo Ave)	12	None	-
	I-580	8				
Berkeley	I-80	24	SR-123 (San Pablo Ave)	23	University Ave	21
			SR-13 (Ashby/Tunnel Rd)	35	Shattuck Ave, Adeline	18
Emeryville	I-80	12	SR-123 (San Pablo Ave)	5	None	-
Oakland	I-80	33	SR-123 (San Pablo Ave)	13	MLK Jr Blvd	14
	I-880	113	SR-13 (Tunnel Rd)	4	Hegenberger Rd	25
	I-980	25	SR-61/260 (Tubes)	6	29th Ave/23rd Ave	5
	I-580	117	SR-61(Doolittle Dr)	23	See Park St-Alameda	
	SR-24	46	SR-77 (42nd Ave)	4		
	SR-13	59	SR-185 (E 14th St)	40		
Piedmont	None	-	None	-	None	-
Alameda	None	-	SR-61 (Doolittle Dr, Otis, Broadway, Central, Encinal Ave)	39	Webster St	6
					Atlantic Ave	8
			SR-260 (Tubes)	8	Park St	10
San Leandro	I-880	39	SR-61 (Doolittle Dr)	9	150th Ave	5
	I-580	16	SR-61/112 (Davis St)	18	Hesperian Blvd	10
	I-238	5	SR-185 (E 14th St)	32		
Hayward	I-880	45	SR-185 (Mission Blvd)	6	A St	15
	SR-92	67	SR-238 (Mission Blvd)	48	Hesperian Blvd	27
			SR-238 (Foothill Blvd)	12	Tennyson Rd	24
			SR-92 (Jackson St)	17		
Union City	I-880	19	SR-238 (Mission Blvd)	31	Decoto Rd	18
Fremont	I-680	75	SR-238 (Mission Blvd)	48	Decoto Rd	12
	I-880	117	SR-262 (Mission Blvd)	16	Mowry Ave	28
	SR-84	38	SR-84 (Thornton, Fremont, Peralta, Mowry Ave)	107		
Newark	SR-84	24	None	-	None	-
Pleasanton	I-580	76	None	-	None	-
	I-680	36				
Livermore	I-580	56	SR-84	51	1st St	17
					Airway Blvd (old SR-84)	11
Dublin	I-680	19	None	-	None	-
Alameda County	I-680	84	SR-84 (Vallecitos Rd)	61	Hesperian Blvd	20
	I-580	194	SR-185 (Mission Blvd & E 14th St)	24		
	I-238	21	SR-238 (Foothill Blvd)	8		
	I-880	20				
Total (miles)		**139.7**		**69.7**		**29.0**

Table 1-3: Tier 2 – Alameda County CMP Designated Network Routes by Jurisdiction

Jurisdiction	Arterials	Miles	Arterials	Miles
Alameda	High St	11	Fruitvale Ave+	1
	Telegraph Ave*	11	Otis Dr+	2
	Broadway+	6	Park St+	4
	Constitution Way-8th St+	9	Santa Clara Ave+	23
	Fernside Blvd+	11	Tilden Way+	8
Alameda County	Altamont Pass Rd-Grant Line+	102	Castro Valley Blvd-Mattox+	27
	Grove Way	9	Tesla Rd+	119
	Tassajara Rd	5	Vallecitos Rd+	1
	Redwood Rd+	4	Vasco Rd+	3
	Lewelling Blvd+	14	A St*	6
	Livermore Ave+	6	Crow Canyon Rd	71
	N Canyons Pkwy-Portola+	5	Sunol Blvd-1st St-Stanley Blvd*	28
	Patterson Pass Rd+	89		
Albany	Buchanan St-Marin Ave+	16	Solano Ave+	9
Berkeley	Bancroft/Durant Ave	7	Durant Ave+	7
	College Ave*	12	Gilman St+	6
	Powell St–Stanford Ave	1	MLK Jr Way+	27
	Buchanan St-Marin Ave+	6	Shattuck Ave+	19
	Claremont Ave+	6	Solano Ave+	6
Dublin	San Ramon Rd	16	Dublin Blvd+	48
	Tassajara Rd	22	Fallon Rd+	28
	Dougherty Rd	19	Village Pkwy+	15
Emeryville	Powell St–Stanford Ave	6	40th St-Shellmound Ave+	15
Fremont	Alvarado-Niles/Smith/ Niles Blvd+	35	UC Blvd-Ardenwood-Newark Blvd+	15
	Auto Mall Pkwy+	24	Stevenson Blvd+	4
	Cherry-Boyce-Cushing+	32	Paseo Padre Pkwy+	23
	Fremont Blvd+	116	Walnut Ave+	18
	Gimmer Blvd+	51	Warren Ave+	1
	Mission Blvd+	3	Washington Blvd+	22
	Osgood Road-Warm Springs Blvd+	55		
Hayward	A St*	6	Industrial Blvd-Pkwy W+	51
	Hesperian Blvd-Union City Blvd*	16	Carlos Bee Blvd-Hayward Blvd+	9
	B St+	2	Tennyson Rd+	6
	C St+	2	Whipple Rd+	6
	Industrial Pkwy SW+	1	Winton Ave+	27
	Clawiter Rd+	17		
Livermore	E Stanley Blvd- Railroad Ave-1st St	24	N Canyons Pkwy-Portola+	47
	Altamont Pass-Grant Line+	9	Patterson Pass Rd+	12
	East Ave+	25	Livermore Ave+	27
	First St+	9	Vallecitos Rd+	24

Jurisdiction	Arterials	Miles	Arterials	Miles
	Isabel Ave+	9	Vasco Rd+	98
	Stoneridge Dr-Jack London Blvd+	25		
Newark	Central Ave+	8	Paseo Padre Pkwy+	15
	Cherry-Boyce-Cushing+	25	Thornton Ave+	37
	Mowry Ave+	8	UC Blvd-Ardenwood-Newark Blvd+	21
Oakland	12th St-Lakeshore Ave	24	7th St-E 8th St+	34
	College Ave*	1	8th St+	2
	E 15th St	1	98th Ave+	32
	Foothill Blvd	54	Airport Access Rd+	3
	High St	24	Broadway+	46
	Shattuck Ave*	8	Bush St+	9
	Telegraph Ave*	11	Casto St+	8
	14th St-Lake Merritt Blvd+	11	Claremont Ave+	11
	73rd Ave	11	E 12th St+	29
	51st St	8	E 18th St+	2
	14th Ave+	3	Fruitvale Ave+	23
	W Grand Ave to Grand Ave	31	Harrison St-Oakland Ave+	1
	20th St+	5	MacArthur-Santa Clara+	106
	23rd Ave+	3	Market St+	4
	29th Ave+	5	MLK Jr Way+	18
	40th St-Shellmound Ave+	12	Park Blvd+	3
	42nd Ave-Courtland+	4	San Leandro St+	43
	52nd St+	1	San Pablo Ave+	17
	55th St+	5	Santa Clara+	4
	5th St+	13	Seminary Ave+	7
	6th St+	13	Telegraph Ave+	22
	73rd Ave+	8		
Piedmont	Park Blvd+	2		
Pleasanton	Santa Rita Rd	12	Main St-Santa Rita Rd+	31
	Sunol Blvd-1st St-Stanley Blvd*	29	Stoneridge Dr-Jack London Blvd+	74
	Bernal Ave+	14	Owens Dr+	11
	El Charro Rd+	3	Neal St+	1
	Foothill Rd+	7	W Las Positas Blvd+	2
San Leandro	Estudillo Ave+	1	San Leandro Blvd+	22
	Lewelling Blvd+	15	Washington Ave+	27
	MacArthur-Santa Clara+	1	Wicks Blvd-Merced St+	22
	Marina Blvd+	18		
Union City	Hesperian Blvd-Union City Blvd*	13	UC Blvd-Ardenwood-Newark Blvd+	21
	Dyer St+	12	Whipple Rd+	28
	Alvarado-Niles/Smith/Niles Blvd+	53		
Total (miles)				**314**

*Roadway traverses more than one jurisdiction

+ Includes roadway segments (New Tier 2) added in the 2018 Monitoring

Table 1-4: Transit Monitoring Network

Jurisdiction	Agency	Routes	Miles
Alameda	AC Transit	51A/51B 20/21	7.2
Alameda County	AC Transit	40 97	7.9
	LAVTA	10R 30R	
Albany	AC Transit	72/72M/72R 18	2
Berkeley	AC Transit	72/72M/72R 18 6 51A/51B F	14.1
Dublin	LAVTA	30R	4.9
Emeryville	AC Transit	72/72M/72R F 57/NL	1.2
Fremont	AC Transit	99	17.4
Hayward	AC Transit	97 99 10	10.3
Newark	AC Transit	U, DB, DB1	2.3
Oakland	AC Transit	72/72M/72R 18 6 51A/51B F 57/NL 40 1 20/21 10	51.8
Pleasanton	LAVTA	10R	5.1
San Leandro	AC Transit	40 10 97 99	4.1
Union City	AC Transit	97 99/10	8.2
Livermore	LAVTA	10R 30R	9.5
Total (miles)			**146**

Figure 1-1: Alameda County CMP Network

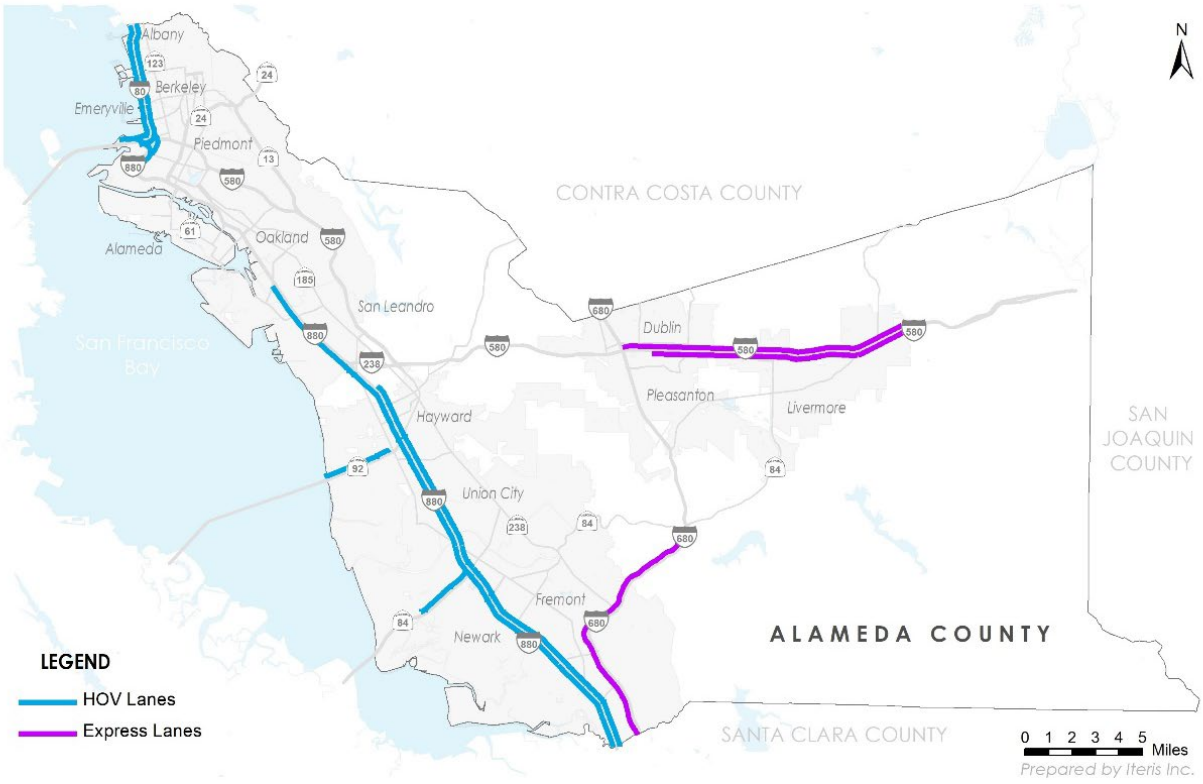


Figure 1-2: Monitoring of HOV/Express Lanes

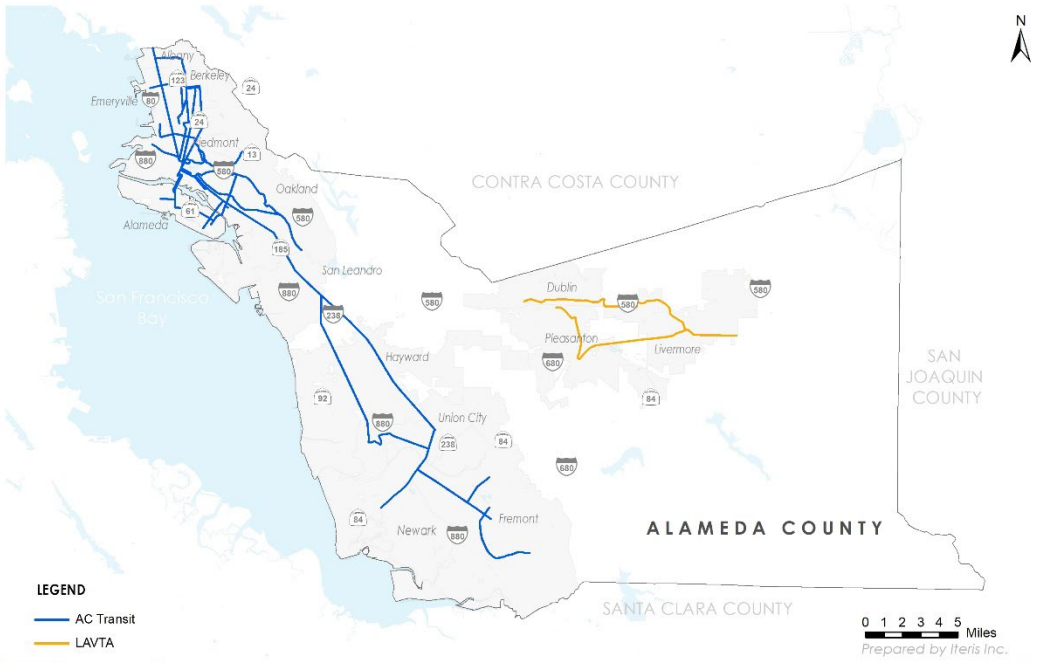


Figure 1-3: Monitoring of Transit Routes

1.1.1 | Changes to CMP Network and Monitoring in 2018

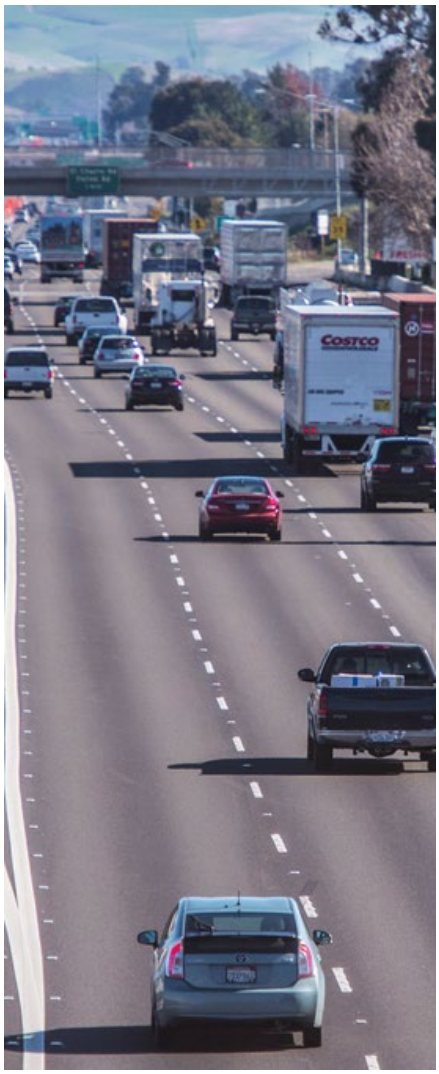
During each CMP update, Alameda CTC reviews the CMP network for potential updates including expansion or other needed changes such as scope or extent of monitoring, which will be implemented in the following monitoring cycle. The following is a summary of key changes and updates made in the 2017 CMP document regarding the scope of the biennial monitoring element, which is implemented in the 2018 monitoring cycle:

- **Expanding the LOS Monitoring to be Multimodal Performance Monitoring**: Transit monitoring has been introduced as part of the 2018 CMP monitoring cycle in addition to the typical LOS Monitoring. The performance of 20 bus routes along a 146-mile transit corridor network that are part of the CMP roadways were added to the monitoring network, based on the outcome of the three countywide modal plans - the Countywide Multimodal Arterial Plan, Countywide Transit Plan, and Countywide Goods Movement Plan adopted by the Commission in 2016. They were monitored using three performance measurements (average speed, average bus speed to average auto speed ratio, and peak-period to non-peak average bus speeds ratio) established in consultation with AC Transit and LAVTA.
- **Changes to the designated monitoring network:** The Tier 2 network was expanded to add approximately 225 miles of arterial roadways in conjunction with the outcome of the above three

countywide modal plans. In measuring the free-flow speeds, Tier 2 arterial segments were classified as 1 to 3 for further Level of Service assignment.

1.1.2 | Segmentation of CMP Network

For LOS monitoring purposes, the entire CMP network is divided into short lengths of roads called CMP segments. The limits for the freeway segments are typically at major interchanges. Where traffic volumes entering and exiting the freeway were minor, the length between three or more sections were combined into longer segments. However, land use changes over time can impact traffic patterns significantly. In some cases, Alameda CTC reviews the segment limits and, if needed, divides the segments further. For example, the I-580 corridor in the east county was re-segmented in 2007 to develop shorter segments reflecting the change in land use occurred since 1991. For arterials, break points between segments generally occur at:



- Jurisdiction boundaries;
- Points where the number of travel lanes change;
- Major arterial street crossings; and
- Points where land use, speed limit or channelization schemes change significantly.

Segment boundaries for arterial roadways are identical for both directions and the distances are generally the same or sufficiently similar so as to be considered equal. However, the distances for each direction of the same segment may differ slightly in cases of very wide intersections or when the street crossings are staggered.

Additionally, Alameda CTC classified the arterials in order to determine LOS. For this purpose, each section between two adjacent signals was first reviewed to determine its arterial class as Class I, II, or III. Arterial class is based on access control, land use intensity, free-flow speed and other factors as defined in the 1985 HCM with the exception of HCM 2000 for Tier 2.

1.2 | LOS Standards and CMP Conformity

Alameda CTC performs LOS monitoring by measuring the average speed of traffic across each CMP segment. Based on the average speed, Level of Service is determined from LOS A to LOS F. LOS A represents the fastest travel conditions where roadways are uncongested, and LOS F represents congested conditions or deteriorated traffic flows. These standards are based on the HCM.

Tier 1 roadways that report LOS F conditions in the afternoon peak-period are further analyzed under special requirements (CMP conformity). Based on the analysis, if the roadway is identified to be deficient, state legislation

requires the respective local jurisdiction to prepare a deficiency plan that details the cause of the deficiency, identifies measures to improve the performance of the roadway, and a funding plan for the proposed improvements. A roadway may be exempt from being identified as deficient for the following reasons:

- It operated at LOS F in the base monitoring year (1991 and 1992 when the CMP network was formed) and is therefore *grandfathered* in at LOS F;
- It is located within an Infill Opportunity Zone;
- Construction activities affected the normal flow of traffic;
- It carries a certain volume of interregional trips (analysis performed using the Alameda Countywide Travel Demand Model);
- It is impacted due to freeway ramp metering or recent traffic signal coordination;
- It operated at LOS F due to traffic generated by developments such as low-income housing, a high-density development, or a mixed-use development subject to certain criteria.

As shown in Table 1-5, only the Tier 1 CMP network in the afternoon peak-periods is subject to LOS conformance and associated deficiency planning (where applicable). All other monitoring and data collected are used for information purposes only.

Table 1-5: CMP Network Monitoring Periods and Purpose of Monitoring

Tier	Time Period	CMP Category	Purpose
Tier 1	PM	Freeways	Legislative Conformity
		Arterials	
		Ramps & Special Segments	
	AM	Freeways	Informational only
		Arterials	
		Ramps & Special Segments	
	Weekends	Freeways	
Tier 2	AM and PM	Arterials	
Other	AM and PM	HOV & Express Lanes	
		Transit	

1.3 | What's New in this Monitoring Cycle regarding Data Collection and Methodology

For this monitoring cycle, as in 2016, commercial speed data was used to analyze Tier 1 freeways and ramps. These data were supplemented with floating car surveys where commercial speed data was unavailable. The commercial speed data used in this monitoring was provided by INRIX,

Inc., a data service provider that collects real-time traffic data from Global Positioning System (GPS)-enabled devices (mobile phones, connected cars, and commercial vehicles). INRIX aggregates the individual GPS data points onto a unique set of roadway segments, which are TMC (hereafter "INRIX TMC data"), or XD segments (hereafter "INRIX XD data"). Each INRIX data record represents the average speed of vehicles travelling along one particular TMC or XD segment in a one-minute interval. For detailed data processing procedure, refer to Appendix E and Chapter 2.2.1.

Prior to the 2018 monitoring effort, the project team examined commercial speed data and floating car data from the previous monitoring cycle, and found that commercial speed data (provided by INRIX) was more aligned with field data collected for the same time periods. Based on the outcome of that analysis, Alameda CTC used commercial travel time data provided by INRIX as the primary source for average speed and LOS calculations for all Tier 1 and Tier 2 segments where sufficient spatial and temporal data coverage was available to provide stable and reliable average morning and afternoon peak-period speeds.

Floating-car surveys were used to supplement commercial speed data only for CMP segments where commercial data was not available or reliable for Tier 1 arterials and HOV lanes/express lanes. For Tier 2 arterial segments, only commercial data was used. The data used in the 2018 Monitoring is summarized as follows:

- Tier 1 Freeway: INRIX data
- Tier 1 Ramps: Floating car surveys
- Tier 1 HOV and Express Lanes
    - I-580: ACTC Electronic Toll System (ETS)
    - Others: floating car surveys
- Tier 1 Arterials
    - Atlantic Avenue, Mowry Avenue, Martin Luther King Jr. Way, SR-238 (between I-580 and Foothill Boulevard): floating car surveys
    - Others: INRIX data
- Tier 2 Arterial: INRIX data
- Transit Monitoring Network
    - AC Transit: AVL; incident log
    - Livermore Amador Valley Transit Authority (LAVTA): running time, bus stop points.

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2 | Methodology

This section discusses the methodology followed for measuring LOS in the current monitoring cycle. In the first step, Alameda CTC screened days within the monitoring period of February to June 2018 to ensure that automatically collected data used were only for days that were expected to result in normal commuter traffic conditions. Days that may have produced lighter than usual traffic conditions (such as public holidays) or heavier than usual conditions (such as special events) were identified and removed. Similarly, field data collection days were identified based on local events and school holidays to ensure representative travel conditions.

The second step consisted of the actual data collection using either probe-vehicle based commercial speed data, transit Automatic Vehicle Location (AVL) data, freeway express lanes ETS data, or floating car survey data. Data was collected for the Tier 1 and Tier 2 CMP arterial network, freeway HOV and express lanes and the transit CMP network.

In the final step, data was analyzed separately for commercial speed data, floating car surveys and AVL data to obtain LOS using HCM methodologies and compute transit performance measurements.

2.1 | Screening for Data Collection Periods

As a preliminary step in the analysis, it was necessary to identify all the days and time periods during which the CMP network could be monitored. Again, for 2018 travel time data was collected using a combination of commercial speed data and floating car surveys. Monitoring days for both data sources were reviewed and identified separately.

As a part of the preliminary analysis, all potential factors that may affect average traffic speeds were carefully examined. School holidays and special events that occurred during the monitoring period where identified and removed. This analysis was necessary to identify data generally representative of normal conditions on the CMP network for the current monitoring cycle.

2.1.1 | LOS Monitoring Times

LOS monitoring data is collected in spring when schools are in session. Commercial speed data collection and floating car surveys were conducted in the months of March, April and May, 2018. Where additional floating car surveys were required, some data collection efforts extended into the first week of June, but were completed before schools closed for summer.

Weekday data was collected on Tuesdays, Wednesdays and Thursdays between March 1, 2018 and May 10, 2018 for the morning and afternoon

peak-periods (see Table 2-1). The morning peak-period was from 7:00 AM to 9:00 AM, and the afternoon peak-period was from 4:00 PM to 6:00 PM. This resulted in a total of 31 monitoring days from which additional days were excluded for public holidays and school spring break. Freeways (Tier 1) were also monitored separately on weekends between 1:00 PM to 3:00 PM, which were verified in earlier monitoring cycles to be the weekend peak-period.

Base Monitoring Dates	Day of Week	Peak-Period	Time
March 1, 2018 - May 10, 2018	Tuesdays, Wednesdays, Thursdays	AM	7:00 to 9:00
		PM	4:00 to 6:00
	Weekends	PM	1:00 to 3:00

Table 2-1: CMP Monitoring Peak-Period

Figure 2-1: Alameda County Public Holidays, Spring Break and Events

All potential factors that may adversely impact traffic conditions were examined so monitoring results are an accurate reflection of the average driving conditions experienced by daily commuters. The following sections describe each of these screening steps in more detail.

2.1.2 | Public Holidays and Spring Breaks

Roads are typically less congested on public holidays and during school spring break periods. Public holidays were reviewed and none occurred on Tuesdays, Wednesdays and Thursdays in 2018. The spring break periods for Alameda County schools varied by school district and occurred as early as April 2nd and ended as late as April 13th. For spring break periods, data was not collected on the arterial network within the school district boundaries during their designated spring break. However, travel time data collection on the freeway and ramp networks continued during spring break periods as these facilities were expected to serve more inter-county and interregional traffic. Figure 2-1 shows public holidays and spring break periods during the 2018 data collection period.

2.1.3 | Special Events

Special events typically produce more congestion, especially on roadways near the event area, thus traffic data associated with special events was removed from the dataset.

While there were some significant regional events, the majority of the events did not occur within the monitoring period. Events at the Oracle Arena and the Oakland-Alameda Coliseum, such as Warrior basketball games and Oakland A's baseball games or concert performances were notable exceptions (see Figure 2-1). Games were played on a number of Tuesdays, Wednesdays, and Thursdays starting at 12:35 PM, 7:05 PM, or 7:30 PM. These games could have had an impact on the afternoon peak-period and therefore data for all the relevant CMP segments near or

approaching Oracle Arena were excluded in the afternoon peak on these event days.

2.1.4 | Weather Events

Weather events were also considered as a part of the analysis, however, no events were observed to impact traffic conditions, although some floating car surveys were rescheduled as a precaution.

2.1.5 | Construction and Maintenance

The project team reviewed various information sources to identify significant construction impacts during the monitoring period. These included the following:

- Alameda CTC projects webpage;
- Other government websites (including Caltrans District 4);
- Specific construction project websites;
- Facebook and Twitter feeds (such as the 511 SF Bay Twitter Feed[1]); and
- Caltrans Performance Measurement System (PeMS) lane closure database.

Both long and short term construction activities were identified. As an example of a long-term construction activity, I-680 NB experienced ongoing express lane construction. In this instance, there would not be adequate alternative days to gather a suitable sample size if all the days impacted by construction were removed. Therefore, data collection days were not restricted based on such long term construction. Table 2-2 lists segments impacted by ongoing long term construction.

Short term construction activities were reviewed and evaluated separately. For example, one lane on Southbound (SB) I-680 from Stoneridge Drive to Bernal Avenue was closed from Wednesday, May 9th to Thursday, May 10th. Data collected on May 9th on that particular CMP segments impacted by construction were removed from the monitoring data set to eliminate the potential construction impact on the traffic flows. Given the short duration of the construction activities compared to the total monitoring period, the remaining data provided an adequate sample size for monitoring.

Facebook news feeds from cities, major projects

Twitter news feeds from cities, major projects

Caltrans lane closure database

PeMS lane closure database & incident feeds

[1] Twitter Feed for 511 SF Bay twitter.com/511SFBay

Table 2-1: Long-term Construction Projects active during Spring 2018 LOS Monitoring

Tier	Impacted Roads	Extents	Description of Work
Freeway (Tier 1)	I-580	At I-80/I-880	Replace Structural Sign Panels
Freeway (Tier 1)	I-580 EB	Between Fruitvale Ave and Harold St	Road Construction
Freeway (Tier 1)	I-580 WB	From Patterson Pass Rd to Stoneridge Ave	Road Construction
Freeway (Tier 1)	I-580 WB	From I-580 /I-980 to I-580/I-80	Road Construction
Freeway (Tier 1)	I-680 NB	At SR-237 and North of I-580	Express Lane Construction
Freeway (Tier 1)	I-680 NB	From Rte 262 to Rte 238	Road Construction
Freeway (Tier 1)	I-680 NB	From County Line to SR-84	Road Construction
Freeway (Tier 1)	I-680 NB	From Scott Creek Rd to Auto Mall Pkwy	Road Construction
Freeway (Tier 1)	I-680 NB	From Vargas Rd to Alcosta Blvd	Ramp Metering
Freeway (Tier 1)	I-680 SB	Between Auto Mall Pkwy and Koopman Rd	Road Rehabilitation
Freeway (Tier 1)	I-680 SB	From Walnut Creek to I-580	Express Lane Construction
Freeway (Tier 1)	I-80 EB	From Potter St on-ramp to University Ave off-ramp	Road Construction
Freeway (Tier 1)	I-80 EB	From Toll Plaza to I-80/I-780	Road Construction
Freeway (Tier 1)	I-880 NB	Between SR-237 and Hegenberger Rd	Express Lane Construction
Freeway (Tier 1)	I-880 NB	From Fremont Blvd and High St	Median Barrier Construction
Freeway (Tier 1)	I-880 NB	From 29th Ave to 23rd Ave	Road Construction
Freeway (Tier 1)	I-880 NB	From 7th St to Grand Ave	Road Construction
Freeway (Tier 1)	I-880 NB	From Fremont Blvd to A St	Road Construction
Freeway (Tier 1)	I-880 NB	From Washington Ave to High St	Road Construction
Freeway (Tier 1)	I-880 SB	From Hegenberger Rd to Dion Landing Rd	Express Lane Construction
Freeway (Tier 1)	I-880	At Warren Ave	Road Construction
Freeway (Tier 1)	I-880	At Hegenberger Rd	Road Construction
Freeway (Tier 1)	I-880	At Doolittle Dr	Road Construction
Freeway (Tier 1)	I-880	At Airport Access Rd	Road Construction
Freeway (Tier 1)	I-980 NB	From I-980/I-880 to SR-24	Road Construction
Freeway (Tier 1)	SR-13 NB	At Moraga Ave on-ramp	Road Construction
Freeway (Tier 1)	SR-13 SB	From SR-24 to I-580	Road Construction
Freeway (Tier 1)	SR-13	01 mile south of Carson St	Plant Establishment
Freeway (Tier 1)	SR-24 WB	From I-580 to Skyline Blvd	Road Construction
Freeway (Tier 1)	SR-84 NB	From Ruby Hill Dr to Concannon Blvd	Express Lane Construction
Freeway (Tier 1)	SR-84	At Marshland Rd	Road Construction

2.1.6 | Incidents

Incidents (collisions, broken down vehicles, etc.) negatively impact traffic conditions, and therefore data associated with those incidents was excluded. For floating car surveys, where the driver observed an incident, the floating car survey run was repeated. For commercial speed data, freeway incident data sets from the Performance Monitoring System (PeMS) were reviewed and the speed data records for the time period corresponding to an incident were removed across all relevant CMP segments. Figure 2-2 shows a heat map of freeway incidents using data from PeMS and qualitatively indicates incident hot spots. Locations with higher densities of incidents are shown in red.

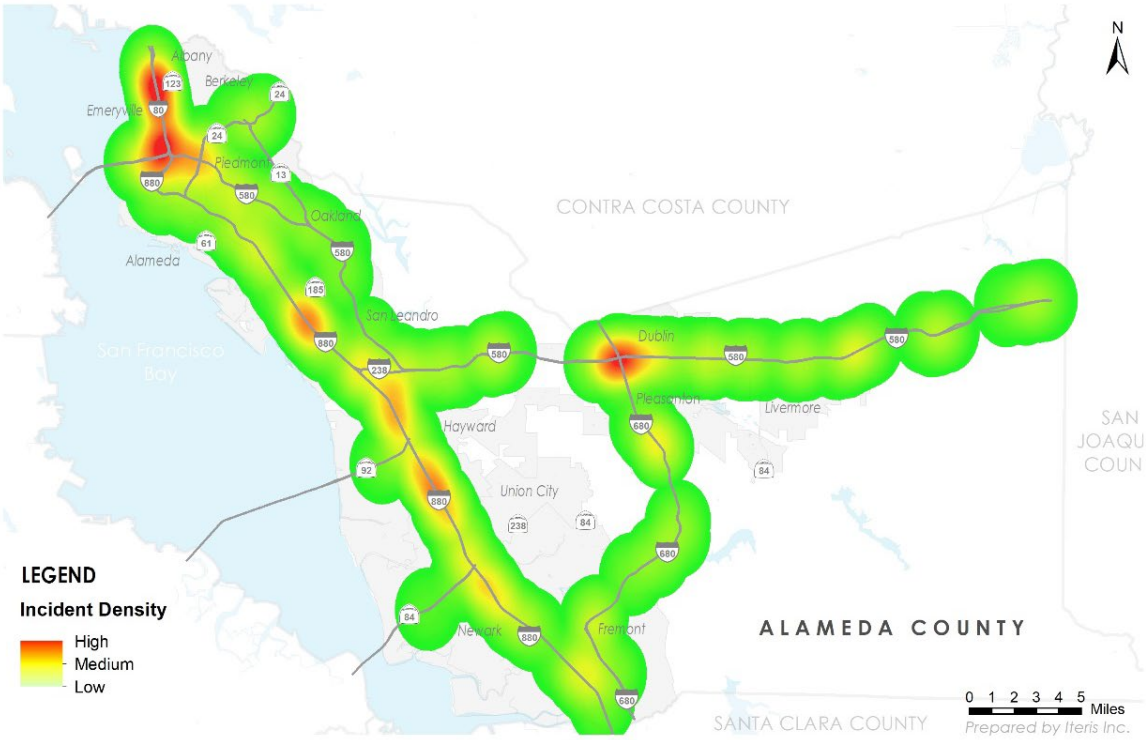


Figure 2-2: Incident Density Heat Map (Source: Freeway PeMS Incident Data, 2018)

Locations with a high incident density reported as many as 80 to 100 incidents during the monitoring period. Locations with medium incident density, such as the MacArthur Maze and the interchange area of I-880/SR-112, reported around 30 to 40 incidents each during the monitoring period. Other locations with low incident densities, including I-680 along the Sunol Grade and I-580 in East County between Livermore and the Altamont Pass, reported fewer than 15 incidents during the monitoring period.

2.2 | Data Collection

As in the 2016 LOS Monitoring cycle, Alameda CTC used both probe vehicle-based commercial speed data and floating car survey data to measure average speed to determine the LOS. Table 2-3 summarizes the source of travel time data for each category of CMP segment. See also Figures 2-3 and 2-4.

Table 2-3: Summary of Data Collection Methods

CMP Network Category	Miles	2016 Data Collection	2018 Data Collection
Freeways (Tier 1)	140 miles	Commercial data	Commercial data
Ramp and special segments (Tier 1)	23 connections	Commercial data[1]	Commercial data[1]
Arterials (Tier 1)	99 miles	Floating car surveys	Commercial data[2]
Arterials (Tier 2)	89 miles	71 miles commercial data 18 miles floating car surveys	79 miles commercial data
Arterials (New Tier 2)	225 miles	--	157 miles commercial data
HOV/express lanes	86 miles	Floating car surveys	HOV lanes – floating car surveys I-680 express lanes – floating car surveys I-580 express lanes – ETS
Transit	146 miles	--	AVL data / stop point data[3]

[1] Data for three segments collected using floating car surveys.
[2] Data for ten segments collected using floating car surveys.
[3] AC Transit collects AVL data while LAVTA stores Stop Point data.

Figure 2-3: Data Collection Methodology, Automobile Monitoring (2018)

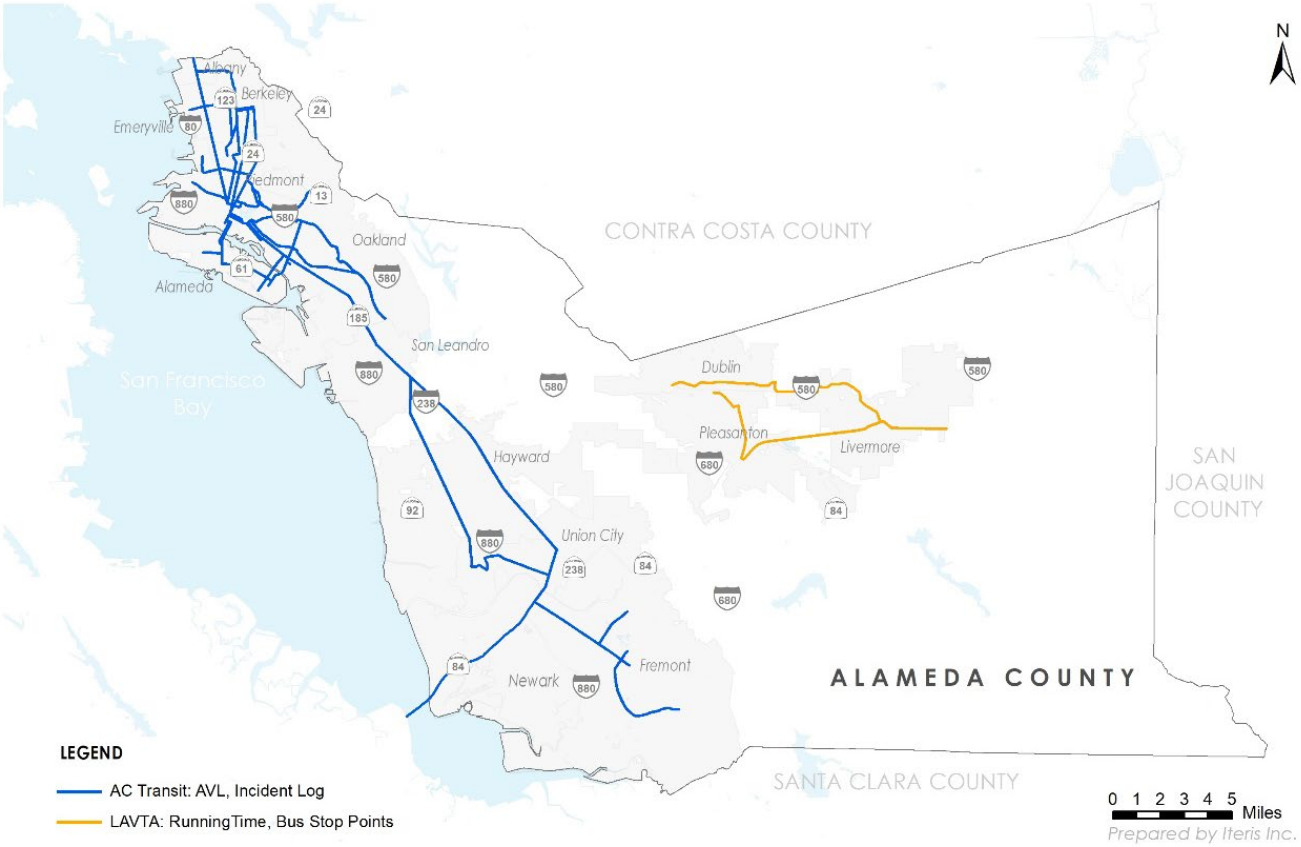


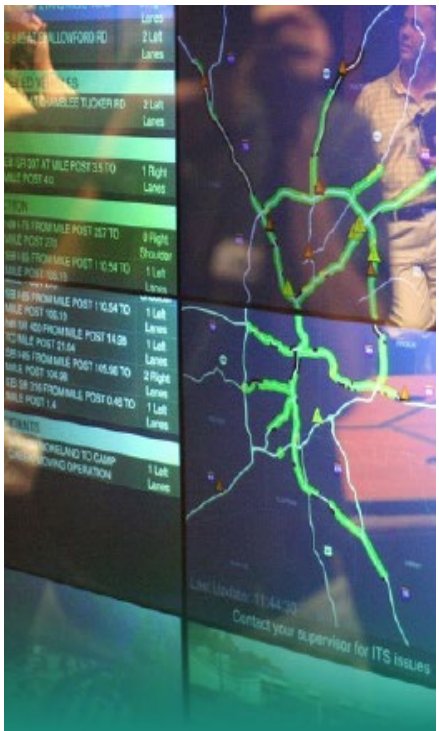
Figure 2-2: Data Collection Methodology, Transit Monitoring (2018)

2.2.1 | Commercial Speed Data

In 2013, MTC contracted with a third-party commercial data vendor, INRIX, to obtain region-wide commercial speed data, and has made the data available free of charge to CMAs and other local governments for planning and monitoring purposes. This LOS Monitoring effort used the commercial speed data from INRIX through MTC's contract.

INRIX "aggregates traffic data from GPS-enabled vehicles and mobile devices, traditional road sensors and hundreds of other sources."[2] Traffic data is reported by INRIX using discrete roadway links defined as Traffic Message Channels (TMCs). Each TMC link is associated with a unique ID represented by a nine-digit code, where each individual number in the TMC code describes a portion of the geography including country, direction of travel, and roadway segment. INRIX data contains speeds aggregated at the one-minute level for each TMC code in the network. For the current monitoring period, data at one minute intervals was accessed for the selected monitoring times across all identified TMCs in Alameda County. This resulted in a sample size of approximately 3,500 data points for the majority of CMP segments. Furthermore, the segments

[2] INRIX. http://inrix.com



along SR-84 between Mission Boulevard and I-580 were monitored using the commercial speed data coded to INRIX high-definition (XD) roadway network. This dataset was proven to greatly increase granularity for spatial conflation as compared to TMC code coverage which allowed Alameda CTC to preserve existing CMP segmentation. Appendix E provides technical details about this data collection.

2.2.2 | Floating Car Survey Data

Where commercial speed data lacked either spatial or temporal coverage, floating car surveys were used. The floating car surveys were completed using GPS technology to determine the travel time between the start and end of each CMP segment. For each of these CMP segments on the arterials (Tier 1) and HOV/express lanes, the study completed six floating car surveys. Several freeway ramps, which were not covered by commercial data, were also measured using floating car survey. If a CMP segment that used floating car surveys experienced congestion (LOS F) in the afternoon peak and the segment was subject to CMP conformity, then two additional runs were generally completed. Appendix F provides additional technical details on the floating car data collection effort.

2.2.3 | Transit Data

Transit speed monitoring was performed using data provided by AC Transit and LAVTA. Each agency provided a primary data source for measuring speeds: AC Transit provided data from AVL units on their busses and LAVTA provided manually collected Running Time data.

AC Transit has onboard GPS devices in buses that keep track of geospatial movement throughout the network. These GPS devices monitor and archive the bus location (its longitude and latitude) and a date-time stamp of when the Longitude/Latitude data were recorded. In addition, each AVL record contains a unique bus identifier number that can be used to pinpoint and follow each bus's travel time and speed along its route. To be able to interpret AVL data, the AC Transit Incident Log dataset was used to correlate the AC Transit route number and direction of travel for the AVL entries.

In summary, the AVL data shows snapshots of bus locations along the routes. They are called snapshots because each data record identifies one bus location at one specific point in time, like a series of photos or snapshots, rather than being a continuous recording. The time interval between data recordings is not necessarily constant, and can differ between from one bus to another and may be different for the same bus from day to day. Analysis of the snapshot data showed that the time interval between the AC Transit recordings vary from a few seconds to several minutes.

AVL data were not available for LAVTA's buses along the CMP routes, as LAVTA currently does not have AVL units on their busses. LAVTA provided what is commonly called Running Time data, which is aggregated travel time between major bus stops. The LAVTA data was averaged over 15-minute periods for each route per direction. The Bus Route and Stop Point data were provided by LAVTA in General Transit Feed Specification (GTFS) data files. The GTFS data contained the location (Longitude and Latitude) of LAVTA bus stops. Using the AC Transit and LAVTA data, weekday average peak-period and off-peak transit speeds were calculated for 146 miles of CMP arterial roadways.

Additional information (such as published bus route maps and bus schedules) were used during the analysis to clean, filter, and interpret the location data, and to perform reality checks as well as quality control on the data and resulting transit speeds. The following list documents the datasets used for monitoring transit speeds on CMP segments:

- **AC Transit Data:** AVL, incident logs, AC Transit bus route maps and schedules, and bus route GIS shapefiles.
- **LAVTA Data:** Running times, bus routes, bus stops points, LAVTA bus route maps/schedules.

2.3 | Data Analysis

The methodology for deriving LOS from raw commercial speed and floating car survey data includes two key steps. The first step consists of converting the raw speed data into average peak-period speeds on every CMP segment. In the second step, average speeds are utilized to determine LOS using a specific method depending on the type and classification of roadway.

2.3.1 | Auto Data Analysis

Calculate Average Peak-period Speed

The steps for converting raw speed data to average peak-period speeds vary based on the data source.

- **Commercial Speed Data:** Once collected from the INRIX database, commercial speed data points were associated with the appropriate CMP segment through a spatial mapping process. Next, data outside the monitoring period and data with poor data quality were eliminated. To calculate average speed for all data points, the data was averaged on each CMP segment for each peak-period. See additional technical details in Appendix E.
- **Floating Car Survey Data:** Once floating car survey data was collected using GPS units, it was processed to extract the average speed and travel time on subsegments of each CMP segment. Alameda CTC then input subsegment average speeds and travel

times into a spreadsheet that calculated aggregated average speed for each CMP segment using the segment's travel time and length. Appendix F provides additional technical details.

Assigning LOS

The next step in the analysis process was to assign LOS based on the average speeds calculated for each CMP segment. As adopted in the 2013 CMP, LOS is determined for the entire CMP network based on HCM 1985 with the exception of Tier 2 arterial segments, which will also be reported using HCM 2000 for comparison purposes. This study uses the LOS speed methodology as shown in Tables 2-4, 2-5 and 2-6.

Table 2-4: Freeway LOS (Source: HCM 1985)

Level of Service	Speed (mph)	Density (pc/mi/ln[1])	V/C Ratio	Maximum Service Flow (pcphpl[2])
A	≥ 60	≤ 12	0.35	700
B	≥ 55	≤ 20	0.58	1,000
C	≥ 49	≤ 30	0.75	1,500
D	≥ 41	≤ 42	0.90	1,800
E	≥ 30	≤ 67	1.00	2,000
F	< 30	> 67	- [3]	-

Range for LOS F for Freeway Sections[4]
F30—Average Travel Speed < 30
F20—Average Travel Speed < 20
F10—Average Travel Speed < 10

Source: Adapted from Table 4-1, Special Report 209, HCM 1985

[1] Density measured in passenger cars per mile per lane

[2] Maximum service flow under ideal conditions, expressed as passenger cars per hour per lane

[3] Highly variable, unstable flow; V/C Ratio is not applicable

[4] Approved by Alameda CTC in June 2004 to show degrees of LOS F on congested roadways.

Table 2-5: Arterial LOS (Source: HCM 1985)

Arterial Class	I	II	III
Range of free-flow speed (mph)	45 to 35	35 to 30	35 to 25
Typical free-flow speed (mph)	40	33	27
Level of Service	**Average Travel Speed (mph)**		
A	≥ 35	≥ 30	≥ 25
B	≥ 28	≥ 24	≥ 19
C	≥ 22	≥ 18	≥ 13
D	≥ 17	≥ 14	≥ 9
E	≥ 13	≥ 10	≥ 7
F	< 13	< 10	< 7

Source: Table 12-1, Special Report 209, HCM 1985

Table 2-6: Arterial LOS (Source: HCM 2000)

Urban Street Class	I	II	III	IV
Range of free-flow speed (mph)	55 to 45	45 to 35	35 to 30	35 to 25
Typical free-flow speed (mph)	50	40	35	30
Level of Service	**Average Travel Speed (mph)**			
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-35	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 10	≤ 7

Source: Exhibit 15-2, HCM 2000 (U.S. Customary Units)

Assigning LOS - Freeways

Based on the average speed of the freeway in the morning and afternoon peak-periods and using the HCM as shown in Table 2-4, LOS was determined for each CMP segment in each time period. For example, the I-80 EB segment between Ashby Avenue and University Avenue had an average speed of 62.9 mph during the morning peak-period, which is LOS A based on the adopted methodology.

Assigning LOS - Ramps and Special Segments

Based on the LOS criteria from the HCM:

- LOS A occurs when vehicles are traveling at a free-flow speed for the given roadway conditions.
- LOS F occurs when speeds have dropped below 50 percent of the free-flow speeds.
- Levels of Service B to E are calculated at even intervals between free-flow speeds and LOS F speeds.

To determine LOS for these ramps, the free-flow speed was obtained from special studies conducted in 1992, during off-peak low-volume conditions. There is one ramp segment that is classified as a weaving segment and is therefore not assigned an LOS consistent with previous monitoring cycles. The performance of this segment can be judged on its average speed.

Assigning LOS - Arterials

Both HCM 1985 and 2000 methods first require classification of the arterial according to its free-flow speed and other road characteristics. The road classification based on HCM 1985 could be Class I, II or III and based on HCM 2000 it could be Class I, II, III or IV. The classifications for Tier 1 and Old Tier 2 were previously determined and were obtained from previous LOS monitoring reports. Classifying New Tier 2 segments by matching cutoff values of free-flow speeds was part of preparation work prior to CMP monitoring.

Using the classification of the street and the average travel speed, and based on relevant HCM definitions as shown in Tables 2-4, 2-5 and 2-6, LOS for the arterial segment is determined for both HCM methodologies. For example, Broadway SB (between Grand Avenue and 14th Street) had an average speed of 14.5 mph during the morning peak. It was classified as HCM 1985 Class III (based on the segment's free-flow speed and other road characteristics) and therefore assigned a LOS C. Using HCM 2000, it was classified as Class IV and assigned a LOS C again. In later sections where the number of LOS F segments are tallied and compared to previous years, LOS F segments were identified using the HCM 2000 methodology for Tier 2 Arterials.

Assigning LOS - Rural Roadways

Several Tier 1 and Tier 2 CMP routes (mostly located in the east county) are rural roadways and require a special analysis procedure. Traffic and speed characteristics are fairly uniform on these roadways. Variations in speed are a function of roadway curvature and the presence of slower trucks in the traffic stream. One such Tier 1 roadway is SR-84 between the southern city limit of Livermore and Mission Boulevard in Fremont. Rural roadways identified in the Tier 2 network include a portion of Vasco Road in Livermore and a part of Crow Canyon Road, both connecting to the county line.

To be consistent with the methodology used in the prior monitoring cycle, based on guidelines from HCM 1985 LOS A occurs when vehicles are traveling near the free-flow speed for the given roadway conditions. LOS F occurs when speeds have dropped below 50 percent of the free-flow speeds. Levels of Service B to E are calculated at even intervals between free-flow speeds and LOS F speeds. This is adapted from the HCM 1985 (Table 8-1). Based on this methodology, LOS is calculated for rural roadways (both Tier 1 and Tier 2) for the current monitoring cycle.

2.3.2 | **Transit Data Analysis**

In the process of developing the methodology for transit performance monitoring, three measures were identified: the average bus speeds during peak-periods, average bus speed to average auto speed ratio, and peak-to-off-peak bus speed ratio.

As mentioned in Section 2.2.3, the transit service on selected routes was provided by two different transit agencies: AC Transit and LAVTA. Each of these agencies collects and stores a different set of parameters on their system. Therefore, a set of data analysis procedures were developed to derive comparable metrics or performance measures from both AC Transit and LAVTA data.

Average Transit Speed for Peak-Periods

After cleaning up the AVL data based on geospatial criteria and monitoring periods, the data points (snapshots) were mapped on the corresponding bus routes. Next, speeds were estimated for the CMP segments by inserting new data points at the CMP segment end-points, and then interpolating or extrapolating the date/time stamp at the CMP end-points. For each bus run, it was assumed that buses would operate in a safe manner within the roadway speed limits. To produce the final results, the results for all of the monitored routes were consolidated and aggregated using the weighted average method with the weights set equal to sample sizes.

The data was cleaned up by removing inaccurate data points. There are many factors that could affect the quality of GPS readings. For example, trees, buildings, and clouds could block satellite's line of sight in some portion of the road and result in poor GPS reading. No matter what the cause of the suspect GPS reading, a data point was considered inaccurate whenever one or two of the following criteria had not been met.

- The recorded points must be inside the roadway boundary. A point outside the roadway boundary means GPS triangulation reading has a significant error and must be removed. For example, a data point that falls on top of a building would be considered inaccurate and removed.
- The GPS heading must be along the general direction of movement. Consecutive points must show forward movement. In other words, it is expected that the bus distance from the very first bus stop (for a specific route) increases by time. If a location point indicates that this distance has decreased, it means the bus moved backward which is not possible in normal service conditions and therefore it is an erroneous GPS reading that must be removed.

A similar approach was taken to calculate speeds for LAVTA bus routes using the Running Time database. However, a slightly different approach was needed since the data format for Running Time data was significantly different from AVL data. The Running Time database only contains highly aggregated records for each period. Therefore, only one speed could be calculated without knowledge of speed variations within peak-periods.

Average Bus Speed to Average Auto Speed Ratio

One other measure of transit performance is the ratio of average bus speed to average auto speed, or the transit-to-auto speed ratio. This compares average bus speeds to average auto speeds at the same time, on the same CMP segment. Transit speeds slower than auto speeds are often considered competitive, however a transit-to-auto-travel-time of 1.5,

which translates to a 0.65 transit-to-auto speed ratio is below the threshold of competitive service.[3]

Ratio of Peak-Period to Non-Peak Average Bus Speeds

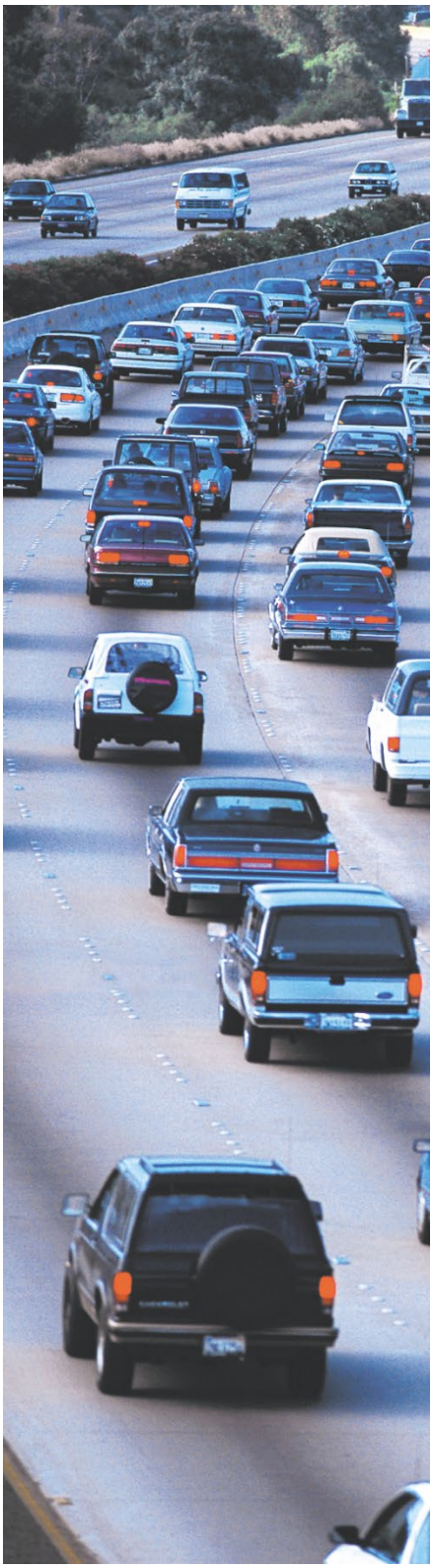
Another measure of transit network performance is the peak-to-off-peak-period speed ratio. This compares service on the same route at different times of day and measures the difference in service during peak-period congestion and uncongested mid-day service. A peak-to-off-peak speed ratio closer to one indicates the peak-period speeds are unimpaired by congestion.

[3] To calculate the transit-to-auto ratio, once the average bus speeds for each segment were determined, the ratio was calculated by comparing average bus speeds to average auto speeds. This ratio is an indication of how quickly buses are moving in the network in comparison with autos. The ratio will be greater than zero, and in most cases below one; a ratio closer to one would indicate that bus speeds are nearing auto speeds in the network at that time.

The Transit Capacity and Quality of Service Manual identified transit-to-auto-travel-time ratio as a primary factor affecting passenger's decision to use transit on a regular basis. The manual acknowledged that transit travel time might be longer than personal vehicle trips, but the time on transit can be used for more productive activities without the hassles of driving during peak-period congestion. If the transit-to-auto speed ratio is 0.65 or above, transit is expected to be considered as viable choice by the users.

3 | LOS Results: Freeways and Arterials

This section presents a summary of LOS results for freeways, highways, ramps and arterials (the Tier 1 and Tier 2 CMP network). The number of congested segments across the CMP network decreased between 2016 and 2018. The 2018 LOS monitoring data show that speeds on roadway segments have mostly stabilized after consistently declining since the recession. In 2018, average peak-period speeds for freeways either remained flat or increased slightly for the first time since 2010. A similar trend was observed on the Tier 1 arterials. Average freeway speeds in the afternoon continue to be lower than during the morning peak-period for both commute and reverse commute directions. Some individual segments saw speeds decrease since 2016, and while congestion remains widespread on the network, average freeway speeds improved slightly. Tier 2 arterial average speeds, however, continued to decline during both peak-periods.



3.1 | Average Speeds

Average speeds on freeways increased slightly (+ 1.1 mph) in the afternoon peak-period, decreased slightly (- 0.3 mph) in the morning peak-period, and decreased slightly on weekends (- 0.4 mph). Average speeds on Tier 1 Arterials increased slightly (+ 0.4 mph) in the morning and afternoon peak-period. Average speeds on Tier 2 Arterials decreased from 25.1 mph to 22.7 mph in the morning and decreased slightly (- 1.7 mph) in the afternoon peak-period. Figure 3-1 compares the countywide average of the freeway and arterial speeds by peak-period between 2016 and 2018.

The recent countywide improvement in freeway speeds and corresponding decline in arterial speeds may be explained by changes in trip-routing. The heavier use of arterial roadways in lieu of relatively short trips on the region's freeways may be the result of either shifting trip origins and destinations or a reaction to widespread freeway congestion. Vehicle routing applications that are built in to many newer automobiles and the wide availability and popularity of trip routing apps may be influencing travel behavior as well. Major capital improvement projects that have been recently completed (like the I-80 Smart Corridor Project and the I-580 Express Lanes Project) may have contributed to the observed increases in freeway speeds.

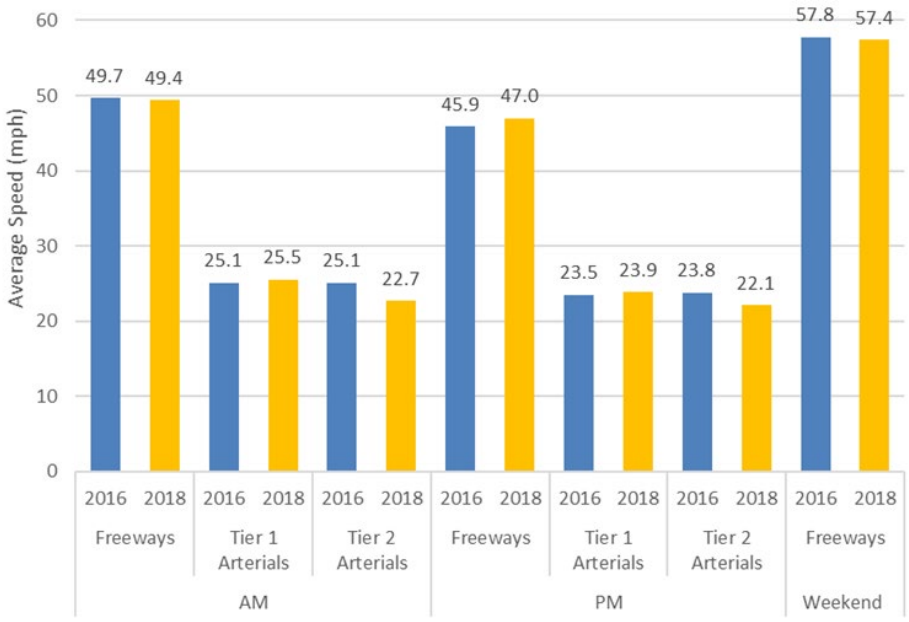


Figure 3-1: Average Speeds (mph) on CMP Roadway (by type and peak-period) – 2016 vs 2018

3.2 | Overview of Congested (LOS F) Segments

Alameda CTC monitors Tier 1 CMP network performance in the afternoon peak-period to ensure CMP conformity or to determine potential development of a deficiency plan. Under the CMP legislation, any CMP segment performing at LOS F during the afternoon peak-period monitoring is potentially subject to CMP deficiency requirements. Segments that perform at LOS F are considered congested. There were fewer congested segments in 2018 than in 2016. In 2018, the number of Tier 1 congested segments decreased from 61 to 47 in the afternoon peak-period. Similarly, the number of congested segments decreased from 37 to 32 in the morning peak-period (see Figure 3-2).

Since the CMP segment lengths vary significantly, congested segments were also analyzed using their lengths in order to better understand the extent of the network experiencing congestion. Of the total 553 miles of the CMP network, 10.8% was congested in the afternoon peak-period (compared to 11.1% in 2016) and 7.3% was congested in the morning peak-period (compared to 7.4% in 2016). 22.2% of the total freeway network was congested in the afternoon peak-period, whereas 16.0% was congested in the morning peak-period. Three percent of the total Tier 1 freeway network was congested on weekends (compared to 3.5% in 2016). The number of congested Tier 1 Arterial segments dropped from 16 to three in the afternoon peak-period, and from six to one in morning peak-period. More detail about congested arterial segments can be found in Section 3.3.1.

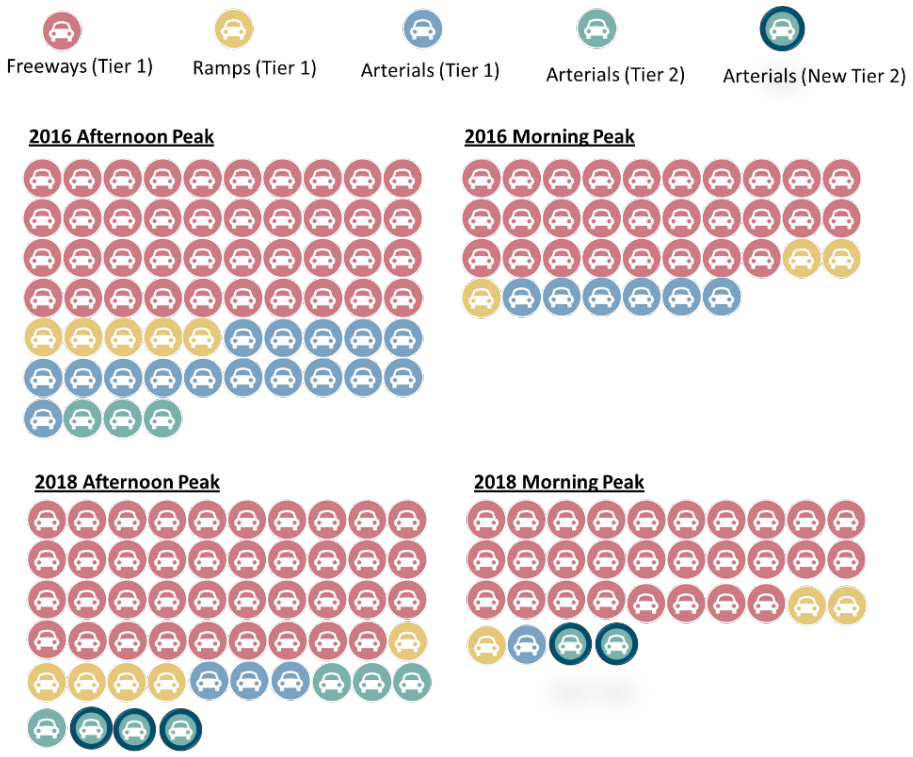


Figure 3-2: Number of Congested Segments LOS F Segments (2016 and 2018)

3.3 | Countywide Network Performance Regarding Congested Segments

This section identifies the congested segments (LOS F) identified in the 2018 monitoring cycle. Comparing the location of congested segments in 2016 and 2018 on the Tier 1 and Tier 2 networks for morning and afternoon peak-periods, Figures 3-3 and 3-4 highlights congested segments in:

- Both monitoring cycles;
- 2016 only, but performance improved in 2018; and
- 2018 only, indicating performance declined in 2018.

New congested segments were observed on the following segments:

- I-680 NB between Scott Creek Road and SR-262 (2.3 miles)
- I-580 EB between Eden Canyon Road and Foothill Road (4.8 miles)
- I-80 WB between Toll Plaza and the San Francisco County (2 miles)
- I-880/SR-260 connection from I-880 SB to SR-260 WB (1 mile)
- SR-185/International Boulevard adjacent to Coliseum BART station (between Seminary Avenue and 73rd Street)(0.8-mile)

In the morning peak-period, there were notable improvements from 2016 congested conditions on Westbound (WB) I-580 merging onto I-80 in Oakland. The traffic backup onto SR-92 WB from I-880 SB in Hayward has also improved noticeably.

New congested segments emerged on I-680 SB between Stoneridge Drive and Sunol Boulevard, on I-880 SB in Fremont between Decoto Road and Stevenson Boulevard, on SR-13 NB between Carson Street and Joaquin Miller Road, and on SR-84 WB between the Dumbarton Bridge toll plaza and Ravenswood Slough. These newly congested segments were generally adjacent to existing congested segments; for example, I-880 SB between Decoto Road and Stevenson Boulevard is adjacent to an existing congested segment I-880 SB between Alvarado Street and Decoto Road.

The following sub-sections discuss the 2018 observations for each category of the CMP network. Each sub-section includes a table containing details about the congested segments. The tables also note the CMP segments impacted by construction and grandfathered segments that were congested (LOS F) in the 1991 or 1992 base monitoring years. The subsections also provide details on network improvements completed between 2016 and 2018 that could potentially explain changes in segment performance.

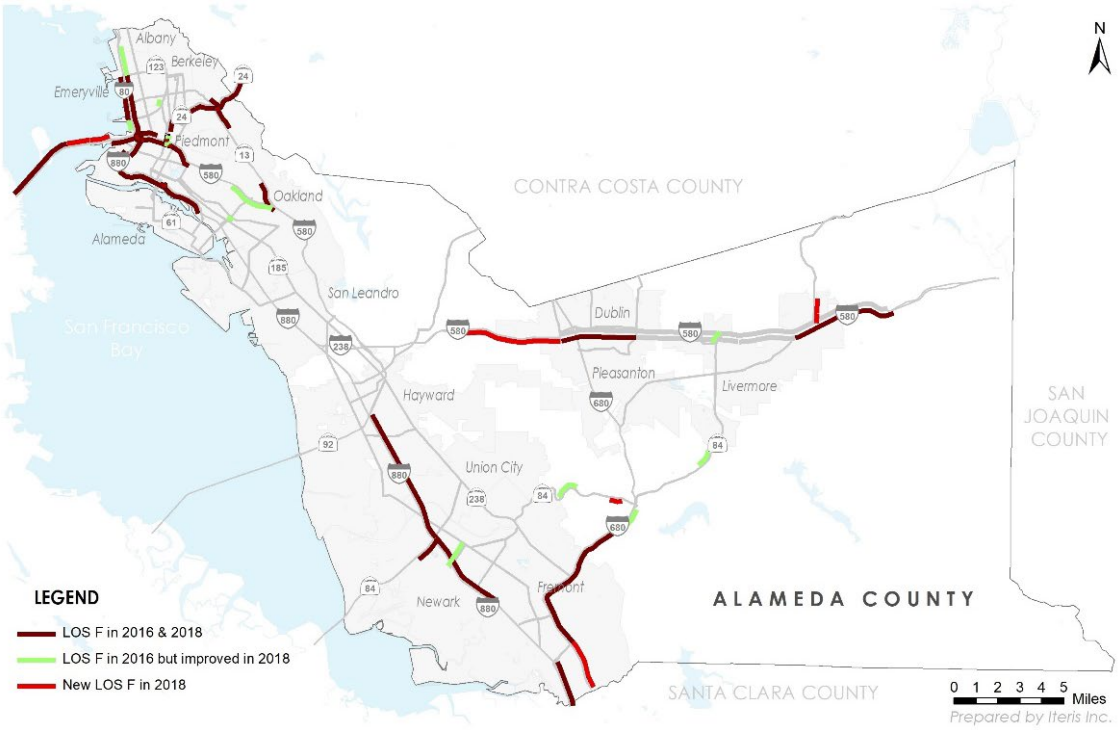


Figure 3-3: Change in Congested Segments (LOS F) from 2016 to 2018 – PM Peak-Period

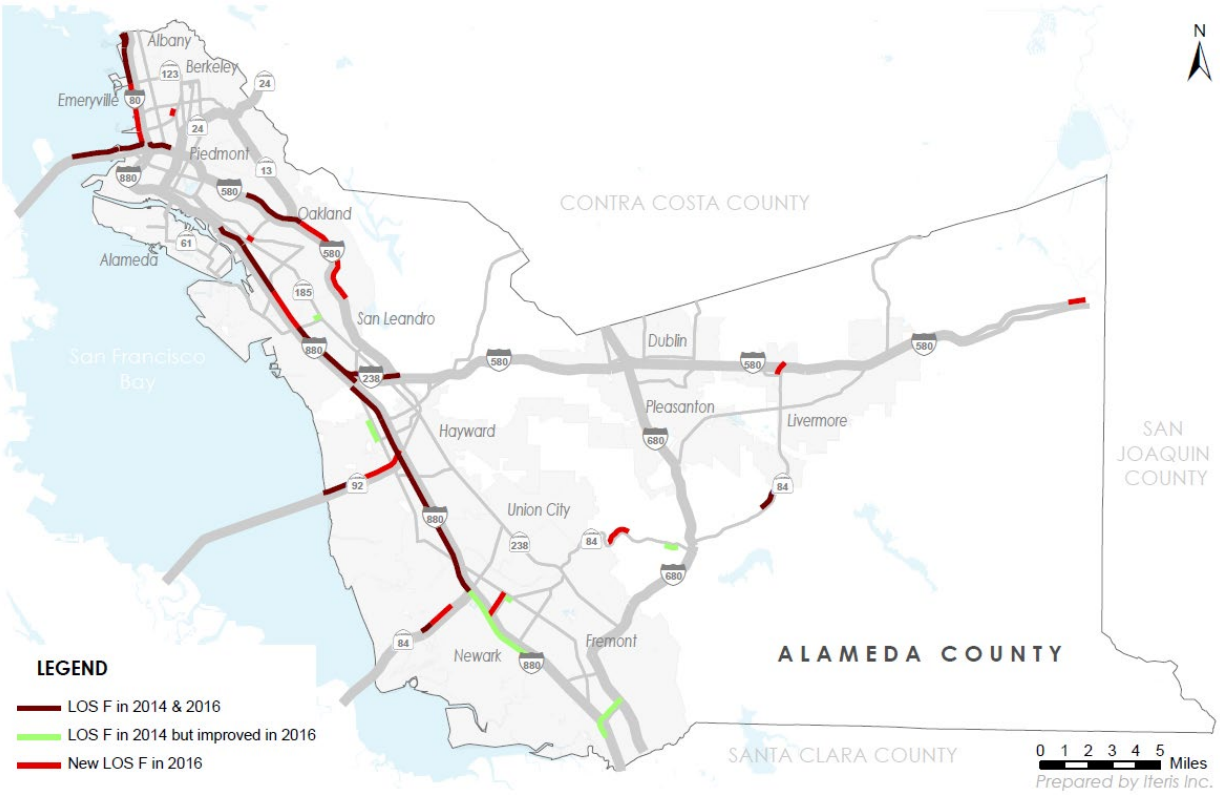


Figure 3-4: Change in Congested Segments (LOS F) from 2016 to 2018 – AM Peak-Period

3.3.1 | Freeways (Tier 1)

As shown in Figure 3-3 and Figure 3-4, the majority of congested (LOS F) segments were on freeways. There were 39 congested segments in the afternoon and 28 in the morning peak-periods (see Tables 3-1 and 3-2). Out of 39 congested segments during the afternoon peak-period, 15 were grandfathered (LOS-F in the base monitoring years), and six segments each on I-680 NB and I-880 NB were impacted by express lane construction.

In the afternoon peak-period, the majority of these segments were located in the northern part of the county, especially leading to or from trans-bay crossings. Many of the remaining congested segments were on corridors carrying traffic from San Mateo and Santa Clara counties into Alameda County, likely traffic returning from job centers on the Peninsula, in Silicon Valley, and in Oakland.

During the morning peak-period, many of the congested segments were located on I-880 and on other bay-crossing bridges/corridors. Notably, North County had fewer congested segments in the morning peak compared to the afternoon peak.

Table 3-1: Congested Segments on Freeways (Tier 1) – PM

Jurisdiction	CMP Route	Segment Limits
Berkeley	I-80 EB	Ashby to University
	I-80 WB	University to Ashby
Emeryville	I-80 EB	I-80/I-580 merge to Powell
	I-80 WB**	Ashby to Powell
Emeryville-Berkeley	I-80 EB	Powell to Ashby
Fremont	I-680 NB*	Scott Creek Rd to Rte 262/Mission
	I-680 NB*	Rte 262/Mission to Durham Rd
	I-680 NB*	Durham Rd to Washington Blvd
	I-680 NB*	Washington Blvd to Rte 238/Mission
	I-680 NB*	SR-238/Mission to Vargas Rd
	I-880 NB***	Dix Landing to SR-262/ Mission
	I-880 NB*	Stevenson to Decoto
	I-880 NB*	Decoto to Alvarado Blvd
Fremont-Union City	I-880 NB*	Alvarado Blvd to Alvarado-Niles Blvd
Hayward	I-880 NB***	Tennyson to SR-92
Livermore	I-580 EB	1st St to Greenville
Newark	SR-84 EB	Newark Blvd/Ardenwood Blvd to I-880 NB off-ramp
Oakland	I-80 EB	Toll Plaza to I-580 SB merge
	I-80 WB	Toll Plaza to SF county line
	I-580 EB**	I-80 to I-980
	I-580 EB	I-980 to Harrison
	I-580 EB	Harrison to Lakeshore
	I-580 WB	SH-24 on-ramp to I-80/580 split
	I-880 NB	I-880/I-80 split to I-880/I-80 merge
	I-880 SB	I-880/I-80 merge to Jct I-980
	I-880 SB	I-980 to 23rd
	SR-13 NB	Moraga Ave to Hiller (Sig)
	SR-13 SB	Redwood to Jct I-580 EB merge
	SR-24 EB**	Jct I-580 (on-ramp) to Broadway/SR-13
	SR-24 EB**	Broadway/SR-13 to Caldecott (enter)
	SR-24 EB**	Caldecott (enter) to Fish Ranch Rd
Pleasanton	I-580 EB	San Ramon/Foothill to I-680
	I-580 EB	I-680 to Hopyard
	I-580 EB	Hopyard to Santa Rita
San Francisco	I-80 WB***	San Francisco county line to Fremont St off-ramp
Unincorporated	I-580 EB	Greenville to N Flynn
	I-680 NB*	Vargas Rd to Andrade Rd
Unincorporated-Pleasanton	I-580 EB	Eden Canyon to San Ramon/Foothill
Union City-Hayward	I-880 NB*	Alvarado-Niles Blvd to Tennyson

* Construction
** Grandfathered
*** This segment is outside of Alameda County and reported for informational purposes

Table 3-2: Congested Segments on Freeways (Tier 1) – AM

Jurisdiction	CMP Route	Segment Limits
Albany	I-80 WB	Central (County Line) to Jct I-580
	I-580 EB	Central (County Line) to Jct I-80
Berkeley – Albany	I-80 WB	Jct I-580 to University
Berkeley	I-80 WB	University to Ashby
Emeryville	I-80 WB**	Ashby to Powell
	I-80 WB**	Powell to I-80/I-580 (Split)
Fremont	I-880 SB	Alvarado to Decoto
	I-880 SB	Decoto to Stevenson
	SR-84 WB	Paseo Padre Pkwy to Toll Gate
	SR-84 WB	Toll Plaza to San M CL
Hayward	I-880 SB	Rte 92 to Tennyson
	SR-92 WB	Clawiter to Toll Plaza
Hayward-Union City	I-880 SB	Tennyson to Alvarado-Niles
Oakland	I-80 WB**	I-580 Split to Toll Plaza
	I-580 WB	Foothill/MacArthur to SH-13 off-ramp
	I-580 WB	SH-13 off-ramp to Fruitvale
	I-880 NB	Hegenberger to High/42nd
	I-880 NB	High/42nd to 23rd (1st on)
	SR-13 NB	Carson/Redwood (1) (off-ramp) to Joaquin Miller
Oakland-San Leandro	I-880 NB	SR-112/Davis to Hegenberger
Pleasanton	I-680 SB	Stoneridge Dr to Bernal
San Leandro	I-880 NB	I-880/I238 split to Marina Blvd
	I-880 NB	Marina Blvd to SR-112/Davis
San Mateo	SR-84 WB***	San M CL to Ravenswood Slough
Unincorporated	I-580 WB	I-205 (SJ Co) to Grant Line
	I-680 SB	Bernal Ave to Sunol Blvd
Unincorporated - San Leandro	I-238 WB	I-580 to I-880
Union City-Fremont	I-880 SB	Alvarado-Niles Blvd to Alvarado

* Construction
** Grandfathered
*** This segment is outside of Alameda County and reported for informational purposes

3.3.2 | Segments Improved Since 2016

CMP segments that were congested (LOS F) in 2016 afternoon and morning peak-periods, but have improved in 2018, are listed below. The I-80 Integrated Corridor Management (ICM) Project in Alameda and Contra Costa Counties implemented dynamic signing and adaptive ramp meter control and began operation in September 2016. The performance improvement on I-80 could be attributed to the I-80 ICM project. Table 3-3 shows other freeway improvements completed between 2016 and 2018 and their corresponding influence on the performance of the impacted CMP network segments.

- I-80 EB: University to Junction I-580 off-ramp (PM)
- I-80 WB: Powell to I-80/I-580 split (PM)
- I-580 EB: Coolidge to SH-13 off-ramp (PM)
- I-680 NB: Andrade Road to Calaveras Road (PM)
- I-80 WB: Toll Plaza to San Francisco County (AM)
- I-580 WB: SH 24 on-ramp to I-80/580 split (AM)
- I-880 SB: I-238 to A Street (AM)
- I-880 SB: A Street to SR-92 (AM)
- SR-84 WB: Ardenwood/Newark to Paseo Padre Parkway (AM)
- SR-92 WB: I-880 to Clawiter Road (AM)

The California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), and Alameda CTC have several construction projects either planned or currently in progress across the county. These projects are anticipated to alleviate traffic congestion and delays, and are expected to result in operational improvements on these corridors that will be captured in the next monitoring cycle.

Table 3-3: Freeway Improvements Completed between 2016 and 2018

Project	CMP Segments Impacted	Changes	
COMPLETED			
I-80 ICM Project: Implementation of adaptive ramp meter control and dynamic signing. It is expected to be operating by September of 2016.	Between the Contra Costa County Line and the Bay Bridge Toll Plaza	The changes due to this construction improvement will be analyzed in the next monitoring cycle.	
SR-92 ramp metering: implementation of ramp metering on the interchanges between the Toll Plaza and I-880.	SR-92 between the Toll Plaza and Clawiter Rd SR-92 between Clawiter Rd and I-880	**Eastbound:** Toll Plaza to Clawiter Rd • AM – LOS A to A • PM – remained at LOS E Clawiter Rd to I-880 • AM – LOS B to B • PM – LOS F30 to E	**Westbound:** I-880 to Clawiter Rd • AM – LOS E to F30 • PM – remained at LOS A Clawiter Rd to Toll Plaza • AM – remained at LOS F30 • PM – remained at LOS B
IN PROGRESS			
23rd/29th			
SR-84			
PLANNED			
SR-262 Connector			
Oakland – Alameda Access Project			
I-680/SR-84 Interchange Improvements and Widening			
I-680 NB Gap Closure Project			
I-880 Express Lane (MTC)			

3.3.3 | Ramps and Special Segments (Tier 1)

Five ramp segments were congested in 2018 in the afternoon peak-period and three in the morning peak-period (see Tables 3-4 and 3-5). Two of these were grandfathered in their base monitoring year. The following freeway to freeway connectors were observed to be congested again in 2018, as they were in 2016.

- I-80/I-580 interchange: from I-580 WB to I-80 NB (PM)
- I-580/SR-24 interchange: from SR-24 WB to I-580 EB (PM)
- SR-13/SR-24 interchange: from SR-13 NB to SR-24 EB (PM)
- I-880/SR-260 connection: from SR-260 EB to I-880 NB (AM and PM)
- I-880/I-238 interchange: from I-238 WB to I-880 NB (AM)
- I-580/I-680 interchange: from I-580 WB to I-680 SB (AM)

Table 3-4: Congested Segments on Ramps & Special Segments (Tier 1) – PM

CMP Route	Segment Limits	Jurisdiction
I-80/I-580 Interchange**	I-580 WB to I-80 NB	Oakland
I-580/SR-24 Interchange	I-580 WB to SR-24 EB	Oakland
I-580/SR-24 Interchange	SR-24 WB to I-580 EB	Oakland
SR-13/SR-24 Interchange**	SR-13 NB to SR-24 EB	Oakland
I-880/SR-260 Connection	SR-260 EB to I-880 NB	Oakland

** Grandfathered

Table 3-5: Congested Segments on Ramps & Special Segments (Tier 1) - AM

CMP Route	Segment Limits	Jurisdiction
I-880/I-238 Interchange	I-238 WB to I-880 NB	San Leandro
I-580/I-680 Interchange	I-580 WB to I-680 SB	Pleasanton
I-880/SR-260 Connection	SR-260 EB to I-880 NB	Oakland

In the afternoon peak-period, one ramp CMP segment was at LOS F in 2016 and improved in 2018, as follows:

- I-580/SR-24 Interchange: from I-580 WB to SR-24 EB (LOS F to D)

In the morning, there has been no improvement to congested segments on Ramps and Special Segments for 2018.

3.3.4 | Arterials (Tier 1)

In the 2018 monitoring cycle, the overall number of congested segments decreased on the Tier 1 arterial network from 2016. In the afternoon peak-period, there were three congested segments, two of which were also identified as congested in 2016. In the morning peak-period, there was one congested segment. Two segments on SR-84 (between Sunol Road and Plea-Sunol Road; between SR-84 (Off)/I-680 and Vallecitos Lane) were observed as LOS F in 2016 and 2018, indicating likely presence of consistent bottlenecks (see Tables 3-6 and 3-7).

Table 3-6: Congested Segments on Arterials (Tier 1) – PM

CMP Route	Segment Limits	Jurisdiction
SR-84 EB	Sunol Rd to Plea-Sunol Rd	Fremont
SR-84 EB	SR-84 off-ramp/I-680 to Vallecitos Ln	Unincorporated
SR-185 SB (International Blvd)	Seminary to 73rd	Oakland

Table 3-7: Congested Segments on Arterials (Tier 1) - AM

CMP Route	Segment Limits	Jurisdiction
SR-84 EB	Sunol Rd to Plea-Sunol Rd	Fremont

These are the major observations from Tables 3-6 (PM) and 3-7 (AM):

- Following the trend identified in the 2016 report, the segments on SR-84 EB (Sunol Road to Plea-Sunol Road, and SR-84 (off-ramp)/I-680 to Vallecitos Lane) remained congested in the afternoon peak-period.
- SR-84 EB in Fremont became congested during the morning peak-period, consistent with a continuing speed decrease trend since 2016.
- SR-185 (International Boulevard) became congested between Seminary and 73rd in the afternoon peak-period, likely the result of construction related to AC Transit's East Bay Bus Rapid Transit project.

CMP segments that were congested (LOS F) in the 2016 afternoon peak, but have improved in 2018 are:

- SR-84 EB: Vallecitos Lane to Vallecitos Nuclear Center (LOS F to E)
- SR-84 EB: SR-238/Mission to Union City Limit (LOS F to E)
- SR-123/San Pablo SB: Marin Avenue to Gilman Street (LOS F to D)
- SR-123/San Pablo SB: Park Avenue to 35th Street (LOS F to D)
- SR-123/San Pablo NB: 53rd Street to Stanford Avenue (LOS F to D)
- SR-123/San Pablo NB: Washington Avenue to Carlson Boulevard (LOS F to D)
- SR-185/International Boulevard NB: = 46th Street to 42nd Avenue (LOS F to E)
- Hesperian NB: La Playa to W. Winton Avenue (LOS F to D)
- Hesperian NB: Grant to Llewelling (LOS F to E)
- Hesperian SB: Springlake to Llewelling (LOS F to E)
- Adeline NB: MLK Jr. South to MLK Jr. North (LOS F to E)
- University WB: San Pablo to 6th (LOS F to E)
- Decoto WB: Union Square to Alv-Niles Road (LOS F to C)

For the morning peak, the following CMP segments have improved since 2016:

- Adeline SB: MLK Jr. North to MLK Jr. South (LOS F to D)
- SR-84/Thornton(Fremont) WB: Fremont Boulevard to I-880 SB (LOS F to C)
- SR-84 WB: Ruby Hill Drive to Culvert (LOS F to E)
- SR-84 WB: Niles Canyon Quarry to E. Fremont City Limit (LOS F to B)
- SR-185/International Boulevard NB: 46th Street to 42nd Avenue (LOS F to D)
- SR-84 (Livermore) SB: I-580 WB (off-ramp) to Airway Boulevard (LOS F to C)

Table 3-8 shows construction completed on Tier 1 Arterials between the 2016 and 2018 monitoring periods, and their corresponding influence on the performance of the CMP network.

Table 3-8: Tier 1 Arterial Improvements Completed between 2016 and 2018

Project	CMP Segments Impacted	Changes	
SR-84 Expy North Segment (north of Concannon Blvd to Jack London Blvd) widened from 4 to 6 lanes and enhanced bike and pedestrian safety and access. Completed and opened to traffic in June 2014.	SR-84 between Concannon Blvd and Stanley Blvd SR-84 between Stanley Blvd and W Jack London Blvd	**Northbound:** Concannon Blvd to Stanley Blvd • AM – LOS B to A • PM – LOS B to A Stanley Blvd to W Jack London Blvd • AM – remained at LOS A • PM – remained at LOS A	**Southbound:** W Jack London Blvd to Stanley Blvd • AM – LOS B to A • PM – LOS C to A Stanley Blvd to Concannon Blvd • AM – LOS A to B • PM – LOS A to B

3.3.5 | Arterials (Tier 2)

Note that in this monitoring cycle, the Tier 2 network was expanded to include an additional 225 miles of roadways. There were seven congested segments reported on the Tier 2 arterial network in the afternoon peak-period (see Tables 3-8 and 3-9); two of these segments were congested in 2016 and two were congested for the first time in 2018. Tier 2 arterial segments are not expected to carry high traffic volumes. The segment on 8th Street, High Street, and 52nd Street were categorized as LOS F under the HCM 2000, while HCM 1985 categorized the segment as non-F(LOS E: 8th, High Street; LOS D: 52nd Street). This difference can arise on higher speed arterials as HCM 2000 has an additional class of arterials which recognizes free-flow speeds between 45-55 mph. Under this HCM 2000 class, average speed conditions are assigned to LOS categories differently to the equivalent in HCM 1985. Referring to Table 3-9, the other two congested segments are on Hesperian Boulevard and Vasco Road, on which speeds have continued to decline in recent years.

Table 3-9: Congested Segments on Arterials (Tier 2) – PM

CMP Route	Segment Limits	Jurisdiction
Hesperian Blvd-Union City Blvd NB	Union City/Alvarado Blvd to Whipple Rd	Union City
Hesperian Blvd-Union City Blvd NB	Whipple Rd to Hesperian/Union City Blvd/overbridge	Union City
Vasco Rd NB	WB I-580 off-ramp to Scenic Ave	Livermore
Vasco Rd NB	Scenic Ave to Dalton Ave/City-County Line	Livermore
8th St WB	Harrison to Broadway	Oakland
High St NB	I-580 to MacArthur Blvd	Oakland
52nd St EB	Telegraph Ave to Shattuck Ave	Oakland

Table 3-10: Congested Segments on Arterials (Tier 2) – AM

CMP Route	Segment Limits	Jurisdiction
8th St WB	Harrison to Broadway	Oakland
High St NB	I-580 to MacArthur Blvd	Oakland

3.3.6 | Weekend Monitoring on Freeways (Tier 1)

Congested segments on both weekdays and weekends were primarily concentrated in the north county (see Table 3-11); this concentration is similar to the 2016 monitoring results and is more reflective of denser land uses than changes in travel behavior. Two segments that were LOS F in 2016 improved in 2018. One segment performed at LOS F for the first time in 2018: I-680 NB from Durham Road to Washington Boulevard. All LOS F segments are connections to the Bay Bridge. Appendix B provides detailed weekend results.

Table 3-11: Congested Segments on Tier 1 Freeways - Weekend

CMP Route	Segment Limits	Jurisdiction(s)
I-80 - EB	I-80/I-580 (Merge) to Powell	Emeryville
I-80 - EB	Powell to Ashby	Emeryville - Berkeley
I-80 - WB	Jct I-580 to University	Berkeley – Albany
I-80 - WB	University to Ashby	Berkeley
I-80 - WB	Ashby to Powell	Emeryville
I-80 - WB	Powell to I-80/I-580 (split)	Emeryville
I-80 - WB	I-580 Split to Toll Plaza	Oakland
I-580 - WB	SR-24 On-ramp to I-80/580 Split	Oakland
I-680 - NB	Durham Rd to Washington Blvd	Fremont

3.4 | Corridor Performance Analysis

Alameda County is located at the geographic center of the region, and employment centers are located a considerable distance apart, either within the county or the region. Driving trips, especially commute trips, nearly always cover several CMP segments and commonly traverse multiple freeways. It is thus useful to aggregate the results for the entire corridor to understand overall changes in corridor performance. This analysis has been undertaken since 1991 for analyzing performance in the afternoon peak-period. Appendix D provides the full results for each corridor.

3.4.1 | Freeways

Speeds have remained relatively stable since monitoring began in 1991 on most of the 14 freeway corridors reviewed in the afternoon peak-period, with each direction considered separately. Exceptions to this include I-80 WB and SR-13 NB where significant speed increases were observed. The

lowest speeds were on SR-24 in the SB direction, although speeds increased (+ 3.9 mph) in 2018. Speed reductions were observed on freeway corridors including SR-13 SB (- 3.0 mph) and I-880 SB (- 0.1 mph). Note that the I-580 Corridor in the Tri Valley area was not included in the corridor analysis for the 2016 monitoring cycle because it was still in the express lane ramp-up period.

In 2018, freeway corridor speeds remained fairly stable and remained within +/- 5 mph of the 2016 LOS monitoring results (see Figure 3-5).

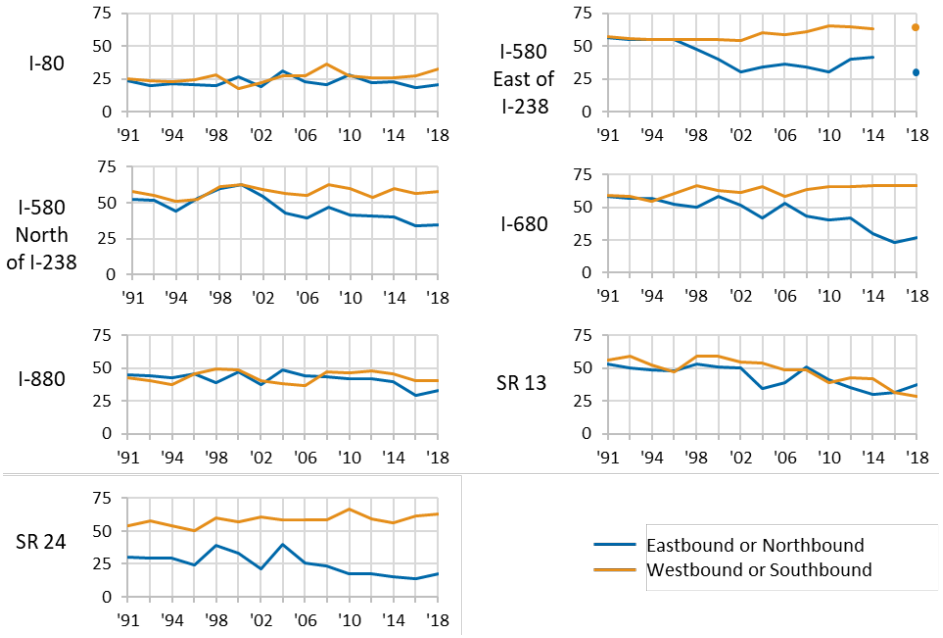


Figure 3-5: Change in Freeway Corridor Average Afternoon Speed from 1991 to 2018 (mph)

Two of the corridors that underwent changes of at least five miles per hour between 2016 and 2018 are examined in detail. Speed increased noticeably on I-80 WB in North County (County Line to Toll Plaza), while Bay Bridge speeds continued to decline. The I-80 SMART Corridor Project implemented a network of integrated electronic signs, ramp meters and other state-of-the-art elements throughout the corridor and on arterial roads. The I-80 SMART Corridor Project was also expected to enhance safety, reduce accidents and congestion along I-80 between the Carquinez Bridge and the Bay Bridge. It is likely that this project contributed to the improved performance observed on this segment.

As mentioned above, there was a significant increase in speed on SR-13 NB from Mountain Boulevard to Hiller Drive between 2016 and 2018, a continuing trend since 2014. The roadway segments serves traffic flow from I-580 to SR-24, where people typically commute from Central

Alameda County to Contra Costa County. One explanation for improved performance is the completion of a project on SR-13 and downstream Ashby Avenue. Since 2012, Caltrans completed several projects in the area, including a project on Ashby Avenue between Hiller Drive and San Pablo Avenue (completed in 2012) and a Pavement Preservation Project on SR-13 between I-580 and SR-24 (completed in 2016). These projects were designed to extend the pavement life and provide smooth driving conditions.

3.4.2 | Arterials

A corridor analysis was conducted on 26 arterial corridors, with each direction considered separately, during the afternoon peak-period since 1991. Of these 26 corridors, shown in Figure 3-6, 17 had average speeds within ± 2.5 mph of the 2018 Results, with the majority showing slight increases in speed. Please note that changes in average LOS were not reviewed as the arterial class of the segments varied along the arterial corridors.

Review of long-term trends on these Tier 1 arterial corridors show that speeds stayed relatively stable during the afternoon peak-period with the exception of Decoto Road/Dumbarton Bridge, SR-84 in Livermore and SR-238. Speeds on Decoto Road/Dumbarton Bridge increased for the first time in 2018, even though speeds on Decoto Road/Dumbarton Bridge have been declining gradually since 2010, reflecting the regional nature of traffic this road carries. This increase may be due in part to the performance improvement along Decoto Road (between Fremont City Limit to Union Square) in both directions in Fremont. Also, SR-84 (Livermore) showed a significant drop in speeds in 2000, followed by a steady increase until 2018. More recent speed increases can be attributed to the widening of a 2.4 mile section of NB and SR-84 SB (Isabel Avenue) from two lanes to four lanes and pavement rehabilitation completed in 2018. Additionally, between 2016 and 2018 performance there was a significant speed increase on SR-238/Mission Boulevard NB from I-680 to Jackson Street in Hayward. The average speed increased by + 4.3 mph.

None of the arterial segments experienced significant speed decreases in the afternoon peak-period, with the exception of SR-185 in both directions, which showed a slight reduction in speed. Many of the remaining segments experienced performance improvement. Martin Luther King Jr. Way /Shattuck Avenue in North Oakland and Berkeley showed overall performance improvement in both directions, indicating a reversal of the trend seen in 2016. The segment of Martin Luther King Jr. Way NB from SR-24 to Adeline Street changed from LOS E in 2016 to LOS D in 2018, a trend found in the opposite direction as well. The segment of Adeline Street that shares roadway with Martin Luther King Jr. Way improved slightly (operated at LOS E) after becoming a congested segment (LOS F) for the first time in 2016.

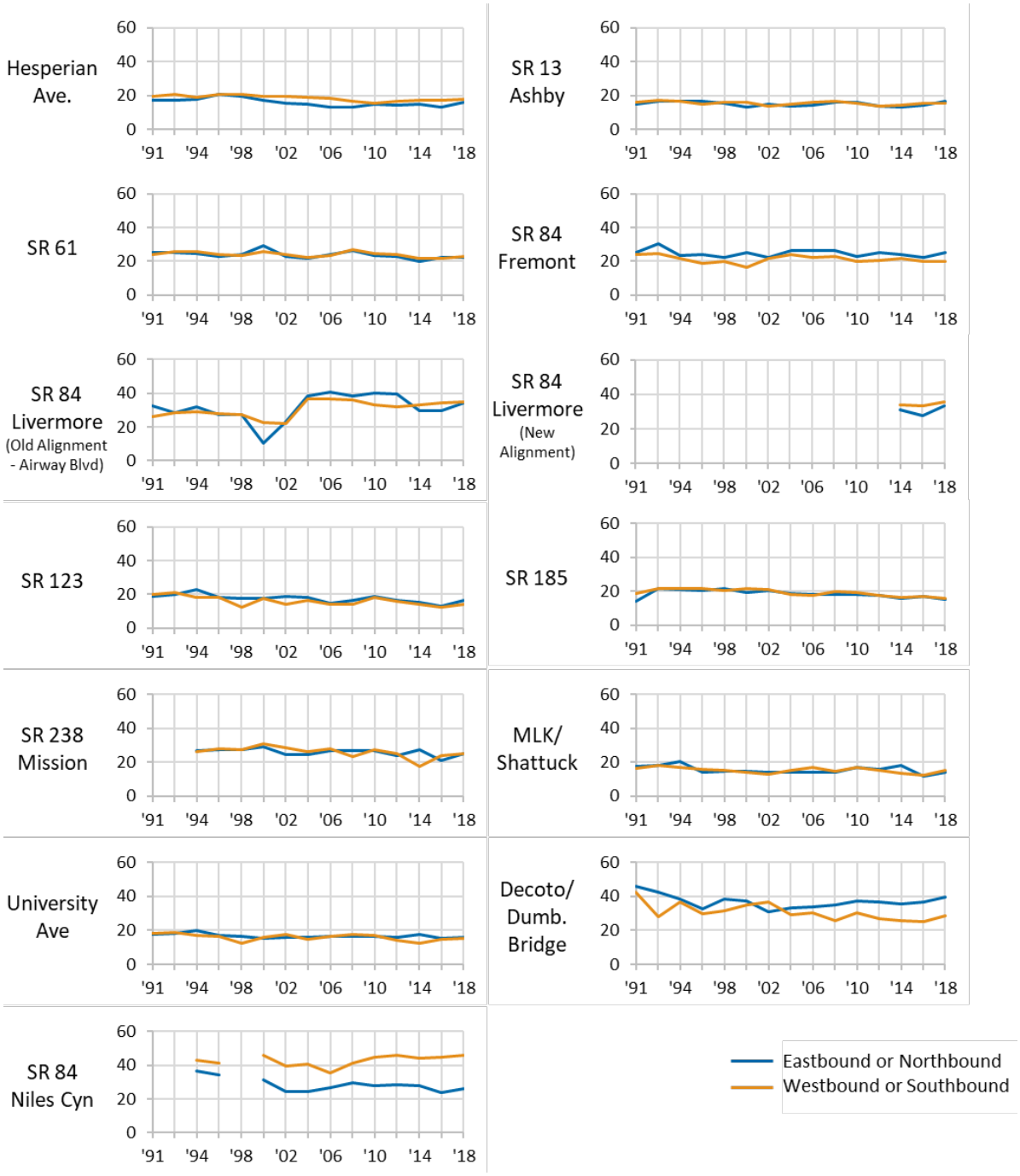


Figure 3-6: Change in Arterial Corridor Average Afternoon Speed from 1991 to 2018 (mph)

4 | LOS Results: HOV and Express Lanes

HOV/express lanes were monitored using floating car surveys because the INRIX TMC-coded network does not separate HOV lanes from general purpose lanes. Alameda CTC began monitoring managed lanes (HOV and express lanes) in 2014, considering them an important tool in efforts to improve the overall performance of a corridor. There were more congested segments during the morning peak-period in 2018 than in 2016. The segments listed in Table 4-2 were found to be congested for the first time since monitoring was first performed in 2014, except the segments on I-80 WB. Performance improved on two segments on I-880 NB (Stevenson Boulevard to Decoto Road; Tennyson Road to SR-92), from LOS F in 2016 to LOS E. Detailed results are presented in Appendix B, Tables B-10 and B-11. Since the last monitoring cycle, two new CMP segments have been introduced to represent this new express lane section:

- I-580 two express lanes EB from Hacienda Drive to Greenville Road; and
- I-580 one express lane WB from Greenville Road to San Ramon Road.

4.1 | Congested Segments

Travel time data for HOV lanes in 2018 revealed that eight segments (16.6%) were congested in the afternoon peak-period (see Table 4-1) and five segments (10.7%) were congested in the morning peak-period (see Table 4-2) for the first time. These occurred mostly on the major regional and interregional corridors along I-80, SR-84 and I-880 where general purpose lanes were also congested (LOS F). No express lanes were congested.

Table 4-1: Congested Segments on HOV Lanes - PM

CMP Route	Segment Limits	Jurisdiction
I-80 EB	Begin of HOV to I-80 HOV/GP Gore	Oakland
I-80 EB	I-80 HOV/GP Gore to Powell St	Emeryville – Berkeley
I-80 EB	Powell to Ashby Ave	Emeryville – Berkeley
I-80 EB	Ashby Ave to University Ave	Emeryville – Berkeley
I-880 NB*	SCL County Line to SR-262/Mission Blvd (450 ft s/o Warren Ave Overhead Bridge)	Fremont
I-880 NB*	Decoto Rd to Alvarado Blvd	Fremont
I-880 NB*	Alvarado Blvd to Alvarado-Niles Rd	Fremont – Union City
I-880 NB*	Alvarado-Niles Rd to Tennyson Rd	Union City – Hayward

* Construction

Table 4-2: Congested Segments on HOV Lanes - AM

CMP Route	Segment Limits	Jurisdiction
I-80 – WB	County Line to I-580/I-80 Merge	Oakland
I-80 – WB	I-580/I-80 Merge to University Ave	Berkeley - Albany
SR-84 – WB	Paseo Padre Pkwy to Toll Gate	Fremont
I-880 – SB*	Tennyson Rd to Alvarado-Niles	Hayward – Union City
I-880 – SB*	Alvarado-Niles Rd to Alvarado	Union City – Hayward

* Construction

No express lane segments were identified as congested or performed at LOS F. For express lane operations, and because of different regulations, Alameda CTC determined that express lanes are considered congested if they are assigned LOS D, E, or F which is equivalent to speeds less than 49 mph.

4.2 | Average Speeds

Appendix A contains the maps showing the HOV and express lanes' performance. Overall, average speeds for the managed lane system in 2018 are presented in Table 4-3 and Figure 4-1, along with a comparison to results from the previous monitoring cycle.

Table 4-3: 2016 - 2018 Average Speed of Managed Lanes (mph)

Monitoring Year	Period	HOV	Express Lane
2018	PM	48.8	75.7
	AM	50.5	65.1
2016*	PM	48.3	68.4
	AM	58.1	65.2
Change 2016 – 2018	PM	- 0.5	+7.3
	AM	-7.6	-0.1

*Note: not include I-580 data, which was in ramp-up period during the data collection cycle

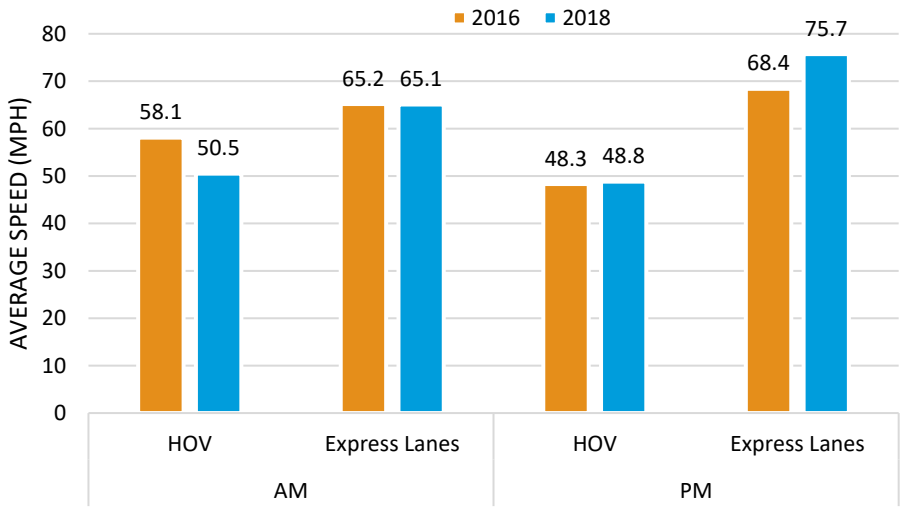


Figure 4-1: Average Speeds on the Managed Lane Network (2016 to 2018)

4.3 | Comparison to Freeway Performance across All Lanes

Through the implementation of managed lanes, Alameda CTC and associated agencies encourage commuters to carpool using HOV lanes, and at the same time maximize roadway capacity and road efficiency. The latter is achieved by enabling single occupancy vehicles to access managed lanes by paying a toll (express lanes). This section compares general purpose freeway lane performance to managed lane performance. Appendix B presents detailed data on managed lane performance.

Most of the managed lane segments were faster than average speeds on the corresponding freeway segments. However, a minority of segments (below the diagonal line on Figures 4-2a and 4-2b) show evidence of congestion on both general purpose lanes and managed lanes during peak-periods. All express lanes performed better than the general purpose lanes. The plots shown in Figures 4-2a and 4-2b provide a comparison of the speed along the freeway (all lanes) and managed lanes for the afternoon and morning peak-periods. Each graph contains a diagonal line which represents parity between the average speeds along freeways and HOV/express lanes. HOV lanes on I-80 (between Powell Street and Toll Plaza) offered the greatest travel time saving, compared to other HOV lanes in Alameda County during both the morning and afternoon peak-periods. The HOV lane on I-880 NB (from W Grand Avenue to I-880/I-80 Merge) had the greatest speed differential during the afternoon peak-period.

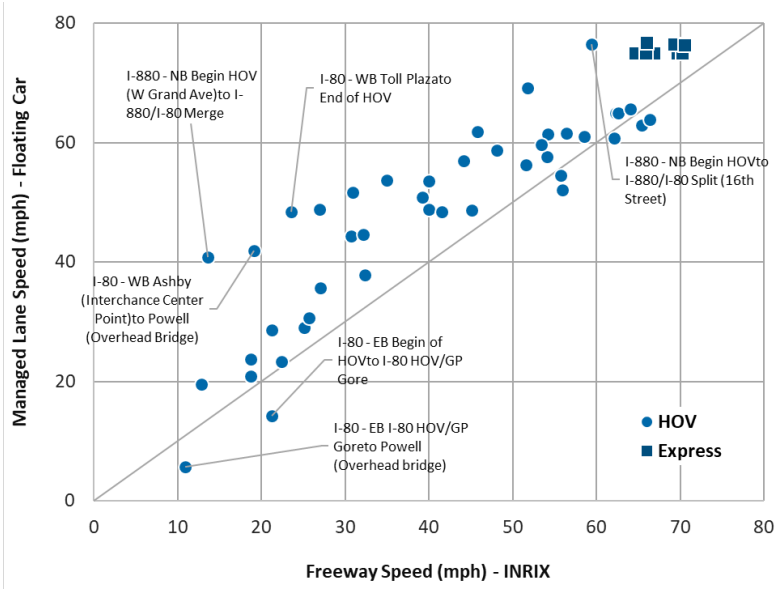


Figure 4-2a: Freeway (Tier 1) to HOV Speed Comparison (2018), PM

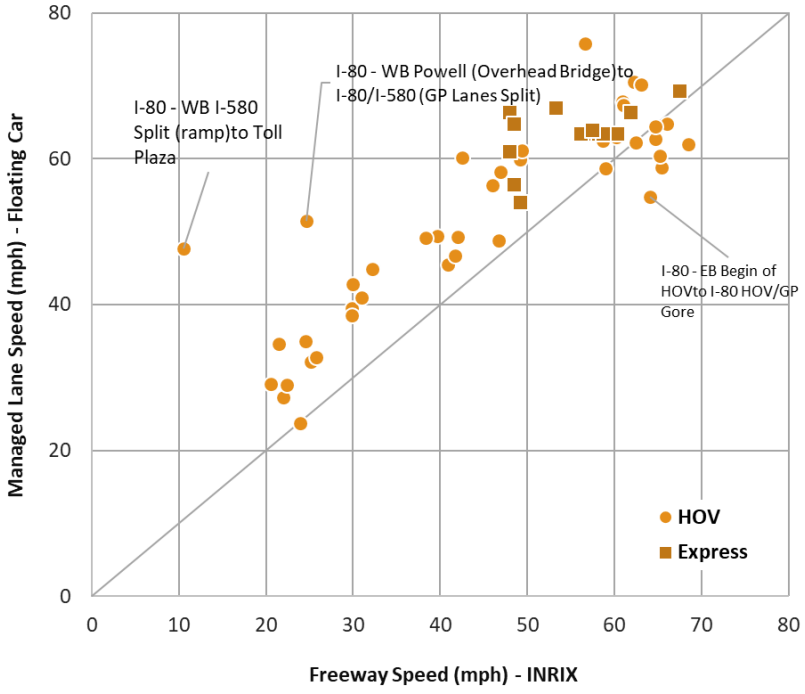


Figure 4-3b: Freeway (Tier 1) to HOV Speed Comparison (2018), AM

4.4 | Findings

The results of the 2018 monitoring cycle indicate that speeds along HOV lanes were generally faster than freeway performance across all lanes by an average of 7.5 mph in the afternoon peak-period and 6.7 mph in the morning peak-period.[4] While HOV performance was generally faster, these managed lanes still experienced congestion at similar locations and time periods as their corresponding general purpose lanes. For example, it was not common to observe free-flowing HOV lanes when the performance of the freeway as a whole was notably slower.

The express lanes offered travel speeds averaging 8.5 mph and a maximum of 18.1 mph faster compared to the overall freeway[5] during the afternoon peak-period. In the morning peak-period, the express lane offered a larger improvement averaging 7.5 mph and a maximum of 18.5 mph faster on one segment (I-580 WB from El Charro Road to Santa Rita Road/Tassajara Road). There is a larger difference in speed between the lanes during the afternoon peak-period. The greatest benefits were seen on the express lanes along I-580 EB that serves traffic coming back home from job centers in San Francisco. Speeds across all lanes on I-680 SB and I-580 WB largely travel at free-flow speeds in the afternoon peak-period. None of the express lanes were congested (less than 49 mph) in the morning peak-period.

4.5 | Limitation of Data Collection Methodology

While these graphs are useful to compare performance across different types of freeway lanes, it is important to understand two limitations of performing the comparison using current data collection technologies and methodologies (i.e. floating car surveys for managed lanes and commercial speed data for all freeway lanes).

First, the floating car surveys have a limited sample size (six floating car runs) compared to the commercial data (thousands of samples). By using an increased sample size, the data obtained are more representative of average conditions throughout the entire monitoring period and are less influenced by outliers.

Second, commercial data includes data for both general purpose and managed lanes due to the current inability of commercial speed data to report speeds lane by lane. However, freeway speeds captured by probe vehicle-based commercial data will be more representative of general purpose lanes as there are more of these lanes than managed lanes, meaning that there are more probe vehicles (and total vehicles) in

[4] These values were weighted by distance consistent with methods used in freeway monitoring from previous cycles.
[5] I-580 WB from Santa Rita Road/Tassajara Road to I-680.

general purpose lanes than in the managed lanes. Hence, it is possible that the speed along the general purpose lanes is slightly slower than reported under the freeway category and that the benefit of using managed lanes is higher than reported.

Even though freeways and HOV/express lanes were monitored using different data collection methodologies, a comparison is still possible, and generally showed the anticipated difference in performance. Continued data collection on these facilities provides Alameda CTC with a quantitative comparison of the performance of managed lanes within congested freeway corridors. For the next cycle, Alameda CTC may consider using lane-by-lane commercial speed data, recently made available.

5 | Transit Monitoring Results

Alameda CTC analyzes bus transit performance to understand the impact congestion has on transit and the agency's ability to meet the multimodal goals of the CMP. This analysis also establishes a basis to compare bus transit travel-times and performance to autos. The 2018 CMP reporting cycle is the first time Alameda CTC performed transit monitoring on major bus transit corridors or truck lines. Future reports will also present year-to-year trends. Transit routes from two agencies (AC Transit and LAVTA) are included in the CMP transit network, providing transit service for 20 routes on 146 miles of the CMP network. These routes (see Table 1-5) provide trunk-line transit service on major arterial roadways throughout the county.

The primary data sources used for this transit performance evaluation are AC Transit AVL data and manually collected LAVTA transit Running Time data.[6] The AC Transit and LAVTA transit routes were mapped to the CMP auto network segmentation to standardize transit reporting with auto reporting on comparable length segments, and to estimate transit-to-auto speed ratios. The performance measures used to summarize the transit monitoring results include:

- **Average Transit Speed:** The average speed of buses on the CMP network. This metric provides a basis for calculating other metrics to provide a better understanding of the transit network.
- **Transit-to-Auto Speed Ratio:** The average speed of buses compared to autos on the same CMP segment at the same time. Larger numbers indicate transit service closer to auto speeds. Low transit speeds with a transit-to-auto ratio close to one suggests congestion on that CMP segment equally impacting both autos and transit.
- **Peak-to-Off-Peak Transit Speed Ratio:** Compares observed transit speeds during the peak-period to those measured during the off-peak-period. Transit speeds during the off-peak-period capture transit speeds during uncongested, or freely flowing, conditions. Depending on the frequency and schedule of the buses during peak and off-peak-period, this ratio could be interpreted somewhat differently. In cases where bus frequency remains the same between the peak and off-peak times, the ratio is expected to be less than 1 (i.e. transit speeds during peak-periods would be somewhat slower than for the off-peak-period). However, if bus frequency is increased during peak service, it is common to see ratios equal or greater than 1, meaning the transit service is operating as it is scheduled. Considering the fact that transit

[6] Data were not available for the Dumbarton Service Lines; therefore the Dumbarton Service Lines could not be included in this monitoring cycle.

agencies in this region adopt the bus frequency (headway) and schedule by period, the latter is more probable.[7]

The transit monitoring network contains 227 CMP segments. However, transit performance could not be evaluated on all of the CMP segments because of inadequate transit data coverage on some of CMP segments (23 segments had insufficient data coverage to provide meaningful results). The low data coverage may be the result of line of sight blockage by trees, buildings, etc. Of the CMP segments with adequate transit data coverage (204 segments), 28 segments did not have data for autos (no INRIX coverage), hence the transit-to-auto ratio could not be calculated for these CMP reporting segments.

5.1 | Average Transit Speeds

Transit speeds for both AC Transit and LAVTA are faster on Tier 1 arterial roads during both peak-periods. Figure 5-1 provides a comparison of the average speeds for AC Transit and LAVTA during the morning and afternoon peak-periods. The average speeds for LAVTA were comparatively higher than AC Transit during both the morning and afternoon peak-periods. This was mainly due to the fact that LAVTA monitoring routes consists only of rapid bus routes (10R and 30R), which have fewer stops and operate on a less congested network in comparison to AC Transit routes, which covered both rapid and non-rapid buses operating in a more congested network.

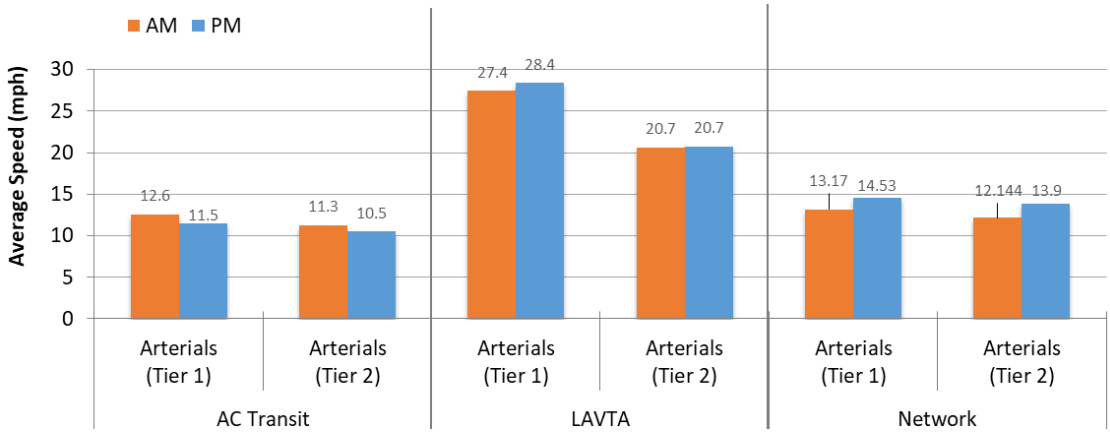


Figure 5-1: Average Speed (mph) across Bay Crossing Bridges (2016)

[7] In addition to the aforementioned metric, Buffer Time Index (BTI) was considered and estimated for each individual route and CMP segment. BTI is the amount of extra buffer time needed to be on-time 95 percent of the time (i.e. late one day per month). The maximum BTI observed during AM and PM peak-periods were 14.9 and 26.7 on the AC Transit CMP segments. BTI could not be estimated using the data provided by LAVTA. Since the transit BTI performance metric is not available across the entire CMP transit network, BTI metrics are not presented and are not discussed further in this section.

AC Transit monitoring routes operate on the urban streets, implying frequent stops and low speeds in mixed traffic, whereas this is not the case for LAVTA monitoring routes (10R and 30R). The afternoon peak-period suffered more severe congestion, as more red-coded CMP segments are shown in Figure 5-3. In the afternoon peak-period, 10.8% of monitoring segments were found to be congested (LOS F) in the auto network and 13.7% in the transit network.

Figures 5-2 and 5-3 illustrate the average speeds for transit during the morning and afternoon peak-periods. Establishing a specific (static) speed threshold across all CMP segments for defining and monitoring satisfactory transit performance could result in misleading performance reporting. Instead, the network's performance should be evaluated considering free-flow operating conditions and other properties and factors of the network. To illustrate this, a similar average transit speed relays a different meaning under different network conditions. A low average transit speed on an uncongested roadway segment might mean improvements to the current conditions are achievable, while we may consider a low average speed on a congested segment normal where improvements are unlikely or very costly. In addition, transit stop density and the spacing of traffic signals affect traffic speeds, as does the presence of on-street parking and other street properties. The one-by-one comparison of transit and auto speeds on the same roadway segment facilitate a better understanding of the transit operating performance.[8]

[8] Transit performance metrics, such as speed, can be categorized to provide the most meaningful and easy-to-understand information. For this purpose, a statistical method to find the optimal or best grouping based on the similarity of the values called Jenks natural breaks classification was used. Using the Jenks method, four average-speed categories or speed groups were created, shown in Figures 5-2 and 5-3. The slowest average speed category was for CMP segments with average transit speeds lower than 8 mph.

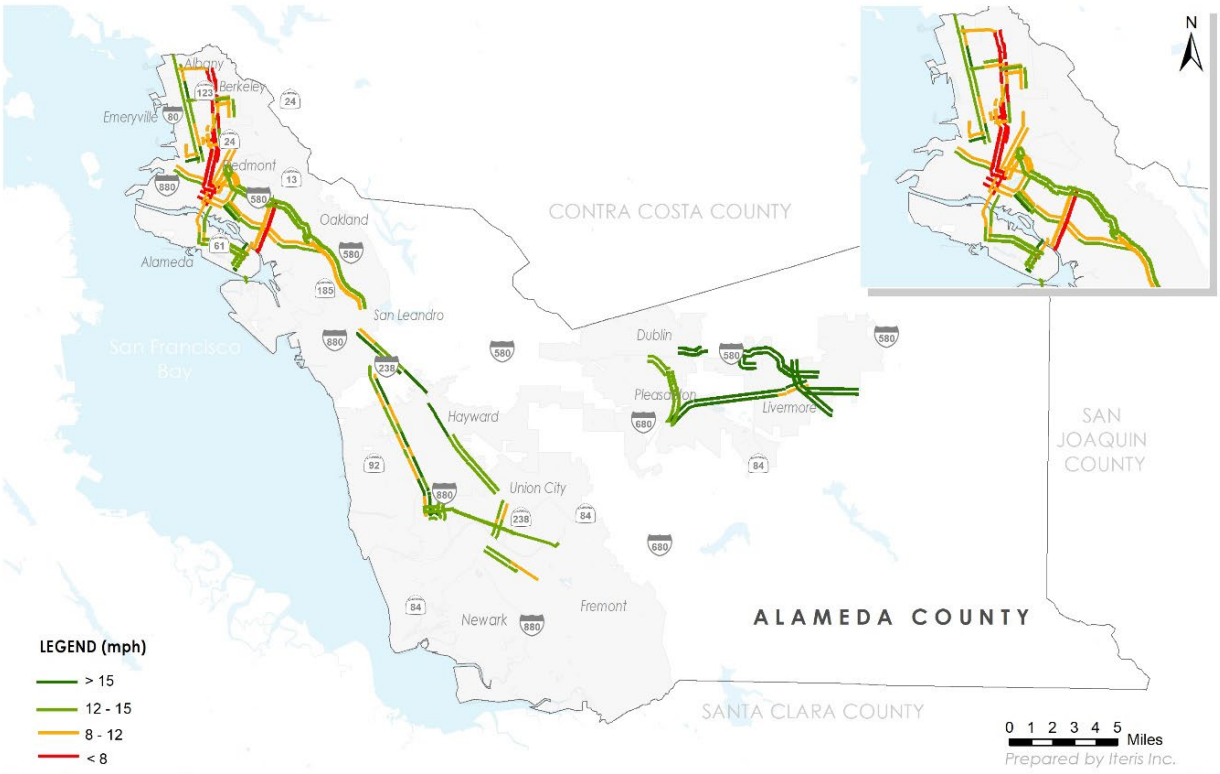


Figure 5-2: Average Transit Speed - AM Peak-Period

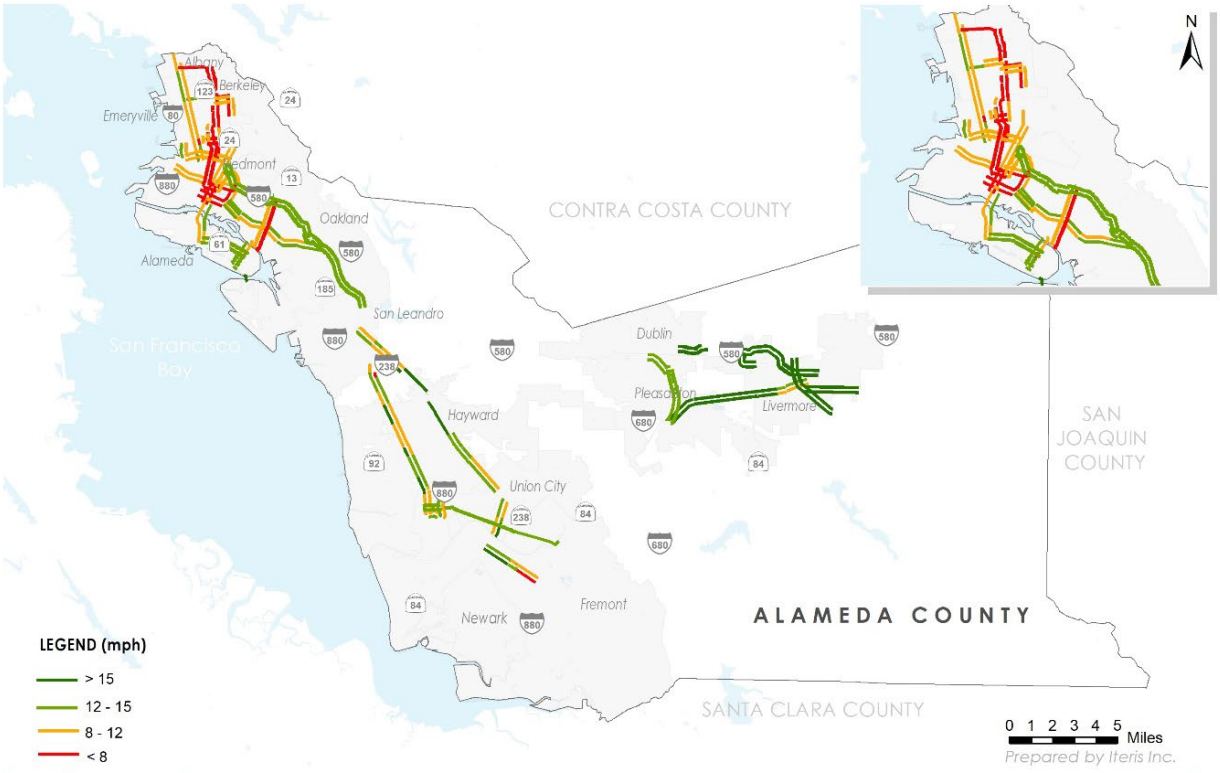


Figure 5-3: Average Transit Speed - PM Peak-Period

As anticipated, the number of CMP segments with average speeds slower than eight mph was greater for the afternoon peak-period than for the morning peak-period. Again, this is consistent with observed auto congestion trends; the afternoon peak-period generally exhibits higher levels of congestion. Tables 5-1 and 5-2 present the CMP segments with slowest average speeds during AM and PM peak-periods, respectively.

Table 5-1: Top 5 Lowest Average Speeds – AM Peak

CMP ID	CMP Route	From	To	Jurisdiction	Method	Sample	Speed
A50	Shattuck Ave	University	Dwight	Berkeley	AVL	220	5.5
A45	MLK Jr Way	SH 24	Adeline St	Oakland	AVL	173	5.8
T36	Shattuck Ave	Alcatraz Ave	Adeline St	Berkeley	AVL	197	6.0
T363	MLK Jr Way	47th St	San Pablo Ave	Oakland	AVL	251	6.2
T279	Shattuck Ave	University Ave	Marin Ave	Oakland	AVL	643	6.3

Table 5-2: Top 5 Lowest Average Speeds – PM Peak

CMP ID	CMP Route	From	To	Jurisdiction	Method	Sample	Speed
A50	Shattuck Ave	University	Dwight	Berkeley	AVL	299	5.3
T36	Shattuck Ave	Alcatraz Ave	Adeline St	Berkeley	AVL	225	5.6
T363	MLK Jr Way	47th St	San Pablo Ave	Oakland	AVL	315	5.8
T279	Shattuck Ave	University Ave	Marin Ave	Oakland	AVL	802	6.0
A49	Shattuck Ave	Dwight	University	Berkeley	AVL	305	6.0

5.2 | Transit-to-Auto Speed Ratio

The transit-to-auto speed ratio compares the performance of the transit travel relative to auto travel on the same road segments and over the same time. The Transit Capacity and Quality Manual defines transit-to-auto travel time ratio of 1.5 (equals to transit-to-auto-speed ratio of 0.65) as a tolerable break point for choice riders, which translates to almost double the driving time (i.e. for a 40-min commute, transit takes up to 20 min longer). Tables 5-3 and 5-4 list those CMP segments with the five lowest transit-to-auto speed ratios for the morning and afternoon peak-periods. The most monitoring segments (54 out of 72 segments) with low

transit-to-auto speed ratio (<0.65) were found on the same facility during morning and afternoon peak-periods. In other words, bus travel time is consistently much lower during both peak-periods on the same roadway segments (54) compared to driving, which indicate the current obstacles for bus riders or the bottlenecks keep the buses from being a competitive means of travel.

Table 5-3: CMP Segments with Lowest Transit-to-Auto Speed Ratio – AM Peak

CMP ID	CMP Route	From	To	Jurisdiction	Method	Sample	Speed Ratio
A45	MLK Jr Way	SH 24	Adeline St	Oakland	AVL	173	0.24
T363	MLK Jr Way	47th St	San Pablo Ave	Oakland	AVL	251	0.29
A230	SR-260 (Tubes)	7th/Web	Atlantic	Oakland	AVL	65	0.34
T38	Shattuck Ave	Alcatraz Ave	51st	Oakland	AVL	53	0.34
A51	Shattuck Ave	Dwight	Shattuck/Adeline	Berkeley	AVL	320	0.37

Table 5-4: CMP Segments with Lowest Transit-to-Auto Speed Ratio – PM Peak

CMP ID	CMP Route	From	To	Jurisdiction	Method	Sample	Speed Ratio
T126	Fremont Blvd	Peralta Blvd	Mowry Av	Fremont	AVL	53	0.29
T363	MLK Jr Way	47th St	San Pablo Ave	Oakland	AVL	315	0.31
T196	20th St	San Pablo Ave	Harrison St	Oakland	AVL	1090	0.32
T6	W. Grand Ave	San Pablo Ave	I-80/ Maritime	Oakland	AVL	108	0.34
T260	MLK Jr Way	San Pablo Ave	47th St	Oakland	AVL	377	0.39

CMP segments with low transit-to-auto speed ratios do not necessarily reflect poor transit service. There are instances in which buses must dwell at fixed stops to load and unload passengers, and there are segments where buses on a specific route must turn left while the auto speeds are derived from fast-moving thru-traffic.

Average transit speeds in dense urban areas are low wherein average auto speeds are also comparatively low. Therefore, as expected, the transit-to-auto-speed ratios in most of the segments within dense urban boundaries are equal to or greater than 0.65.

In the morning peak-period, 73 miles of CMP segments had a transit-to-auto ratio of less than 0.65. In the afternoon peak-period, 82 miles of CMP segments had a transit-to-auto ratio of less than 0.65. Figures 5-4 and 5-5 illustrate the transit-to-auto ratio for all of the CMP segments within the transit monitoring network.

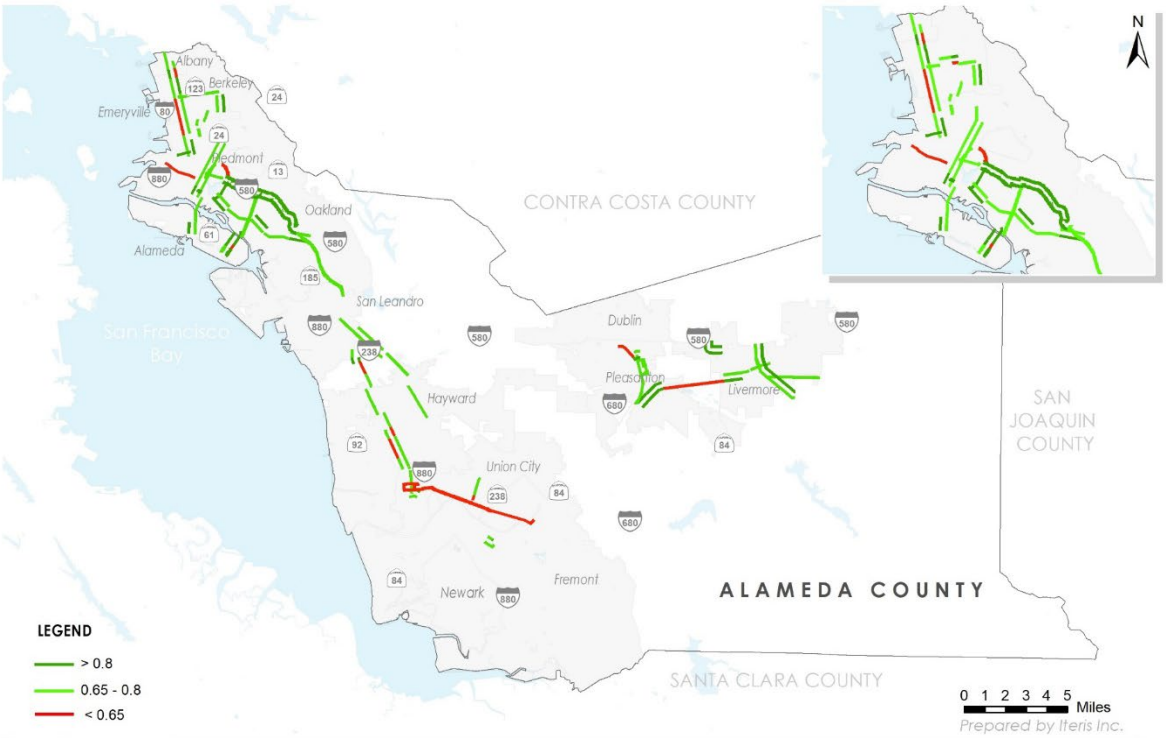


Figure 5-4: Average Bus Speed to Average Auto Speed Ratio - AM Peak

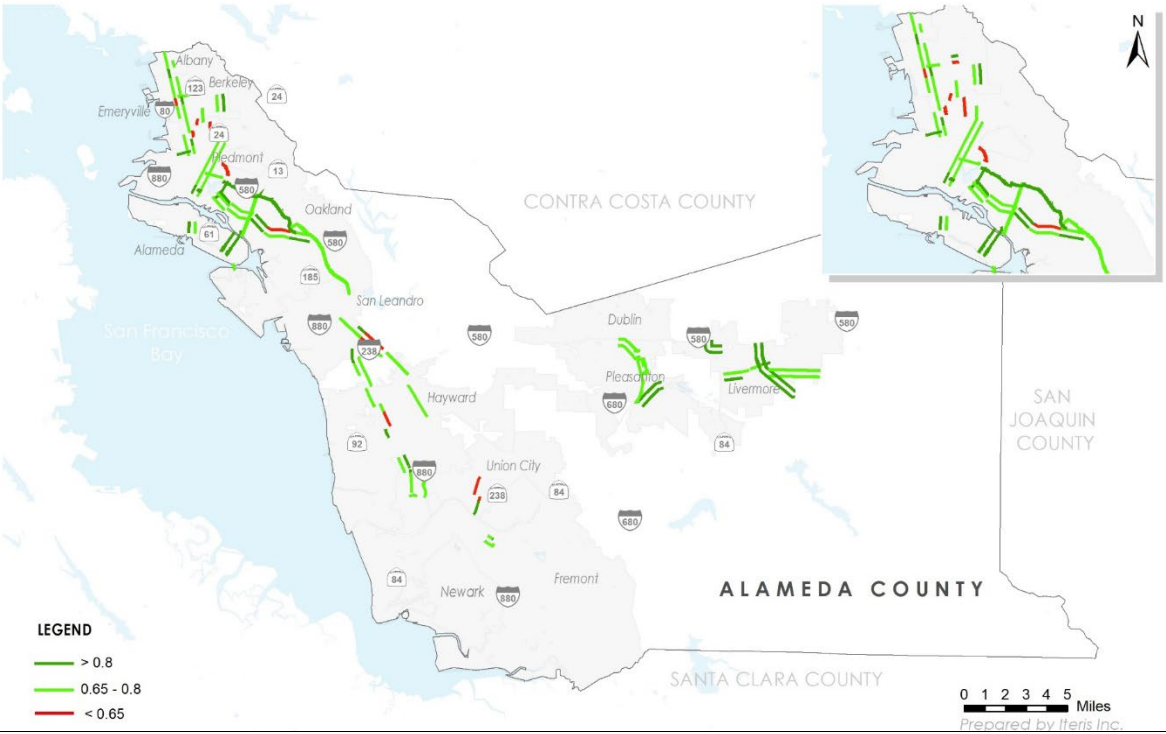


Figure 5-5: Average Bus Speed to Average Auto Speed Ratio - PM Peak

5.3 | Peak-Period-to-Non Peak-Period Transit Speed Ratio

The peak-period to off-peak-period transit speed ratio compares transit speeds during peak-periods to those during non-peak-periods. Figures 5-6 and 5-7 map the peak to non-peak transit speed ratios on the CMP transit network. In general, transit speeds during peak-periods were observed to be similar to off-peak-periods (peak-to-off peak-period ratio greater than 0.8). In the morning peak-period, a 1.3-mile monitoring segment (Fremont Boulevard-NB from Thornton Avenue to Decoto Road) exhibited large differences between peak-period and off-peak-period as shown in Figure 5-7 (red lines). An additional 1.3-mile monitoring segments (Hesperian Boulevard-Union City Boulevard NB from Union City/Alvarado Boulevard to Hesperian/Union City Boulevard/overbridge) showed a similar large speed differences between off-peak and the afternoon peak-period.

However, there were some instances where transit speeds during off-peak-periods were lower than during the peak-periods. Approximately 87.2 miles of 107 CMP segments in the morning peak-period and 47.5 miles of 46 CMP segments in the afternoon peak-periods had higher transit speeds than the off-peak-period. This is likely due to one or more of the following:

- **Higher number of transit stops:**
  - Higher variation of transit stops because of lower service frequency and higher probability of passengers waiting at more transit stops to ride during off-peak-period.
  - Difference between trip patterns - In AM peak, people have a higher time constraint to get to work on time and this translate to direct trip between residential and business districts with less stops per trip. On the other hand, in the off-peak-period people have the flexibility and time stop somewhere on the way home. This means more frequent stops and slower bus runs.
- **Signal timing coordination**
  - Traffic signals are typically running on coordination plans during the morning and afternoon peak-periods, which provide optimum progression for autos and transit vehicles traveling along the main streets. On the contrary, during off-peak-periods, there is typically no signal coordination. Therefore, there is no progression provided for autos and transit vehicles on main streets, resulting in a higher number of stops and delays.

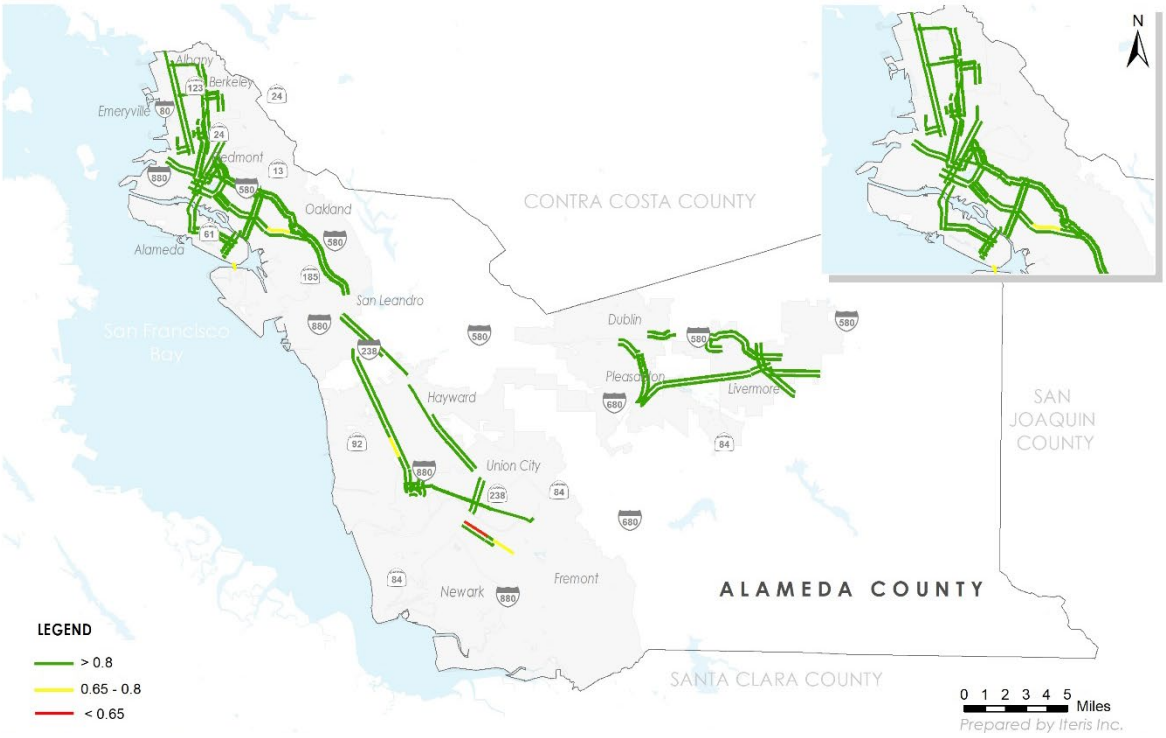


Figure 5-6: Peak-to-Off-Peak Transit Speed Ratio - AM Peak

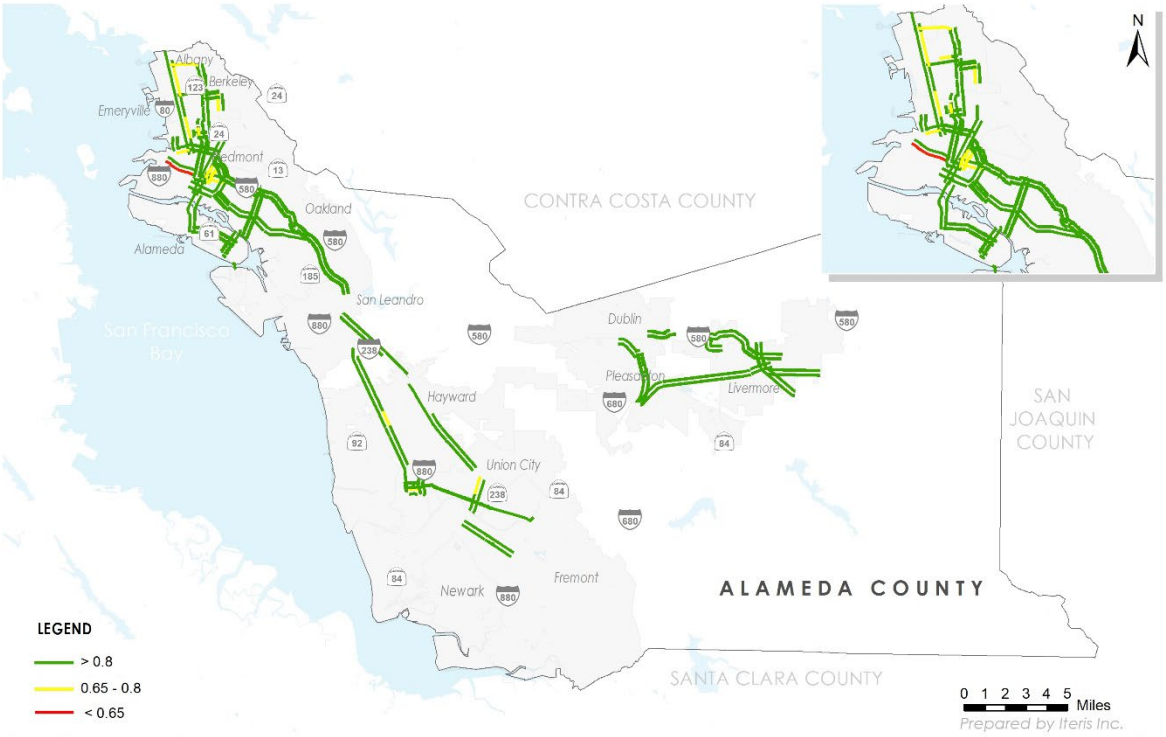


Figure 5-7: Peak-to-Off-Peak Transit Speed Ratio - PM Peak

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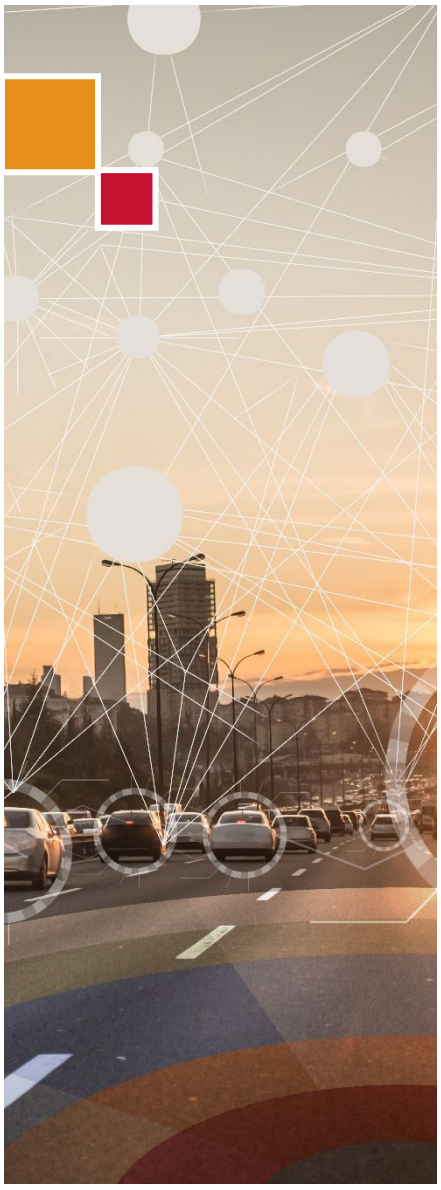
6 | Big Data Performance Metrics



New data technologies and performance measurement approaches have radically transformed congestion monitoring practices nationwide, revolving around the emerging fields of big data and data analytics. These analytical techniques improve the monitoring program by providing more data at a lower cost and widen the scope of congestion analysis.

Using commercial speed data from INRIX, big data performance metrics of reliability and duration of congestion (speeds less than 30 mph) were computed for informational purposes. Data for these additional performance metrics were used from all Tuesdays, Wednesdays and Thursdays in the defined CMP monitoring period. In this report, the travel-time reliability and duration of congestion performance measures will be focused on the Alameda County Tier 1 Freeway network for consistency purposes.

6.1 | Reliability

Travel-time reliability metrics, including buffer time, planning time, and duration of congestion, quantify the day-to-day variation (reliability) in travel time for a corridor. For a driver, this is important to determine how much time to allow for a trip to arrive on time with a high degree of certainty. Unreliable travel times can be caused by normal fluctuations in demand, inclement weather, incidents, work zones and special events. These influencing factors can cause significant variation in travel times.

Calculating reliability for this project includes the following assumptions:

- The monitoring periods for this reliability analysis were 7:00 a.m. to 9:00 a.m. for the morning peak-period and 4:00 p.m. to 6:00 p.m. for the afternoon peak-period.

6.1.1 | The Reliability Concept

A reliability analysis is typically depicted using a probability distribution function. For example, if a driver takes the same trip for 34 days, the graphic shows the travel time results for each of those 34 surveys (see Figure 6-1). Insights may be obtained by reviewing the following:

- High point (tallest point) on the graph, which aligns with the most commonly experienced travel times;
- Leftmost and rightmost parts of the distribution, which align with the minimum and maximum experienced travel times; and
- The range of travel times or the difference between the maximum and minimum occurring travel times.

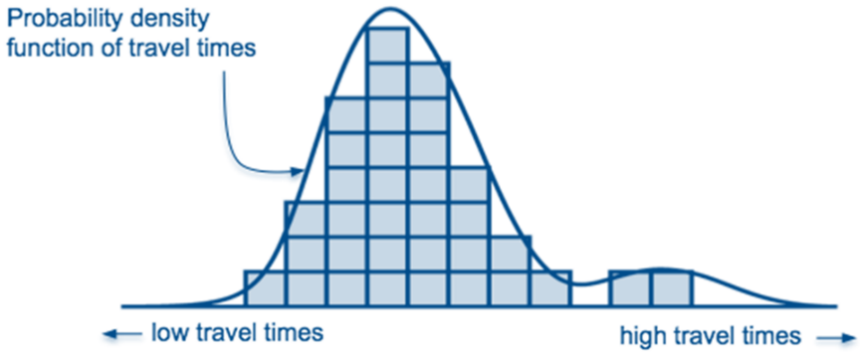


Figure 6-1: Example Probability Distribution Function

In order to compare reliability across various travel time distributions, the following performance measures are defined:

Planning Time: In planning a trip, how much time one should allow for this trip to ensure 95% on-time arrival. It is equivalent to the 95th percentile of travel times experienced (i.e. if the same trip was taken 100 times, the 95th percentile would be equal to the travel time of the 95th longest trip).

- Planning Time = 95th Percentile Travel Time

Planning Time Index (PTI): To allow for comparison across different routes and different trip lengths, the PTI is a ratio of the 95th percentile travel time to the free-flow travel time. If a trip takes 20 minutes in light conditions (i.e. free-flow) and a planning time of 30 minutes will ensure 95% on-time arrival, then the planning time index is 1.5. A free-flow of 65 mph was assumed as is common practice in reliability analysis.

- Planning Time Index = (95th Percentile Travel Time) / (Free-Flow Travel Time)

Buffer Time Index (BTI): The BTI represents the extra buffer or cushion that one allows in addition to the average travel time to account for any delay. For example, if a trip in the morning peak normally takes 25 minutes (i.e. mean travel time), and 30 minutes will ensure a 95% chance of on-time arrival, then the buffer time is 5 minutes and the buffer index is 0.2. A larger buffer index indicates a wider range of travel times and represents less reliable travel.

- Buffer Time = 95th Percentile Travel Time-Mean Travel Time
- Buffer Index = (95th Percentile Travel Time-Mean Travel Time) / (Mean Travel Time)

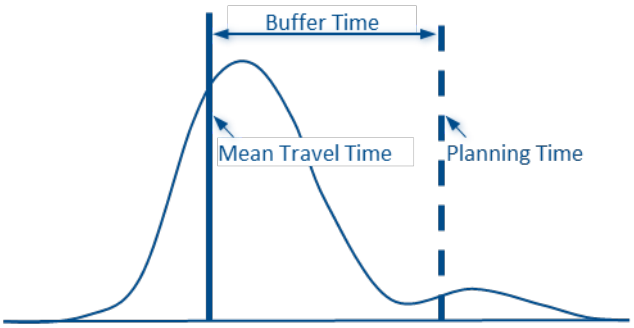


Figure 6-2: Example Probability Distribution Function with Reliability Metrics

6.1.2 | Reliability Case Study for I-880 Corridor

First, the reliability concept is applied on I-880 for 70.6 miles between county boundaries. This section reviews the probability distribution functions for I-880, shows the reliability metrics for this freeway, and provides discussion about the reliability in the NB (see Figure 6.3a) and SB (see Figure 6.3b) directions during both the morning and afternoon peak-periods.

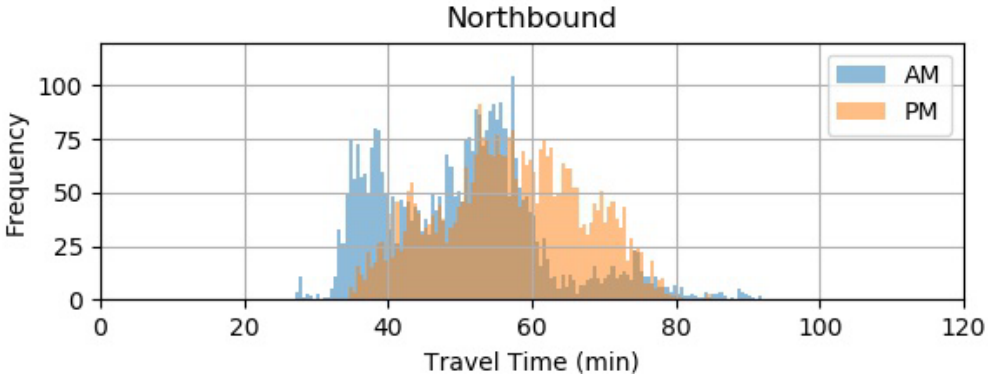


Figure 6-3a: Distribution of Travel Times along I-880 in Alameda County (2018)

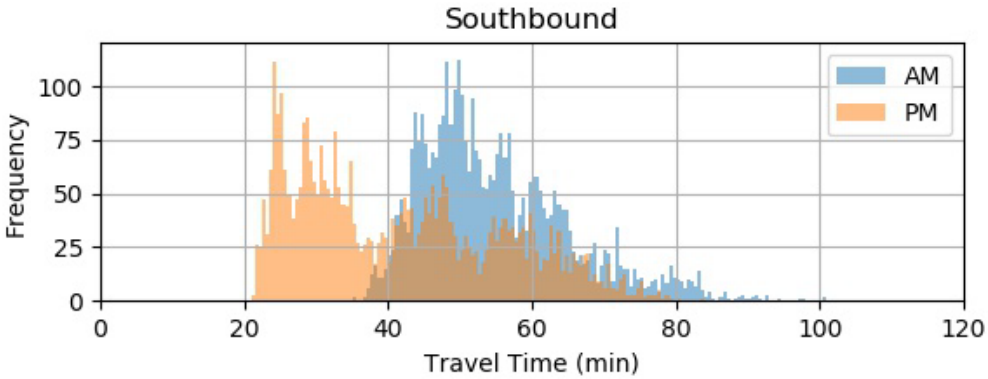


Figure 6-3b: Distribution of Travel Times along I-880 in Alameda County (2018)

The probability distribution function on the full length of I-880 in Alameda County is presented in Figure 6-3a and 6-3b. These show the distribution of morning and afternoon peak-period travel times for the NB and SB directions separately. Note that the graphs in this chapter and the Appendix show two colored distributions, blue and orange, for the morning and afternoon peak-periods, respectively, while the darker shades of both colors represent areas occupied by both peak-period distributions.

In the NB direction, the lower limits for travel time for the morning and afternoon periods were approximately 27 minutes (63 mph) and 35 minutes (35 mph) respectively. The morning travel time distribution had a median of 51 minutes and a maximum of 91 minutes (23 mph). The afternoon travel time distribution had a median of 57 minutes and a maximum of 84 minutes (23 mph). Overall, in the morning, the NB direction experiences moderate congestion with high likelihood of free-flow condition. The afternoon period has heavier congestion with a wider range of travel times and longer tail on the right side (longer travel time).

In the SB direction, the lower limits for travel time for the morning and afternoon periods were approximately 36 minutes (55 mph) and 22 minutes (52 mph), respectively. The morning peak travel time distribution has a median of 55 minutes and a maximum of 75 minutes (20 mph). The afternoon travel time distribution has a median of 41 minutes and a maximum of 66 minutes (25 mph). Overall, the SB direction experiences heavier congestion in the morning peak-period and a mixture of moderate congestion and free-flow in the afternoon period. Both directions have a wide range of travel times. The higher frequency of longer travel time for SB morning trips and NB afternoon trips corresponds to commuter traffic flows to and from employment centers in Silicon Valley, which are reached via I-880.

Figures 6-4a and 6-4b overlay the reliability measures to the previous figures. For the NB direction, the afternoon peak-period has higher frequency of longer trip times but shorter buffer time (meaning better travel time reliability), compared to the SB direction. For the SB direction, the morning peak-period was found to be more congested but with shorter buffer time (meaning better travel time reliability). In comparison with 2016 findings, afternoon trips were shown to be more "reliably congested" in both the NB (2016 Buffer Time – 50.3 minutes) and SB (2016 Buffer Time – 39.6 minutes) directions.

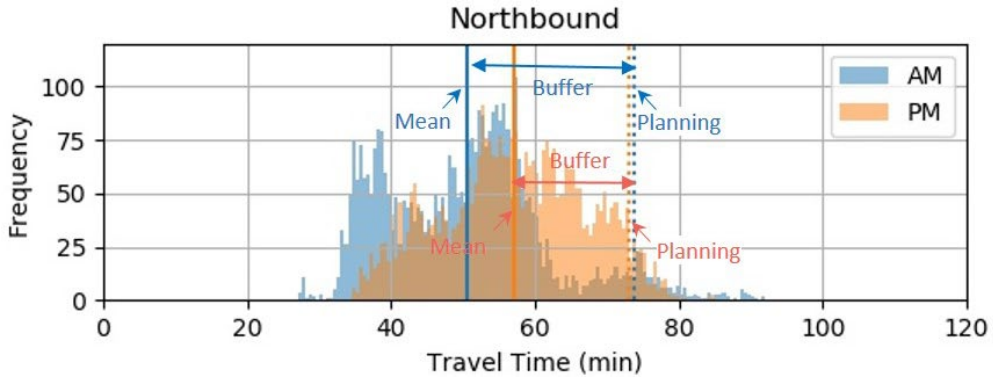


Figure 6-4a: Travel Time Distributions on I-880 Northbound with Reliability Measures (2018)

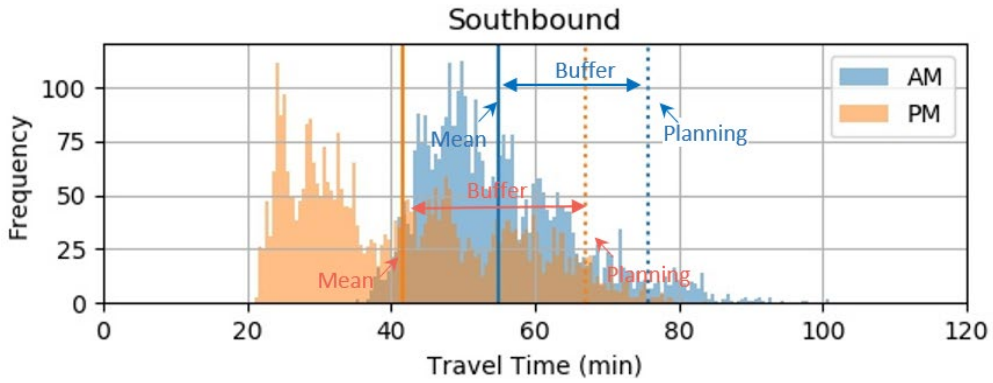


Figure 6-4b: Travel Time Distributions on I-880 Southbound with Reliability Measures (2018)

A summary of all these values is presented in Table 6-1. The table shows that I-880 SB in the afternoon peak-period is the least reliable (BTI = 0.6). A value of 0.6 indicates that drivers would need to add more than half of travel time to their average travel time to ensure 95% on-time arrival. It also shows that NB morning peak trips are generally more reliable with the lowest BTI value of 0.28.

Table 6-1: Summary Reliability Statistics for I-880 (2018)

Dir	Length (mi)	Peak	Free-Flow Travel Time (mins)	Mean Travel Time (mins)	95th Percentile/ Planning Time (mins)	Buffer Time (mins)	PTI	BTI
NB	35.4	AM	32.7	50.56	73.71	23.16	2.25	0.46
		PM	32.7	57.03	73.14	16.11	2.24	0.28
SB	35.2	AM	32.5	54.96	75.70	20.73	2.33	0.37
		PM	32.5	41.71	66.94	25.03	2.06	0.60

6.1.3 | Results

The results for the reliability measures were computed individually for selected freeway segments across the entire CMP freeway network. The study team built these selected freeway segments by combining one or more CMP segments bounded by major freeway system interchanges or

county limits. Considering the I-880 example to illustrate this concept, it was split into three Reliability Segments: between I-80 and SR-92, between SR-92 and SR-84/Decoto Road, and between SR-84/Decoto Road and the Santa Clara County Line. These longer segments provide more meaningful results by combining the congestion within the entire travel corridor. If CMP segments were used, then the analysis would be focused on the location of individual bottlenecks, rather than travel on a longer span of the corridor. The commercial speed data were aggregated for both peak-periods during the monitoring period to compute travel time distributions on these individual Reliability Segments.

The segments and their resulting reliability metrics for the complete CMP freeway network are presented in Appendix G, along with tables, graphs, and maps for the following:

- Travel time and reliability for each individual Reliability Segment.
- Travel time distributions for each Reliability Segment.
- Morning and afternoon peak-period maps showing the reliability for each Reliability Segment

6.1.4 | Most/Least Reliable Segments

Highlighted in this section are the most and least reliable freeway segments in Alameda County using the Buffer Index (BTI) as the primary metric (see Tables 6-2 and 6-3). The most reliable segments tend to be those which are less congested, but as discussed in the previous section, this is not always true because a severely congested segment may also be reliable if it is consistently congested.

Table 6-2: Most Reliable Freeway Segments (2018)

Reliability Segment ID	Peak Period	Description	Segment Length (mile)	PTI	BTI
N19	PM	I-680 NB from I-580 to Contra Costa County Line	1.9	1.0	0.1
N20	PM	I-680 SB from Contra Costa County Line to I-580	1.9	1.0	0.1
N16	AM	I-580 WB from I-80 to Contra Costa County Line	0.9	1.2	0.1
N22	PM	I-680 SB from SR-238 (Mission Blvd) to Santa Clara County Line	6.4	1.0	0.1
N2	AM	I-80 EB from Toll Plaza to Contra Costa County Line	6.1	1.1	0.1
N12	PM	I-580 EB from SR-13 to I-238	7.9	1.2	0.1
N8	AM	I-580 EB from I-680 to I-205	20.0	1.0	0.1
N9	PM	I-580 WB from I-205 to I-680	19.9	1.1	0.1
N16	PM	I-580 WB from I-80 to Contra Costa County Line	0.9	1.3	0.1
N18	AM	I-680 NB from SR-238 (Mission Blvd) to I-580	13.1	1.2	0.1

Table 6-3: Least Reliable Freeway Segments (2018)

Reliability Segment ID	Peak Period	Description	Segment Length (mile)	PTI	BTI
N31	AM	SR-13 NB from I-580 to SR-24	5.8	4.3	1.1
N5	AM	I-238 EB from I-880 to I-580	2.6	2.9	0.9
N13	AM	I-580 WB from I-238 to SR-13	7.9	3.6	0.9
N19	AM	I-680 NB from I-580 to Contra Costa County Line	1.9	2.4	0.9
N26	PM	I-880 SB from I-80 to SR-92	18.8	4.0	0.9
N37	PM	SR-92 EB from Foster City Blvd to I-880	11.7	5.2	0.8
N20	AM	I-680 SB from Contra Costa County Line to I-580	1.9	2.0	0.8
N4	PM	I-80 WB from Toll Plaza to San Francisco County Line	5.3	5.6	0.7
N6	AM	I-238 WB from I-580 to I-880	2.5	5.8	0.7
N14	AM	I-580 WB from SR-13 to I-80	7.7	3.5	0.7

6.2 | Duration of Congestion

The duration of congestion commonly increases when roadways observed longer congested hours in a day. The duration of congestion is a performance measure that adds another dimension to assessing congestion levels. For example, two separate freeways could experience similar speeds due to congestion during the peak-period, however, one of the freeways could be congested for four hours and the other for just one hour. Thus while LOS could be similar at the peak-period, travelers can more easily shift their commute time to avoid congestion on the second freeway. In such cases, the second freeway may be perceived as overall less.

The duration of congestion was calculated as the average length of time per day in which speeds fell below 30 mph between the hours of 4 a.m. and 10 p.m. For example, if the speed falls below 30 mph for 60 minutes on Day 1 and 50 minutes on Day 2, then the average duration of congestion is 55 minutes. The 30 mph threshold for this analysis is equivalent to the threshold for LOS F conditions on freeways based on the 1985 HCM shown in Table 2-4. This analysis is conducted for each freeway CMP segment. The benefits of this analysis are as follows:

- Traditional LOS examines only the heart of the peak-period. While it is common for the slowest CMP segments at the heart of the peak to also experience longer periods of congestion, this is not always true. It is reasonable to conclude that a segment experiencing LOS F for one hour produces less total delay than a segment that experiences LOS F for four hours.
- Quantifying recurrent congestion in time units (hours) is also tangible and understandable to constituents and the public, whereas total vehicle-hours of delay (i.e. values in the thousands) is often difficult to perceive.

Table 6-4 shows the Top 10 longest "duration of congested" CMP segments and their corresponding LOS in both the morning and afternoon peak-periods (from Chapter 3). Many of these segments were on I-80 WB in Emeryville and Berkeley, with congestion on one of these segments lasting 475 minutes (i.e. over 7 hours per day). Two of these segments experienced significant congestion (i.e. LOS F) across both peak-periods. Additionally, four segments experienced LOS F in one peak-period and then LOS D or E conditions in the other peak-period. Four of the Top 10 segments experienced LOS F in one peak-period and then uncongested conditions in the other peak-period indicating that there is a long period of congestion in just one peak-period. One such segment was on I-680 NB from Durham Road to Washington Boulevard in the afternoon with 334 minutes (i.e. more than 5 hours) of congestion daily, most likely attributed to commuters returning from job centers in Silicon Valley. This is an example of congestion spreading beyond the two hour peak-period window allocated for monitoring the LOS, and where the duration of congestion performance measure can more completely describe the roadway performance experienced by commuters.

A complete listing of the duration of congestion for all freeway segments is provided in Appendix G.

Table 6-4: Least Reliable Freeway Segments (2018)

CMP	Description	Length (mile)	Duration of Congestion (Avg. mins per day)[1]	LOS AM/PM
F11	I-80 WB from Ashby to Powell	0.71	475	(F30)/(F20)
F13	I-80 WB from I-580 Split to Toll Plaza	1.31	392	(F20)/E
F105	I-880 SB from I-980 to 23rd	2.74	360	D/(F20)
F61	I-680 NB from Durham Rd to Washington Blvd	1.3	334	A/(F20)
F10	I-80 WB from University to Ashby	1.31	327	(F30)/(F30)
F91	I-880 NB from Alv-Niles to Tennyson	2.6	311	D/(F20)
F60	I-680 NB from Rte 262/Mission to Durham Rd	1.62	306	A/(F10)
F56	I-580 WB from SH 24 On-ramp tol-80/580 split	1.17	293	E/(F30)
F4	I-80 EB from Powell to Ashby	0.72	292	A/(F20)
F31	I-580 WB from I-205 (SJ Co) to Grant Line	0.72	282	(F20)/A

[1] Includes times between 4:00 a.m. and 10 p.m. covering both the morning and afternoon peak-periods.

To gain insight into how peak spreading changed over time, average weekday speeds were calculated for all interstate freeway segments in Alameda County (see Figure 6-5) where INRIX data were available for the 2016 CMP monitoring period (February through May 2016) and for the 2018 CMP monitoring period (February through May 2018).

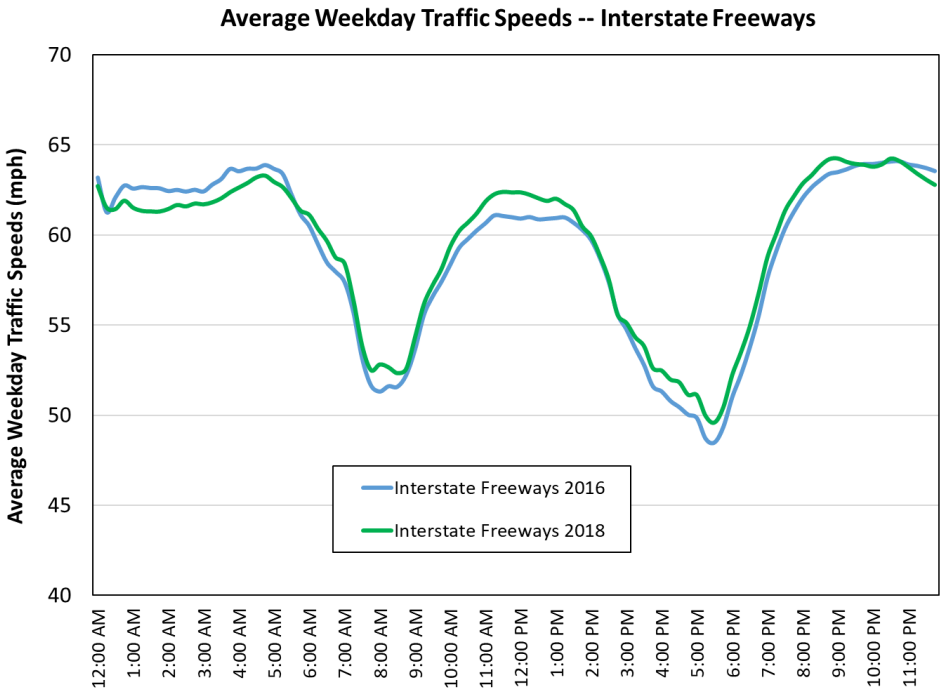


Figure 6-5: Average Weekday Traffic Speeds for Interstate Freeways in Alameda County

Average freeway speeds were higher at nearly every time of day in 2018 than they were in 2016--with less severe peaks. The network as a whole is not experiencing worse peak-spreading in 2018 than it did in 2016.

This same analysis and line graph were created for the major arterial roadways in Alameda County, in order to shed light on how congestion patterns changed for the major arterial streets (Tier 1 Arterials) since 2016 (see Figure 6-6).

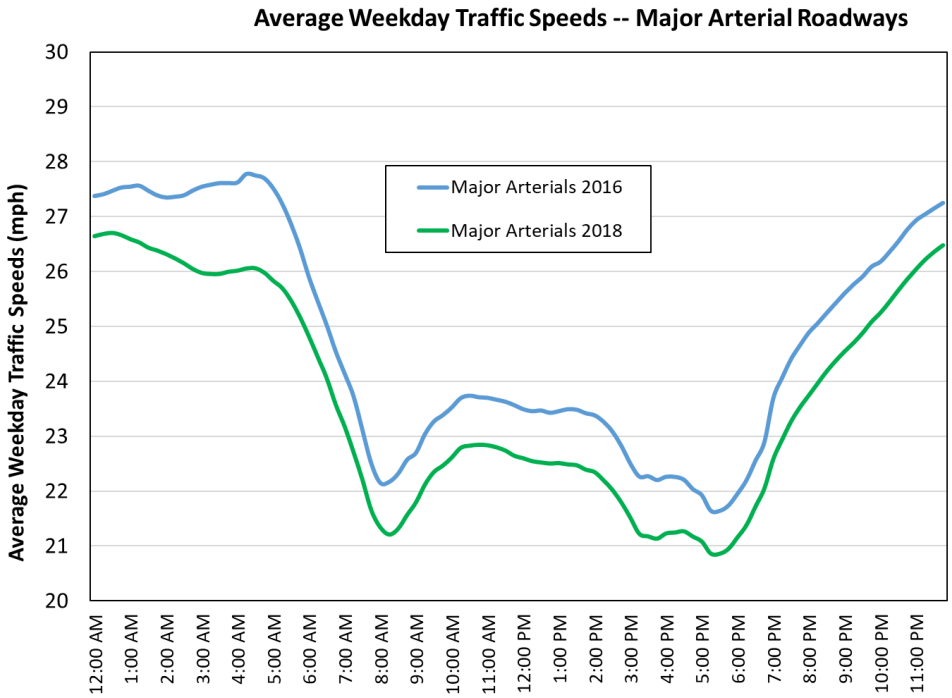


Figure 6-6: Average Weekday Traffic Speeds for Major Arterial Roadways in Alameda County

From Figure 6-6, we can see that 2018 county-wide average speeds on major arterial streets were consistently lower than the 2016 county-wide average speeds. We can also see that the congestion set in earlier in the peak-period, and lasted longer, indicating that the duration of congestion was markedly longer.

The findings from evaluating these countywide average speed graphs are consistent with the findings presented in Chapter 3, that between 2016 and 2018 the peak-period freeway speeds increased slightly and arterials slowed.

7 | Trend Analysis

Alameda CTC has monitored performance of the CMP road network since 1991. Since then, significant land development occurred across the county and the region spurred by rapid growth in the Bay Area's economy, which resulted in a noticeable change in network congestion and overall performance influenced by the growth of the Bay Area's economy. This section analyzes long-term trends starting at the height of the dot-com boom in 2000, continuing through the recession and until today. It relates performance of the transportation network to external factors that influence travel demand and congestion such as the economy, levels of employment, transit ridership, and technological advancement.

Network-wide roadway performance has fluctuated over this long-term time period. First, speeds steadily declined through the dot-com boom before reaching a low in 2006. During the recession, speeds recovered before steadily declining across the entire monitoring network after 2010. In 2018 average speeds trended slightly upward on freeways, and remained stable on arterials. Figure 7-1 shows average CMP network speeds on freeways and arterials between 2000 and 2018. Both freeways and arterials noticeably improved between 2006 and 2010, with freeway speeds increasing from 48.4 to 51.8 mph and arterial speeds increasing from 24.6 to 26.1 mph. Speeds declined on the CMP network after 2010, nearly returning to pre-recession speeds in 2014. Average freeway speeds have remained unchanged in the morning peak-period since 2016, but have increased during the afternoon peak-period from 46.2 mph to 47.5 mph.

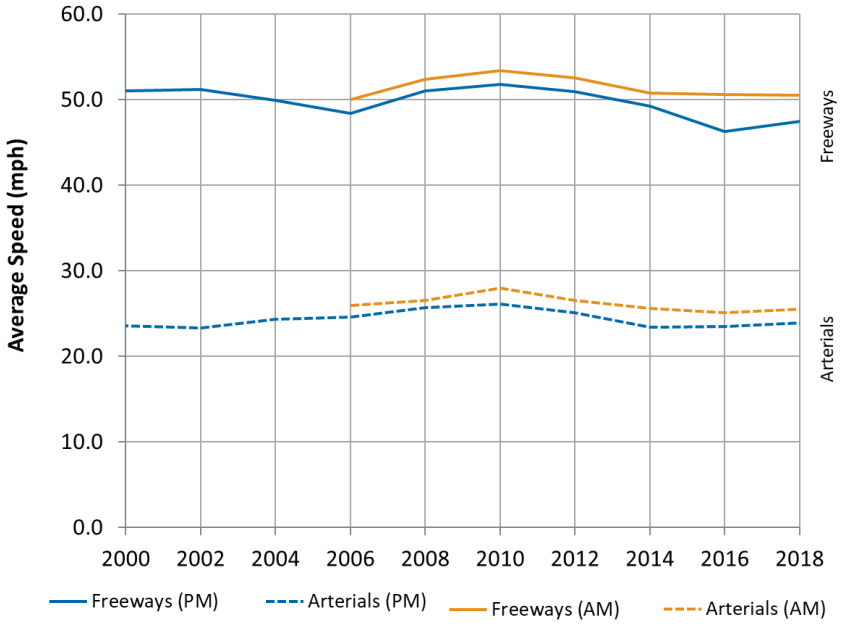


Figure 7-1: Average Speed on CMP Tier 1 Network (mph)

7.1 | Economic and Demographic Trends

Employment levels have fluctuated significantly in Alameda County over the last decade due to the Great Recession. In 2009, employment dropped significantly from 690,000 to 643,000, and reached its lowest level of the past decade in 2010. In 2011, the economy began to recover and by 2014 employment exceeded the county's high employment rate during the dot-com boom as illustrated in Figures 7-2 and 7-3.

Figure 7-2: Alameda County Population and Employment[9]

[9] Source: 2000 - 2004 Annual NAICS Employment Data: US Census; 2000 - 2004 Intercensal Population Data: US Census; 2005 - 2009 Population and Employment Data: 2010 US Census; 2010 - 2017 Population Data: DOF E-2 Report, July 1 Estimate; 2010 - 2017 Employment Data: Quarterly Census of Employment and Wages, June Estimate

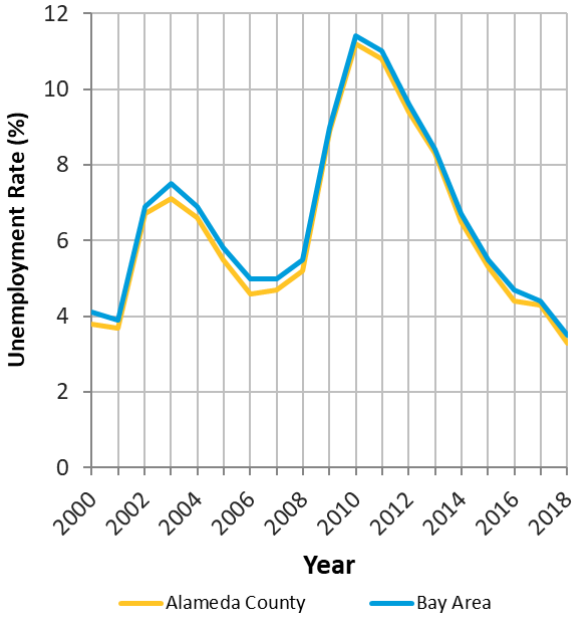


Figure 7-3: Unemployment Rate 2000-2018 (January, not seasonally adjusted)[10]

Since Alameda County is located in the geographic center of the Bay Area, regional and inter-regional commutes impact many freeways that are important regional connectors; particularly on I-80, I-880, and the three bay crossing bridges connecting Alameda County with regional employment centers in Silicon Valley (Santa Clara County), San Francisco, and the Peninsula (San Mateo County).

Alameda County, as well as all surrounding counties, added both jobs and population between 2010 and 2017 (see Figure 7-4). However, counties to the north and east added new residents much faster than jobs, and counties to the west and south added jobs faster than new residents. These growth disparities around Alameda County have resulted in a strong peak-commute demand on the county's transportation system. Peak-direction vehicle volumes at county gateways (including bay-crossing bridges) have steadily increased over the last decade, except dropped 2,023 on I-880 SB at Santa Clara County Line (see Figure 7-5).

[10] Local Area Unemployment Statistics. Bureau of Labor Statistics. https://beta.bls.gov/dataViewer/view;jsessionid=7E0F107F92D465BF55EAD752FD444672; https://beta.bls.gov/dataQuery/find?st=0&r=20&s=popularity%3AD&fq=survey:[la]&more=0&q=alameda+county%20unemployment%20rate

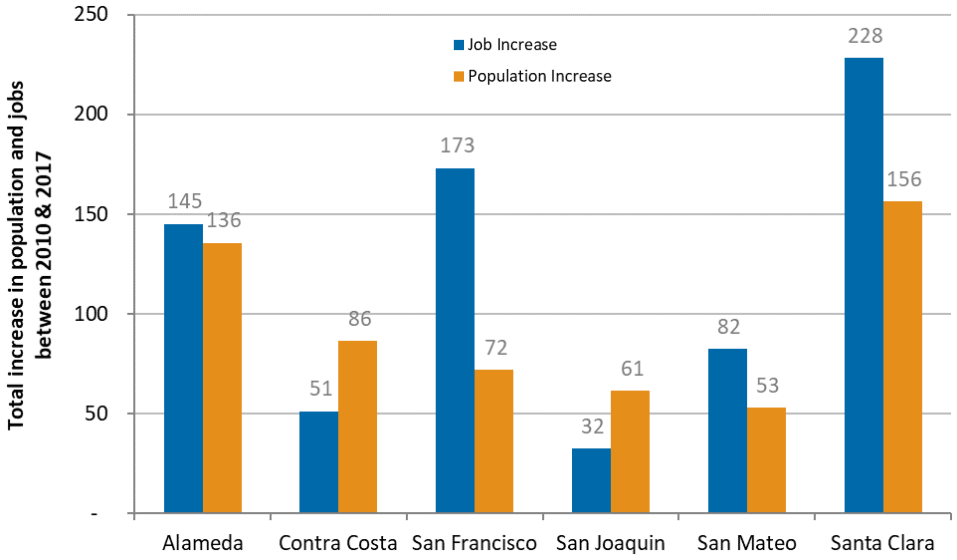


Figure 7-4: Population and Employment Growth in Alameda and Surrounding Counties[11]

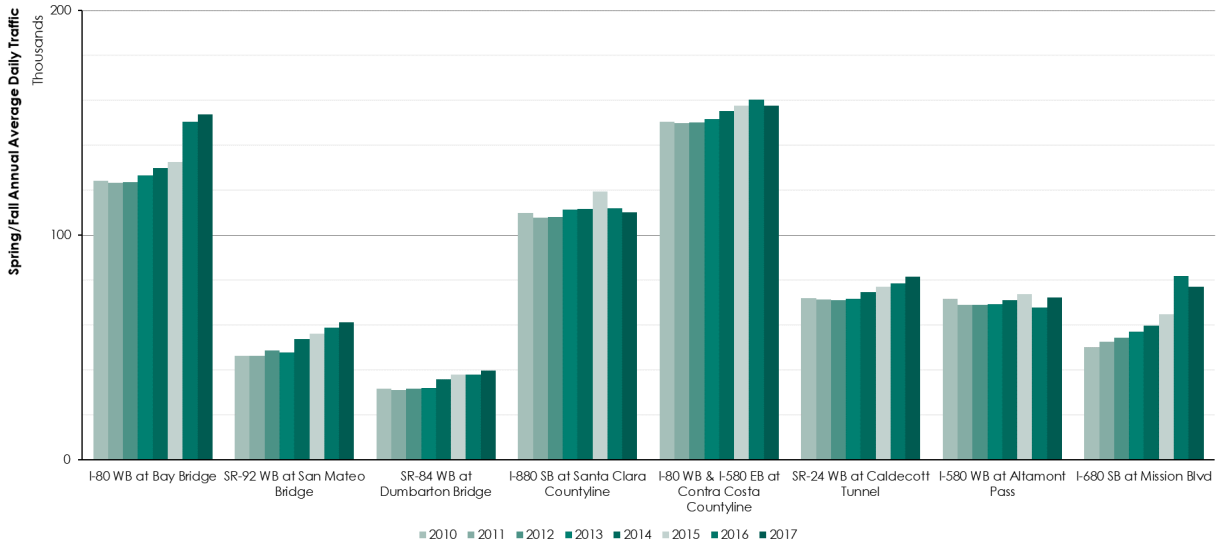


Figure 7-5: Unemployment Rate 2000-2018 (January, not seasonally adjusted) [12]

After reaching historic lows in 2016, gas prices have continued to rise through 2018. At the start of 2016, the price of gas in California was around $2.8 per gallon, and by June 2018 the price had increased to $3.7. Overall, the price of gas has been consistently rising, as seen in Figure 7-6.

[11] DOF E-5 Report 2016-17 estimate

[12] Volumes are Tuesday-Thursday AADT from March-May and September-October. PeMS volumes extracted from MTC processing of raw PeMS Data.

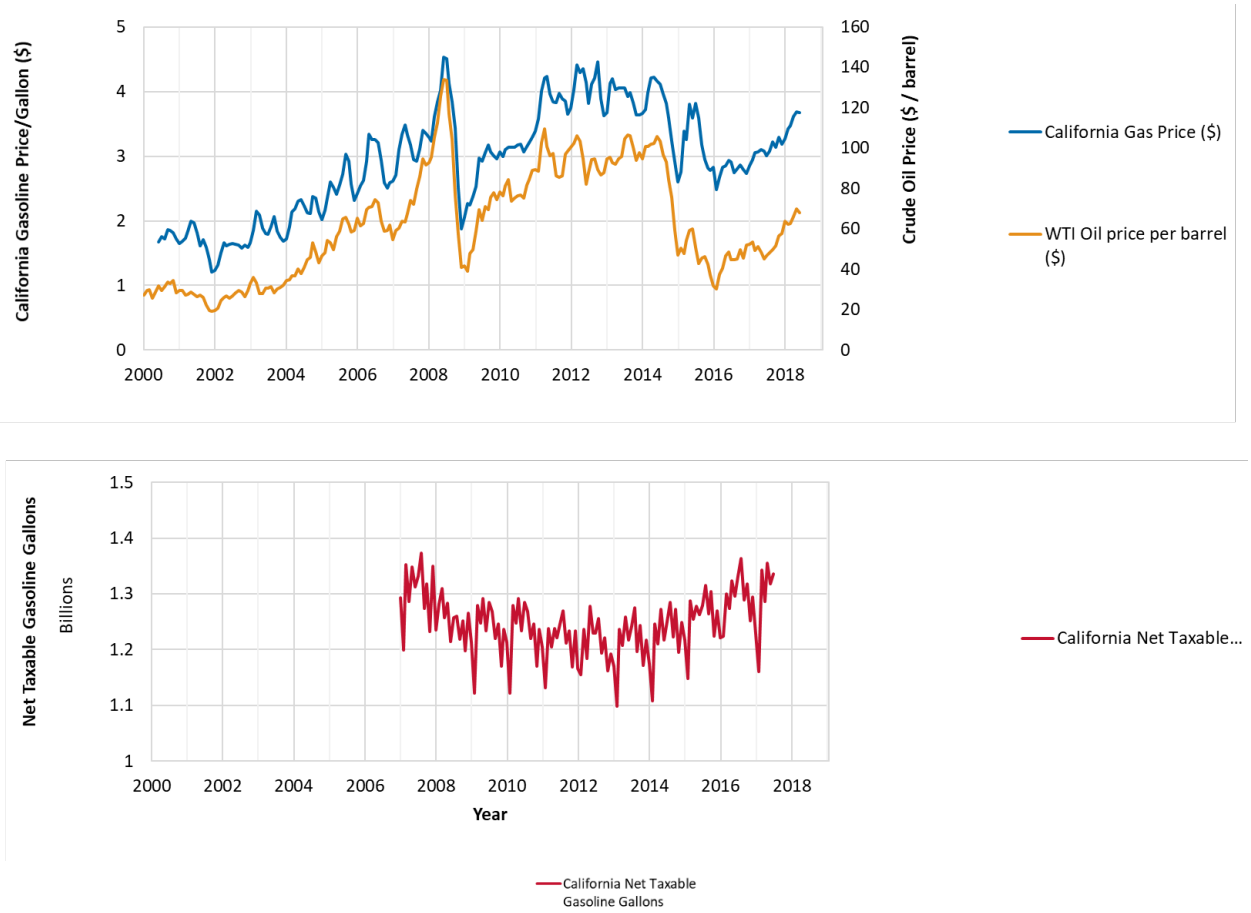


Figure 7-6: Gasoline/Crude Oil Prices (Source: EIA) and Gasoline Consumption [13]

WTI Oil Price per Barrel: West Texas Intermediate (WTI or NYMEX) crude oil prices per barrel

7.2 | Transit Trends

Since the peak of the Great Recession in 2010, BART ridership climbed and freeway speeds dipped until 2016. Since 2016, this trend has reversed even as the local economy continues to grow. Afternoon peak-period freeway speeds increased three percent and BART ridership dropped three percent (most recent data is available for 2017). BART's ridership decline could be attributed to the growing concern among customers about their personal safety, service interruption (unplanned and planned), overcrowding during the rush hour, etc. Commuters could be better off driving instead of taking BART when freeway speeds increased over the 2016-2018 time period. Figure 7-7 shows the relationship between average afternoon peak freeway speeds and BART ridership over the last 16 years.

[13] California State Board of Equalization, Data not available prior to 2007

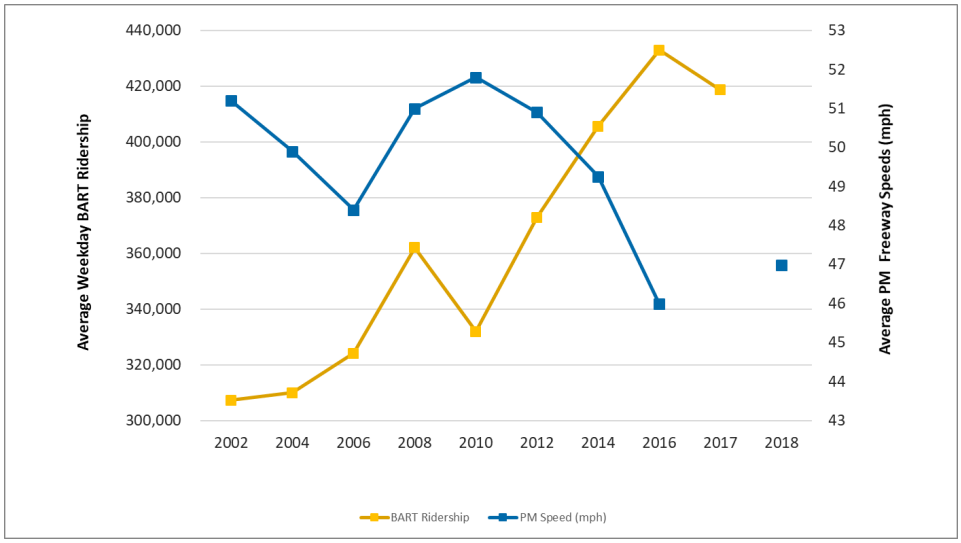


Figure 7-7: PM Peak Average Freeway Speed and BART Ridership[14]

[14] BART Monthly Ridership, March – June https://www.bart.gov/about/reports/ridership

8 | Monitoring Program Results and Next Steps

The improving economy and higher employment level observed in 2018 have resulted in higher travel demands on the transportation network. The change in average speeds on freeways and arterials ranged from a + 1.0 mph speed increase on freeways in the afternoon peak-period, to a + 0.4 mph increase on Tier 1 Arterials in the afternoon peak-period.

This section highlights conformity findings from the 2018 monitoring cycle and summarizes upcoming improvements to the roadway network that may be present in the next monitoring cycle or beyond. Finally, innovative ideas that could further improve the effectiveness of monitoring studies have been identified for potential consideration. These include expanding the use of Big Data for transportation planning, and the inclusion of monitoring of alternative modes countywide.

8.1 | 2018 CMP Conformity

CMP conformity is evaluated for the Tier 1 network in the afternoon peak-period on segments operate at LOS F. There were 47 segments operating at LOS F in 2018 in the afternoon peak-period. Of these 47 segments, nine were exempt from deficiency planning requirements because they were grandfathered as LOS F in the 1991-1992 LOS surveys, and 18 were impacted by construction (including one segment that was also grandfathered). Alameda CTC's travel model was used to estimate interregional trips (one of four possible exemptions identified in state legislation) on the remaining nine segments. After removing trips originating from outside Alameda County, LOS was estimated. Based on this analysis, no new deficient segments were identified.

8.2 | Construction during the 2018 Monitoring Cycle

In 2018, construction and maintenance activities had an impact on road network performance, particularly on major corridors. Although it is not typical for construction to close lanes during peak hours, they often still impact traffic flows through traffic bottlenecks caused by narrower lanes, the presence of concrete barriers in close proximity to the lanes open to traffic, or rubbernecking by roadway users. Figure 8-1 maps the location of the morning and afternoon congested segments, and associated major construction (see Table 8-1).

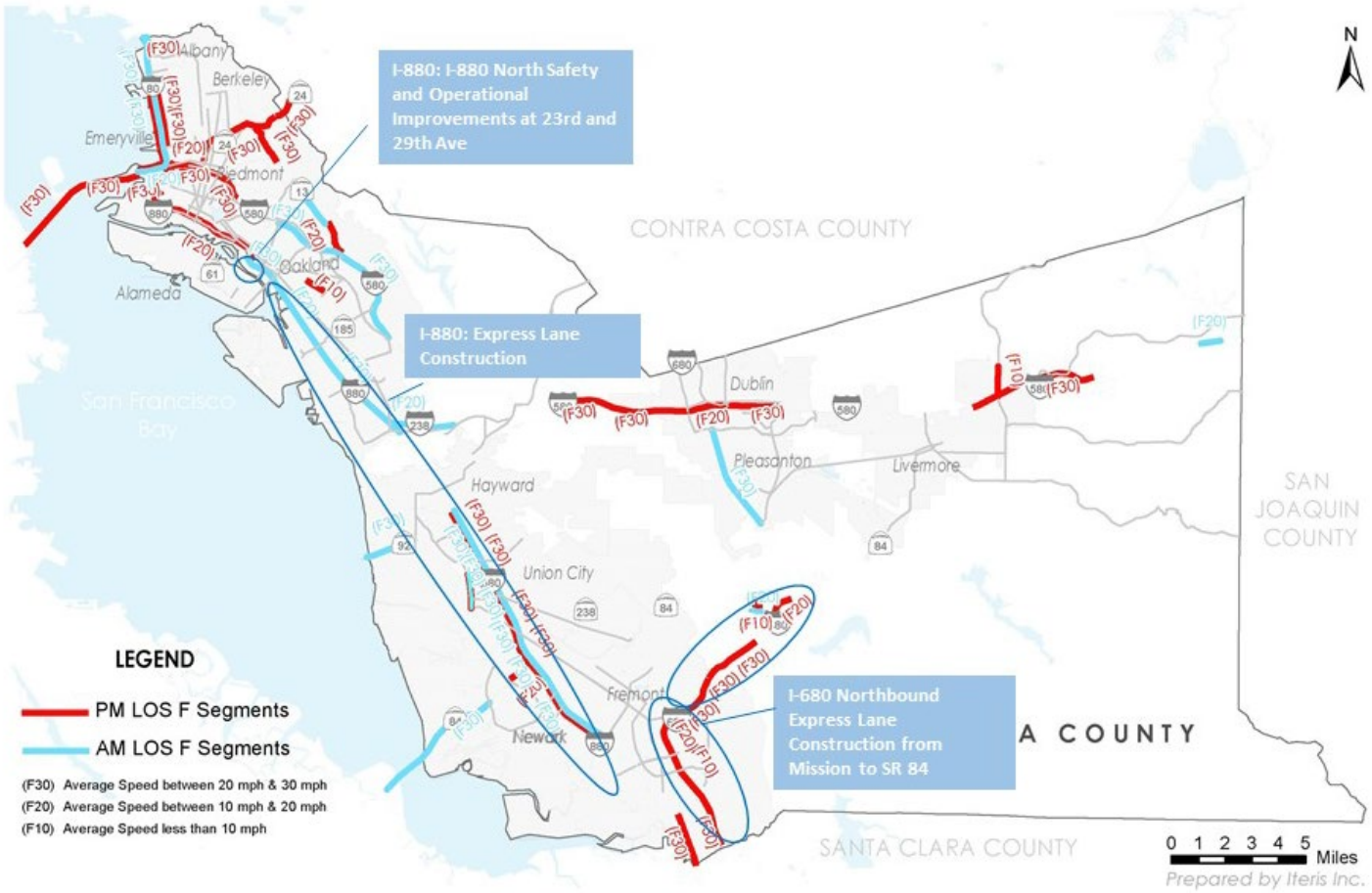


Figure 8-1: 2018 Congested Segments and Construction Activities on the CMP Network

Table 8-1: 2018 Congested Segments and Construction Activities on the CMP Network

Project	Description
Countywide Active Transportation Plan	The purpose of the Alameda Countywide Active Transportation Plan (CATP) is to guide Alameda CTC in coordinating and facilitating implementation of pedestrian and bicycle facilities and programs throughout Alameda County. The plan's goals are to improve safety and multimodal connectivity, encourage walking and biking, and make impactful investments that expand the network of walking and biking facilities accessible to all ages and abilities.
San Pablo Avenue Multimodal Corridor Study	This Project will improve mobility, efficiency, and safety for all modes in order to sustainably meet current and future transportation needs, and help support a strong local economy and growth along the corridor. Improvements will be identified for San Pablo and parallel and perpendicular roadways, possibly including transit priority treatments, enhanced bus stops or stations, pedestrian and bicycle safety improvements, and efficiency of auto operations. Short-, medium- and long term improvements will be identified, prioritizing the movement of feasible projects towards implementation the near-term
E-14/Mission Blvd Multimodal Corridor Study	This project consists on an extensive analysis of existing conditions, planned land uses, and transportation improvements with the purpose of improving efficiencies in corridor operations, safety, and transit performance in order to effectively accommodate growth from new housing and jobs and meet the multimodal transportation demands of all the corridor users. The Corridor provides critical north-south connections throughout the inner East Bay paralleling Interstate 880 while connecting two major east-west crossing bridges, the San Mateo and Dumbarton bridges, and major commute corridors to the Tri-Valley. This important corridor entails approximately 28 miles in length and includes the jurisdictions of San Leandro, Hayward, Union City, Newark, Fremont, and Alameda County's unincorporated areas of San Lorenzo, Ashland, and Cherryland. It is anticipated that the scoping phase (Project Study Report) will be completed in the summer of 2019.
Rail Strategy Study	The study includes technical analysis of opportunities to improve the inter-regional rail access to and from the Port of Oakland, including understanding the needs of passenger rail services that share railroad right-of-way with freight, and proposes a prioritization framework for advancing grade crossing improvements along key rail corridors. The Study is an outgrowth of recommendations contained in the Countywide Goods Movement Plan and the Countywide Transit Plan, and transitions from high-level planning to a document with discrete, implementable improvements with defined cost, scope, and schedule.
I-580 Design Alternatives Assessment	The Design Alternative Assessment (DAA) will evaluate traffic and throughput needs for this segment of I-580 and identify a list of feasible, near- and mid-term project concepts that can be advanced to project development. I-580 is one of Alameda County's key transportation routes, carrying over 200,000 vehicles per day in its most heavily used segments and serving as a primary conduit to the Transbay/Bay Bridge corridor. Given worsening congestion associated with Bay Bridge traffic and constrained right-of-way, MTC has identified the segment of I-580 from SR-238 in Castro Valley to I-80 in Oakland in Alameda County as a candidate for managed lanes as part of its Managed Lanes Implementation Plan effort. MTC has proposed to conduct a DAA for this segment in partnership with Alameda CTC in order to evaluate this corridor further and identify potential improvements,
Advanced Data Collection and Analytic Technologies Request for Information (RFI)	In April, 2018, Alameda CTC released a RFI to seek new ideas and effective applications of emerging data collection and analytics technologies. Alameda CTC routinely uses various types of transportation data in the county's multimodal transportation system planning and performance monitoring and reporting. Alameda CTC is currently determining the next steps towards applying the information obtained through the RFI.

Major construction during the 2018 monitoring period included:

- I-880 Express Lanes: Conversion of HOV lanes to Express Lanes
- I-880: 23rd and 29th Overcrossing Projects
- I-680 Improvements: Roadway Rehabilitation and Construction of HOV/Express Lane
- I-80: Installation of fiber optic cables along I-80 EB (from Toll Plaza to I-780/I-80)

I-580 Improvements: Resurfacing, pavement restoration on mainline and ramps; and installing ramp metering

- I-580/I-80/I-880 Separation: Cleaning and upgrading of structural steel girder/sign panels
- SR-84: Widening of two SB lanes to four, from 0.1-mile south of Ruby Hill Drive to 0.6-mile north of Concanon Boulevard

8.3 | Existing and Future Planned Network Improvements

In March 2016, Alameda CTC approved the Measure BB Capital Project Delivery Plan (CPDP), which included 20 specific projects for delivery with Alameda CTC serving as project manager. This Plan is based on the 2014 Transportation Expenditure Plan (TEP), which was passed by voters for a potential funding of $8 billion.

There are also many other improvement projects in various project development, programming, or planning stages as shown in Table 8-1.

Table 8-1: Future Improvements

Project	Scope	Current Status
I-80 Gilman Interchange Reconstruction	The proposed project will reconfigure the I-80/Gilman St. Interchange located in northwest Berkeley. The project will improve traffic on local streets and frontage roads, and improve bicycle and pedestrian regional connectivity by completing a gap in the Bay Trail.	Planning
I-880 North Safety & Operational Improvements at 23rd & 29th Ave	This project proposes to construct operational and safety improvements on I-880 at the existing overcrossing of 23rd Ave in the City of Oakland connecting to Alameda	Construction Underway
I-880 Express Lanes	HOV-to-express lane conversion between Hegenberger Rd/ I-238 and the Santa Clara County Line.	Construction Underway
I-680 NB Express Lanes	HOV/express lane implementation from SR-237 to north of SR-84 including additional auxiliary lanes and allowances for tolling infrastructure. This project is currently in the Environmental Phase.	Construction Underway
International Blvd BRT	AC Transit's BRT will operate between downtown Oakland and San Leandro (spanning 9.5 miles) primarily utilizing historic International Blvd/East 14th St.	Construction Underway

Project	Scope	Current Performance
I-880 to Mission Blvd East-West Connector	This project will construct an improved east-west connection between I-880 and Route 238 (Mission Boulevard) and is a combination of new roadways, improvements to existing roadways and improvements to intersections along Decoto Road, Fremont Boulevard, Paseo Padre Parkway, Alvarado-Niles Road and Route 238 (Mission Boulevard). PSE completion is expected in 2017.	Planning
Oakland-Alameda Access Project	The I-880 Oakland-Alameda Access Project (formerly called the I-880 Broadway-Jackson Project) proposes to improve connectivity between I-880, I-980 and the cities of Alameda and Oakland.	Planning
East Bay Greenway	The Project proposes to construct a bicycle and pedestrian facility that will generally follow the BART alignment for a distance of 16 miles and traverse the cities of Oakland, San Leandro, and Hayward as well as the unincorporated communities of Ashland and Cherryland. The Project connects seven BART stations as well as downtown areas, schools, and other major destinations.	Planning
SR-262 (Mission Boulevard) Cross Connector	The SR-262 (Mission Boulevard) Cross Connector Project will change geometry at the SR-262/I-680 Interchange, provide a grade separation at the SR-262/Warm Springs intersection, widen SR-262 to six lanes between SR-262 and I-680, construct a HOV/Express Lane to HOV/Express Lane direct connector between I-880 and I-680, and provide a grade separation on SR-262 to separate local and regional traffic.	Planning
I-680 Express Lane Gap Closure	This project will widen the existing freeway to accommodate HOV/Express Lanes together with auxiliary lanes to transition traffic between local streets and the freeway between interchanges, add a new nine-mile HOV/Express lane between Auto Mall Parkway and SR-84, and change the I-680 Southbound Express Lane access configuration.	Under Construction

8.4 | Recommendations for Future Monitoring Studies

Significant improvements were made to LOS monitoring methodology in the 2014 monitoring cycle, such as the use of commercial data, inclusion of HOV/express lanes and bridges for separate monitoring, and developing an arterial classification for the Tier 2 network, which were also carried over to the 2018 cycle. In 2016, commercial speeds data was used exclusively for Tier 1 freeways, based on the validation effort. Since 2014, the quality of INRIX data has improved substantially – and it is now the primary data source for both Tier 1 and Tier 2 segments. For Tier 1 roads, INRIX was supplemented with floating car surveys where INRIX had no coverage or deemed unreliable. Transit monitoring was performed for the first time in 2018. To continue improving the monitoring methodology and to expand the scope of LOS monitoring for larger level applications, Alameda CTC could consider the following recommended enhancements.

8.4.1 | Conflation CMP Segment with Commercial Speed Reporting Segment

By the 2020 monitoring cycle, MTC will make fine-grained INRIX XD available to Alameda CTC. These data were purchased and used for 34 CMP segments for the 2018 monitoring cycle, as INRIX TMC data was not capable of providing speeds to attain desired spatial granularity, which resulted in deterioration of LOS for consecutive CMP segments. The INRIX XD dataset covers more roads which can be added to the Tier 2 network where coverage of INRIX data was inadequate. It also provides detailed traffic speeds at a granular level of 800 feet increments. As a result, the INRIX XD data will allow future monitoring reports to quantify the traffic performance at a finer scale. Implementation of CMP monitoring using the XD-encoded network will require some efforts to conflate the INRIX XD segments to the CMP segment. However, the data fields reported along the INRIX XD-encoded network are expected to remain the same, and will not impede or bias the CMP's performance measures (average speeds, LOS, duration of congestion, traffic delays, etc).

8.4.2 | Review CMP Segment and Update GIS Database

In the 2018 monitoring cycle, Alameda CTC included an additional 225-miles of Tier 2 major arterials and rural roadways. Limitations encountered with the updated CMP roadway segments (mostly arterials) in compiling the 2018 monitoring results included:

- A number of the new Tier 2 segments are relatively short roadway segments (less than half mile). During the CMP monitoring and review, It was suggested that a complete countywide inventory of Tier 2 segments be performed to ensure Tier 2 segments are consistent with the other Tier 2 segments, match surrounding land use transition points, and reflect updates from traffic operational improvements.
- Segment descriptions in the CMP network GIS database were not descriptive enough to effectively aid field data collection efforts and when populating the tables in the report. Alameda CTC may consider reviewing and updating the descriptions (regarding segment limits) in the GIS database.
- Updates to CMP roadway segment data in the GIS system are needed periodically. CMP roadway segment limits should match surrounding land use transition points, or reflect updates from traffic operational improvements, such as conversion of a two way street to one-way.

8.4.3 | Expanding the Use of Big Data for CMP Monitoring

For the 2020 monitoring cycle, Alameda CTC could consider expanding the use of commercial speed data to survey all HOV/express lanes as well, if such suitable data becomes available. Commercial speed data

providers have continued to make progress in developing new and improved products and services. It is very plausible that in the near future, major commercial transportation data providers (i.e., HERE and INRIX) will be offering speed and travel time data separated out by lane-type, and separate speed and travel-time data for HOV/Express lanes and for general purpose lanes on freeway facilities. The FHWA National Performance Management Research Data Set (NPMRDS) already segregates truck and auto mode traffic for facilities that are a part of the National Highway System. Alternatively, Alameda CTC can use the commercial speed data collected from the managed lanes, for further cost savings and data consistency.

For data on active transportation modes (walking and biking), Alameda CTC may explore newer data sources from providers such as Strava Metro that aggregate crowd-sourced bicycle and pedestrian activity into commercial data products. These data can be filtered by commute or recreational purposes, and can be used to monitor bicycle travel times and route choice and to evaluate the success of new multimodal infrastructure. In both datasets, the sample size would significantly exceed that used for the existing monitoring efforts for those who walk and bike in Alameda County.

In 2018, Alameda CTC expanded monitoring to include estimation of travel time reliability and the duration of congestion on freeways. In addition to absolute measures of travel time and speeds, reliability is a key aspect of roadway performance experienced by drivers. Drivers value not only the amount of time to complete the trip, but also the reliability in travel time. Reliability metrics shed light on how much extra time drivers needs to add to their average travel time, how much delay is faced by a vehicle travelling along a roadway segment, and how travel time varies over time. In future monitoring, this analysis may be expanded to include the arterial network as well.

8.4.4 | Expanding the Visualizations Included in the Monitoring Report

For the 2020 Monitoring Report, Alameda CTC may consider including additional graphics and summary snapshots of the results. Providing visualization of data points can better engage and inform the various stakeholders, including policy makers, and the public about monitoring traffic congestion. Additionally, these displays can provide insight into the severity, duration, and extent of congestion. Two examples are presented in the pages that follow.

Vehicle Hours of Delay (see Figure 8-2): In addition to the LOS and reliability metrics (duration of congestion, delay index) by corridor, which are provided in the 2018 Monitoring Report, plotting Vehicle Hours of

Delay helps to better understand delay experienced by drivers travelling along certain corridor over times.

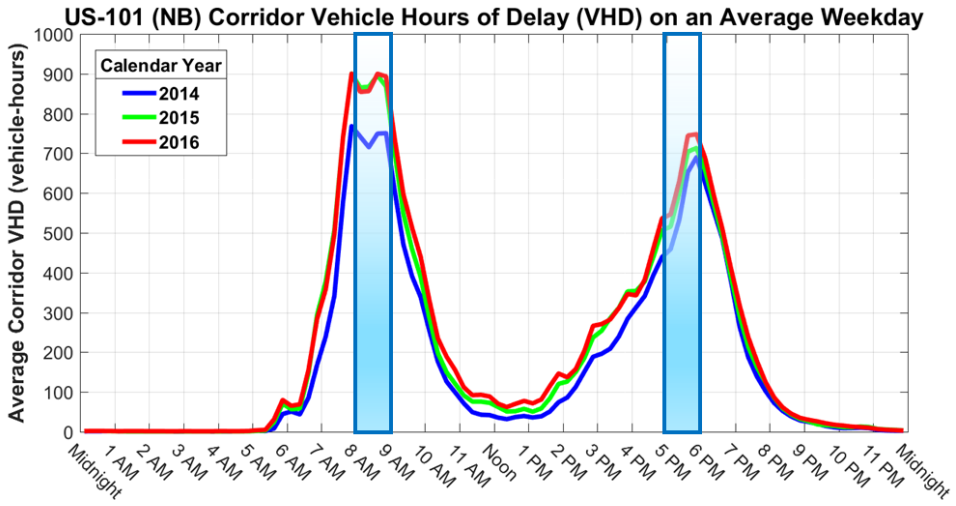


Figure 8-2. Example Vehicle Hours of Delay

Duration of Congestion Plot and Speed Heat Map (see Figure 8-3): For each corridor, this heat map (on the right) plots average speed at a given time (x-axis) and location (y-axis). Stakeholders can view where and when congested conditions are forming. The duration of congestion plot (on the left) adds another dimension—volume—to help better visualize the average hours of delay caused by slower speeds on that corridor through the day. Combining the figures provides valuable insight about where congestion starts, how much delay recurring congestion causes and where the bottlenecks are.

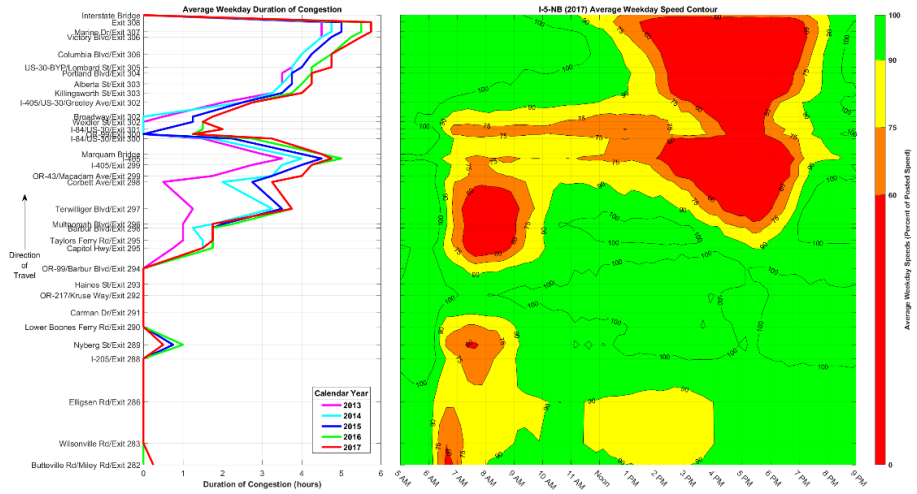


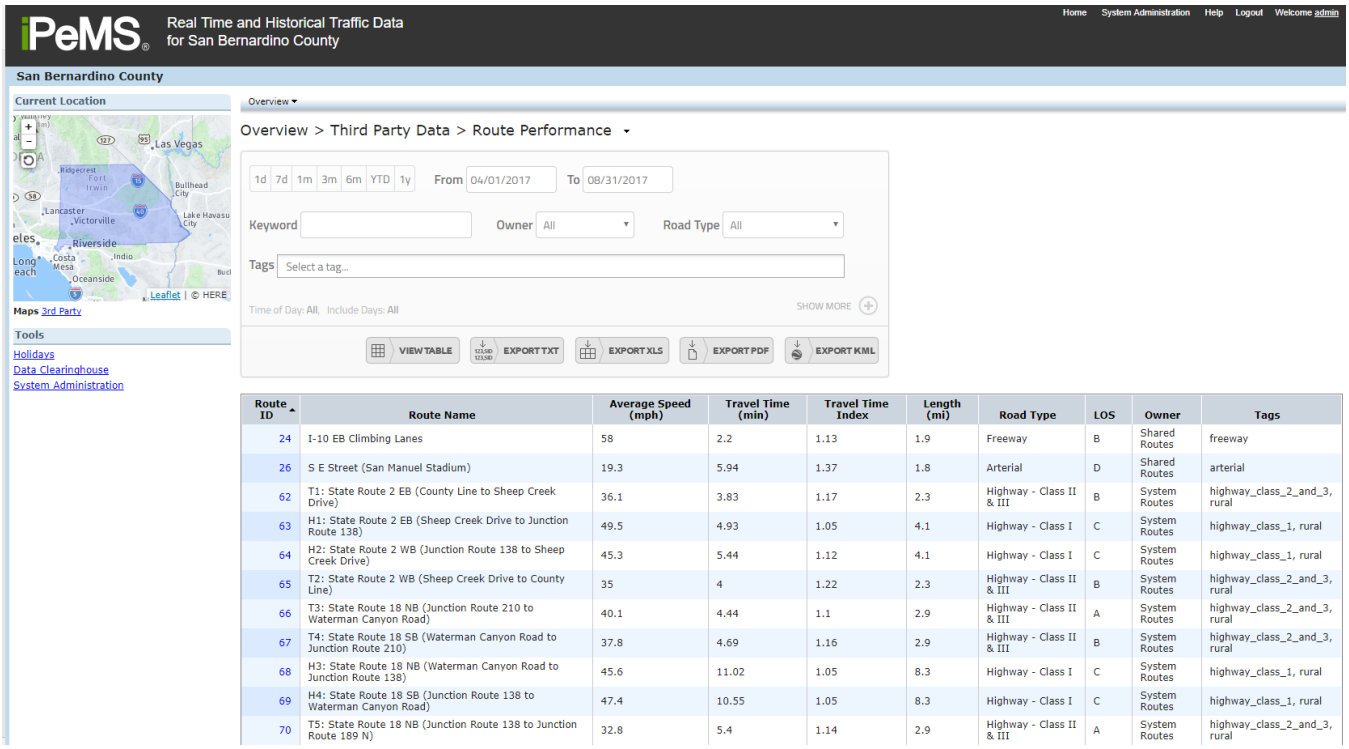
Figure 8-3. Example Duration of Congestion Plot and Speed Heat Map

8.4.5 | Incorporate Web-based Reporting and Tools

In the 2018 monitoring cycle, a static (printed) report was produced to communicate the monitoring results with audiences. In future cycles, making use of currently available advanced presentation options, Alameda CTC could consider presenting monitoring results in a different format such as a web-based interactive dashboard. In recent years, San Francisco County Transportation Authority has developed a web-based report (http://congestion.sfcta.org/) that includes interactive elements allowing users to select the time and mode of transportation for which they would like to read the report, as well as which charts to generate. The web interface offers far more and better ways to engage the public.

Furthermore, Alameda CTC may consider deployment of a platform storing data (INIRX, bike counts, etc.) and dynamically computing the performance metrics. One such example is the iPeMS platform, a real-time data management and performance monitoring tool that is currently used by San Bernardino County Transportation Authority (SBCTA) in part to meet the state CMP legislative requirements. This tool allows users to define CMP segments and automatically aggregates the commercial speed data, creating preselected performance metrics for user-defined date and time ranges. Furthermore, the web-based interactive user tools allow users to readily create performance monitoring reports (see Figure 8-4) for the selected network category or city or sub areas automatically.

Figure 8-4. Example Web-based CMP Performance Report (SBCTA iPeMS)



Route ID	Route Name	Average Speed (mph)	Travel Time (min)	Travel Time Index	Length (mi)	Road Type	LOS	Owner	Tags
24	I-10 EB Climbing Lanes	58	2.2	1.13	1.9	Freeway	B	Shared Routes	freeway
26	S E Street (San Manuel Stadium)	19.3	5.94	1.37	1.8	Arterial	D	Shared Routes	arterial
62	T1: State Route 2 EB (County Line to Sheep Creek Drive)	36.1	3.83	1.17	2.3	Highway - Class II & III	B	System Routes	highway_class_2_and_3, rural
63	H1: State Route 2 EB (Sheep Creek Drive to Junction Route 138)	49.5	4.93	1.05	4.1	Highway - Class I	C	System Routes	highway_class_1, rural
64	H2: State Route 2 WB (Junction Route 138 to Sheep Creek Drive)	45.3	5.44	1.12	4.1	Highway - Class I	C	System Routes	highway_class_1, rural
65	T2: State Route 2 WB (Sheep Creek Drive to County Line)	35	4	1.22	2.3	Highway - Class II & III	B	System Routes	highway_class_2_and_3, rural
66	T3: State Route 18 NB (Junction Route 210 to Waterman Canyon Road)	40.1	4.44	1.1	2.9	Highway - Class II & III	A	System Routes	highway_class_2_and_3, rural
67	T4: State Route 18 SB (Waterman Canyon Road to Junction Route 210)	37.8	4.69	1.16	2.9	Highway - Class II & III	B	System Routes	highway_class_2_and_3, rural
68	H3: State Route 18 NB (Waterman Canyon Road to Junction Route 138)	45.6	11.02	1.05	8.3	Highway - Class I	C	System Routes	highway_class_1, rural
69	H4: State Route 18 SB (Junction Route 138 to Waterman Canyon Road)	47.4	10.55	1.05	8.3	Highway - Class I	C	System Routes	highway_class_1, rural
70	T5: State Route 18 NB (Junction Route 138 to Junction Route 189 N)	32.8	5.4	1.14	2.9	Highway - Class II & III	A	System Routes	highway_class_2_and_3, rural

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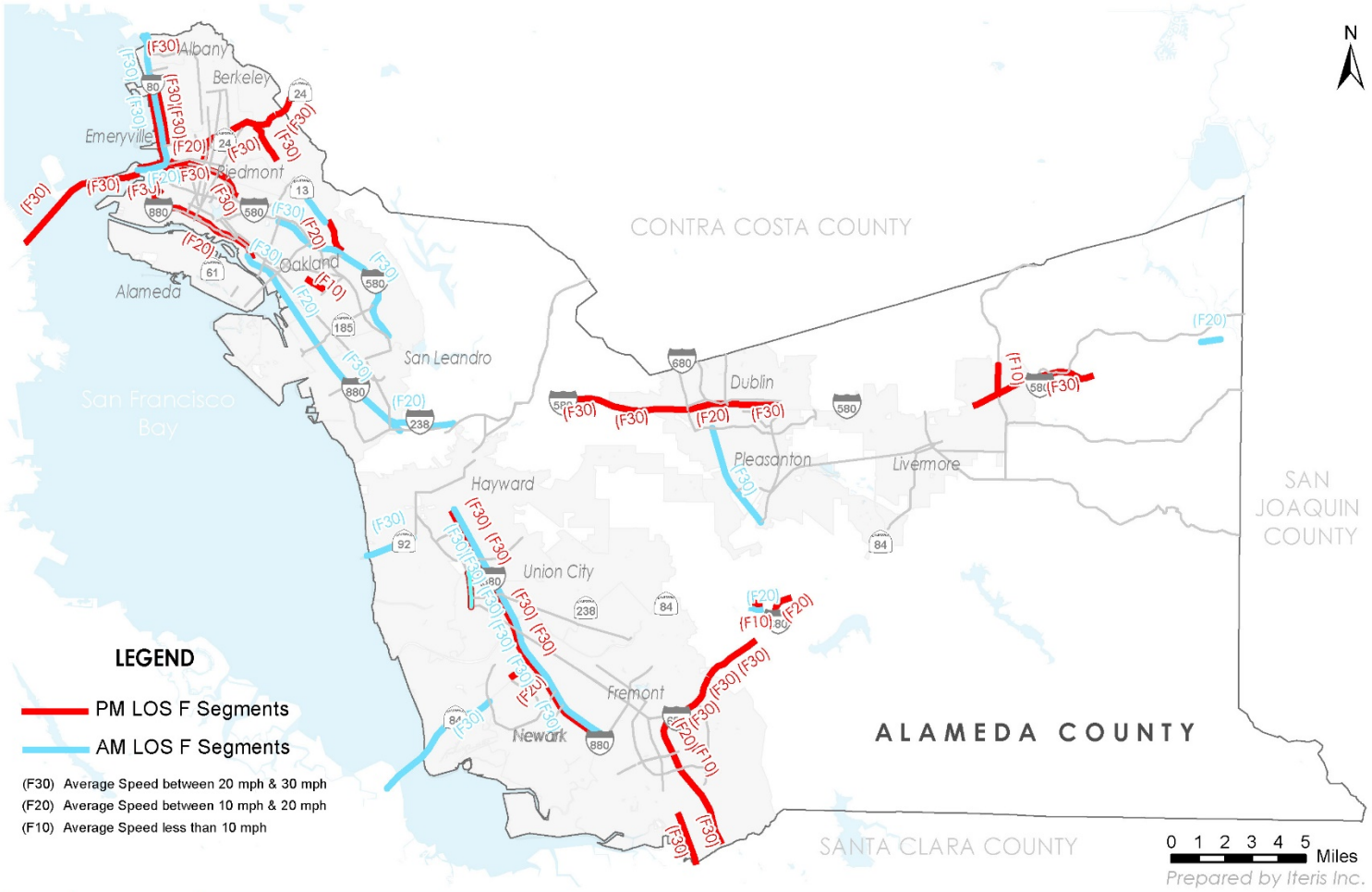
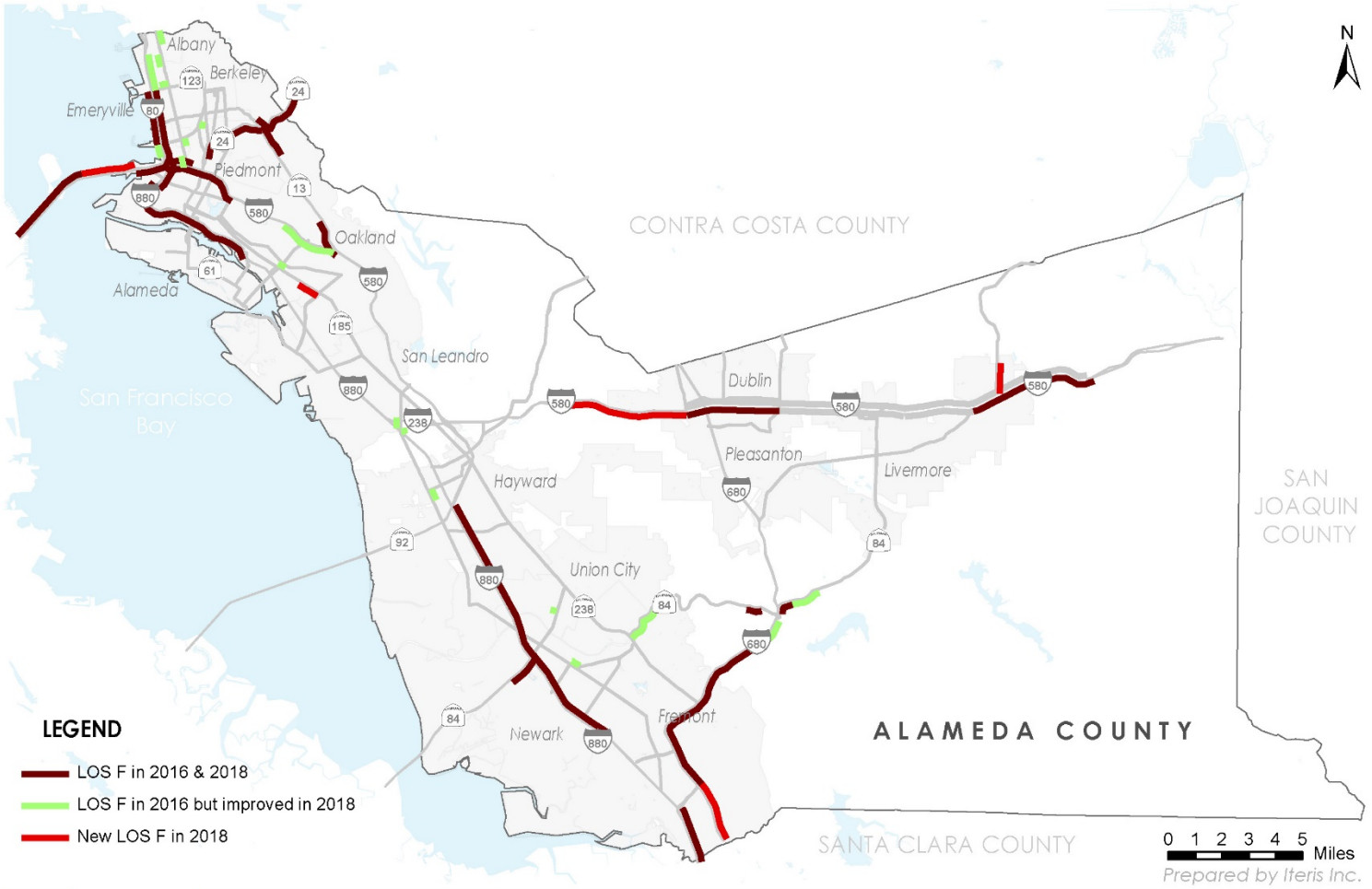
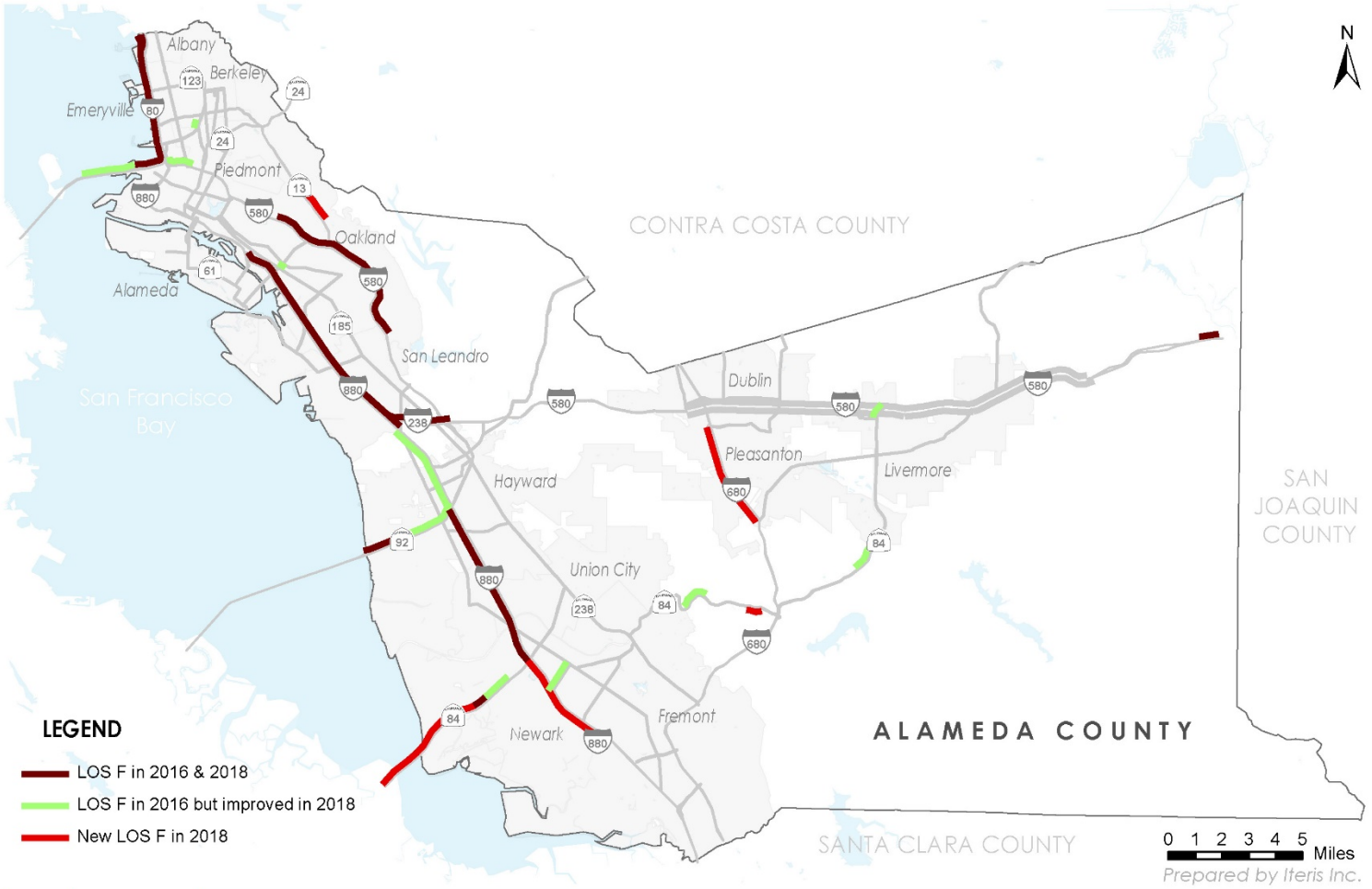
Appendix A | 2018 LOS Maps



2018 LEVEL OF SERVICE MONITORING RESULTS: LOS F SEGMENTS - AM & PM PEAK PERIODs



2018 LEVEL OF SERVICE MONITORING RESULTS: CHANGE IN LOS F FROM 2016 TO 2018 - PM PEAK PERIOD



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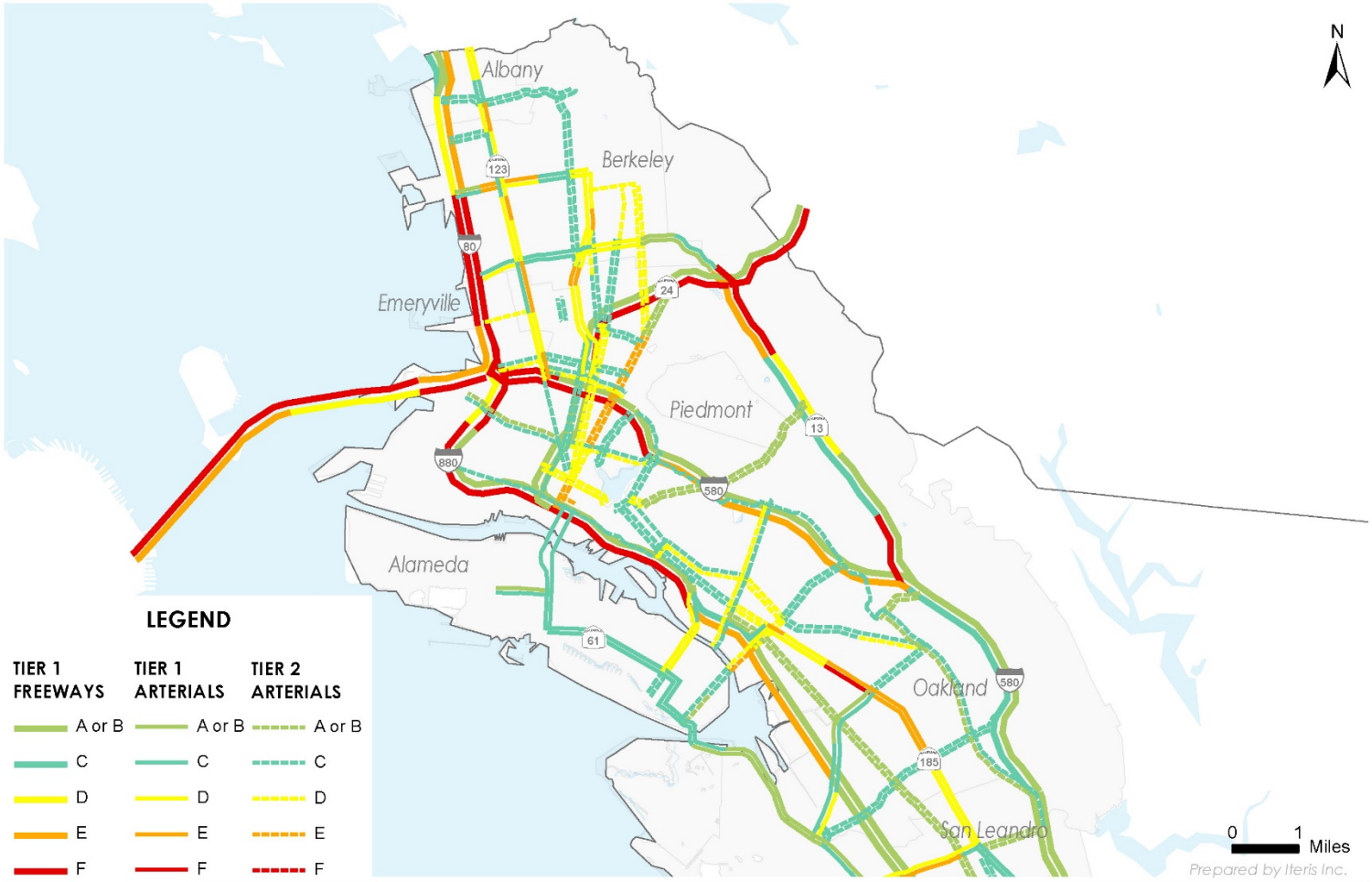
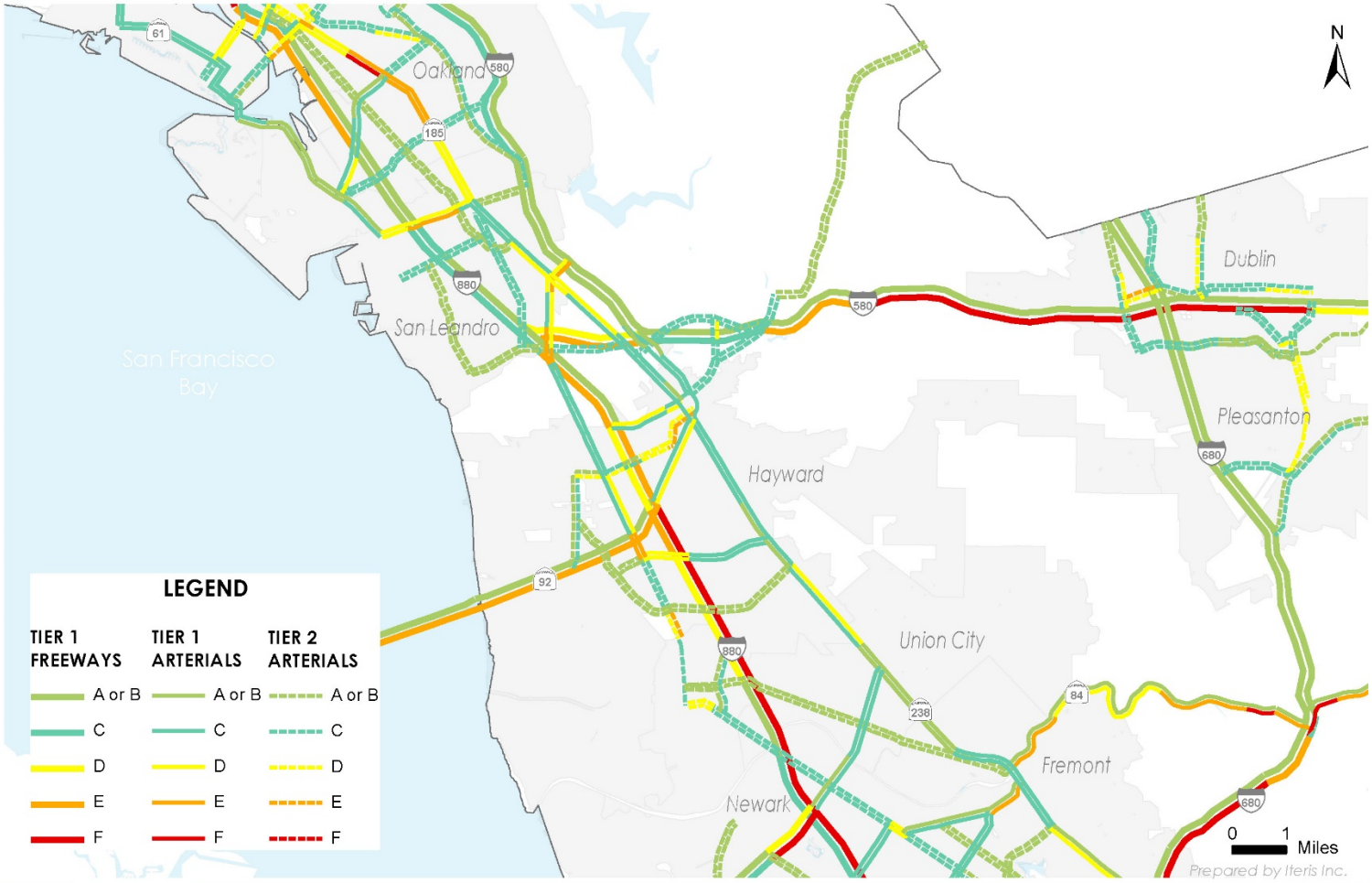
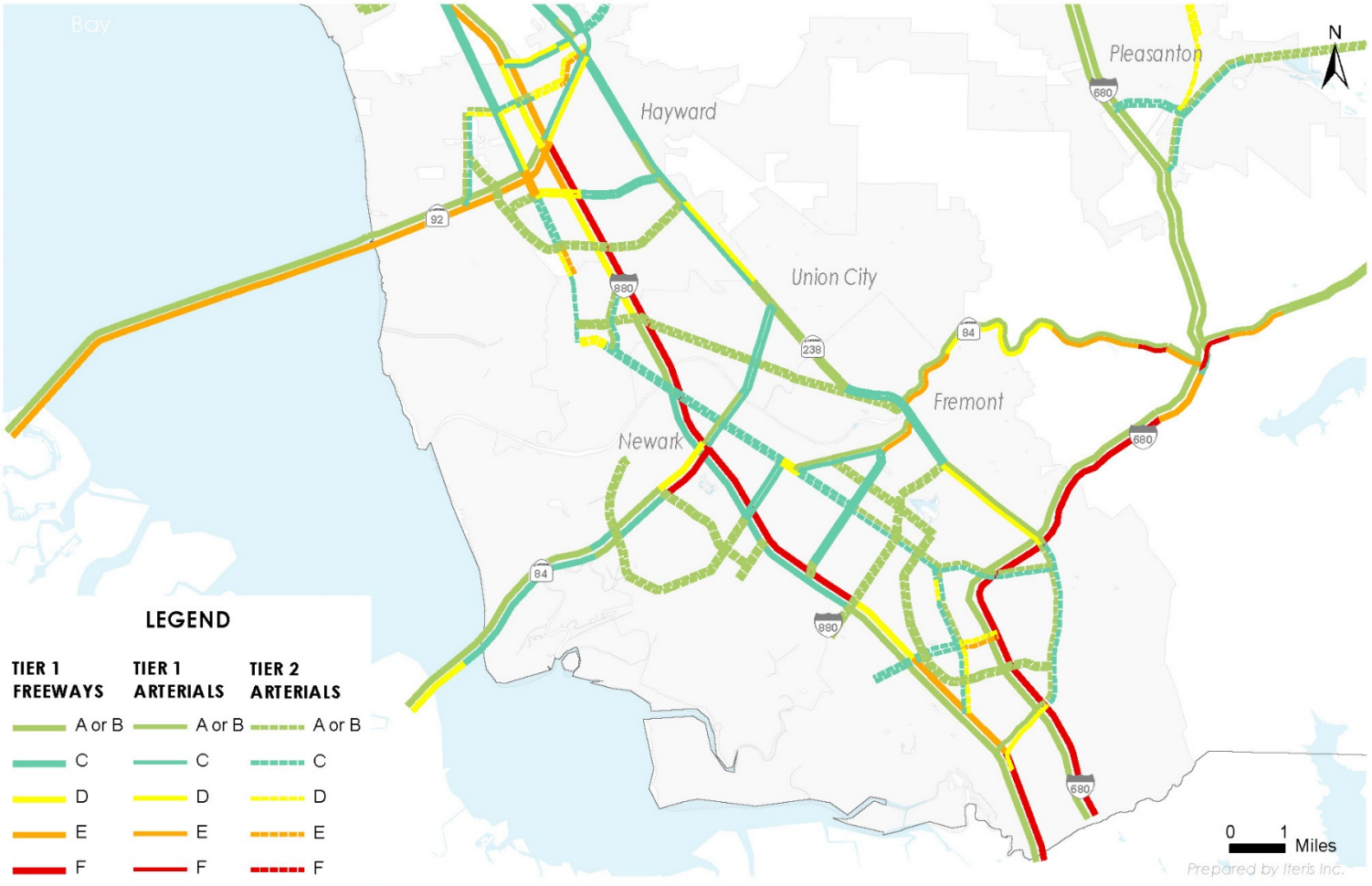


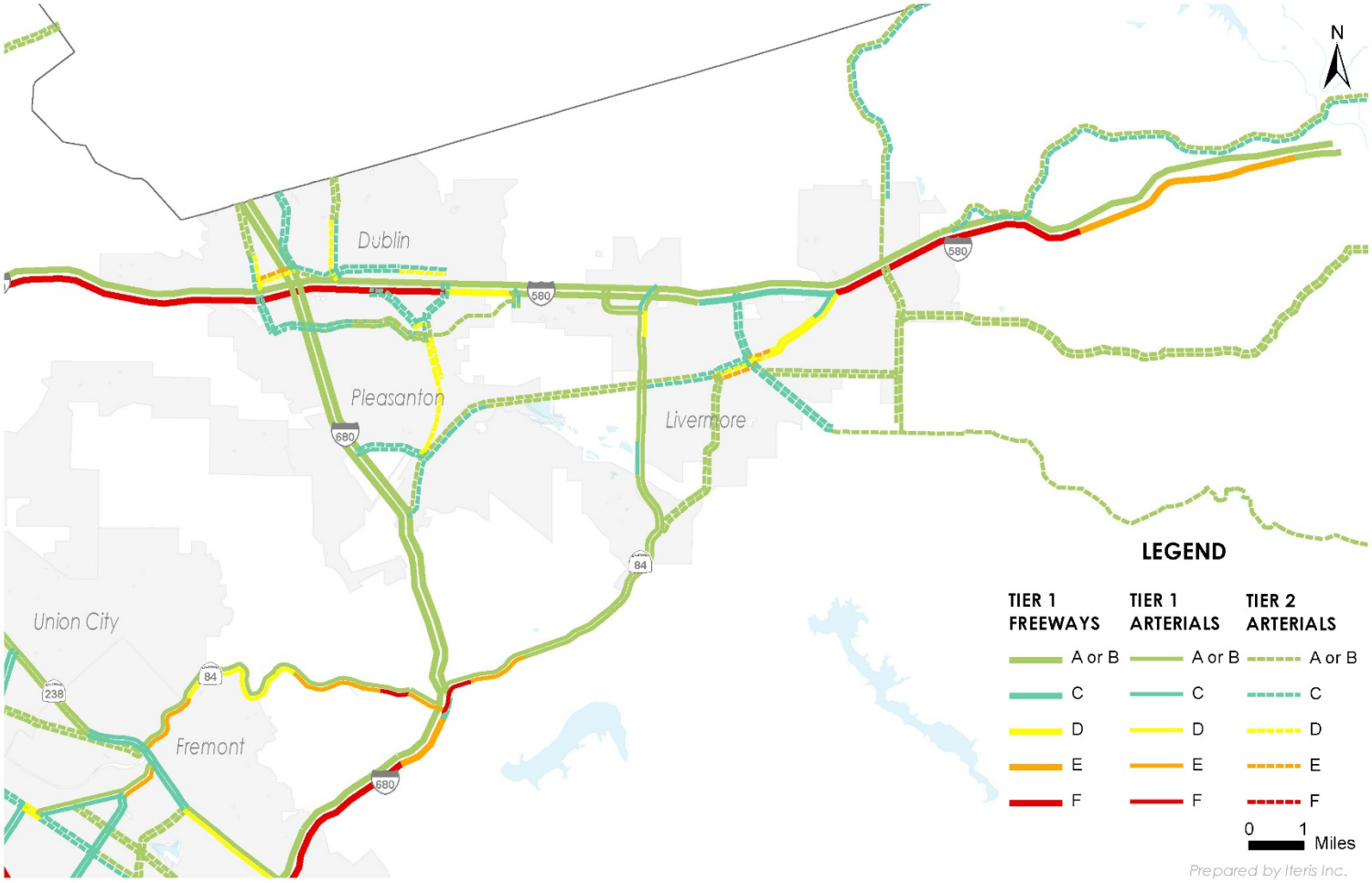
2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (NORTH) - PM PEAK PERIOD (4:00 PM to 6:00 PM)



2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (CENTRAL) - PM PEAK PERIOD (4:00 PM to 6:00 PM)

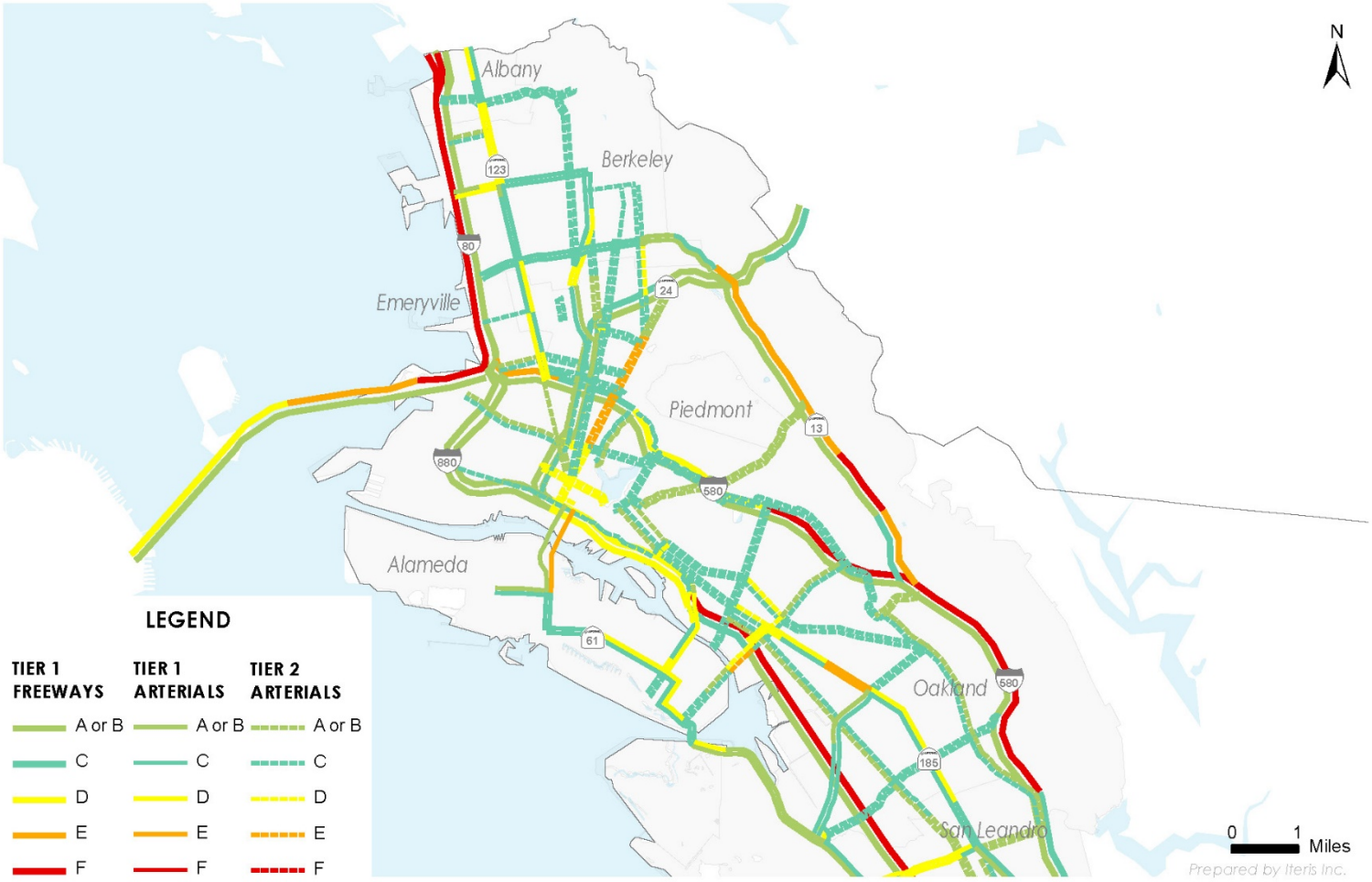


2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (SOUTH) - PM PEAK PERIOD (4:00 PM to 6:00 PM)



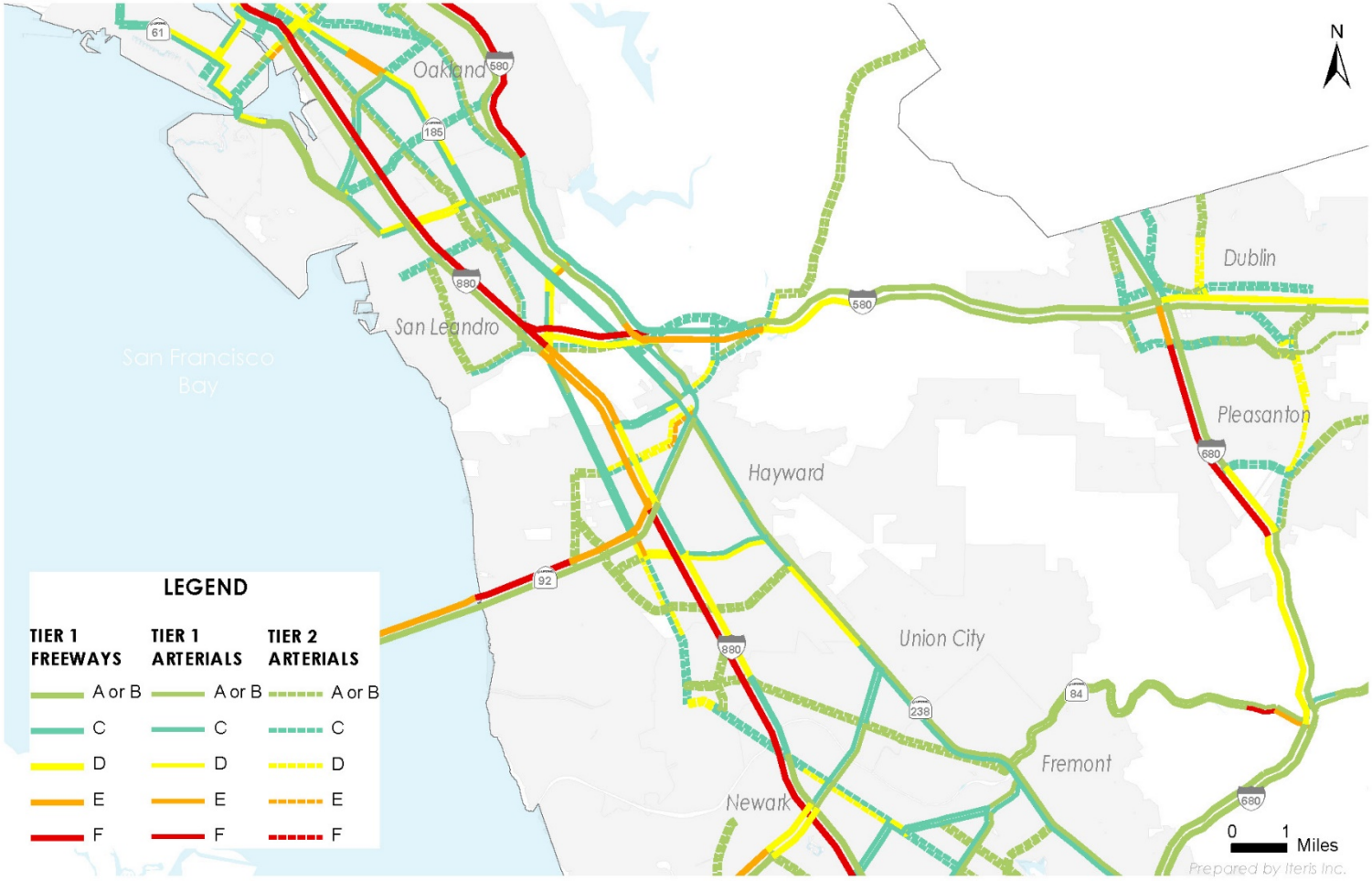
ALAMEDA County Transportation Commission

2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (EAST) - PM PEAK PERIOD (4:00 PM to 6:00 PM)



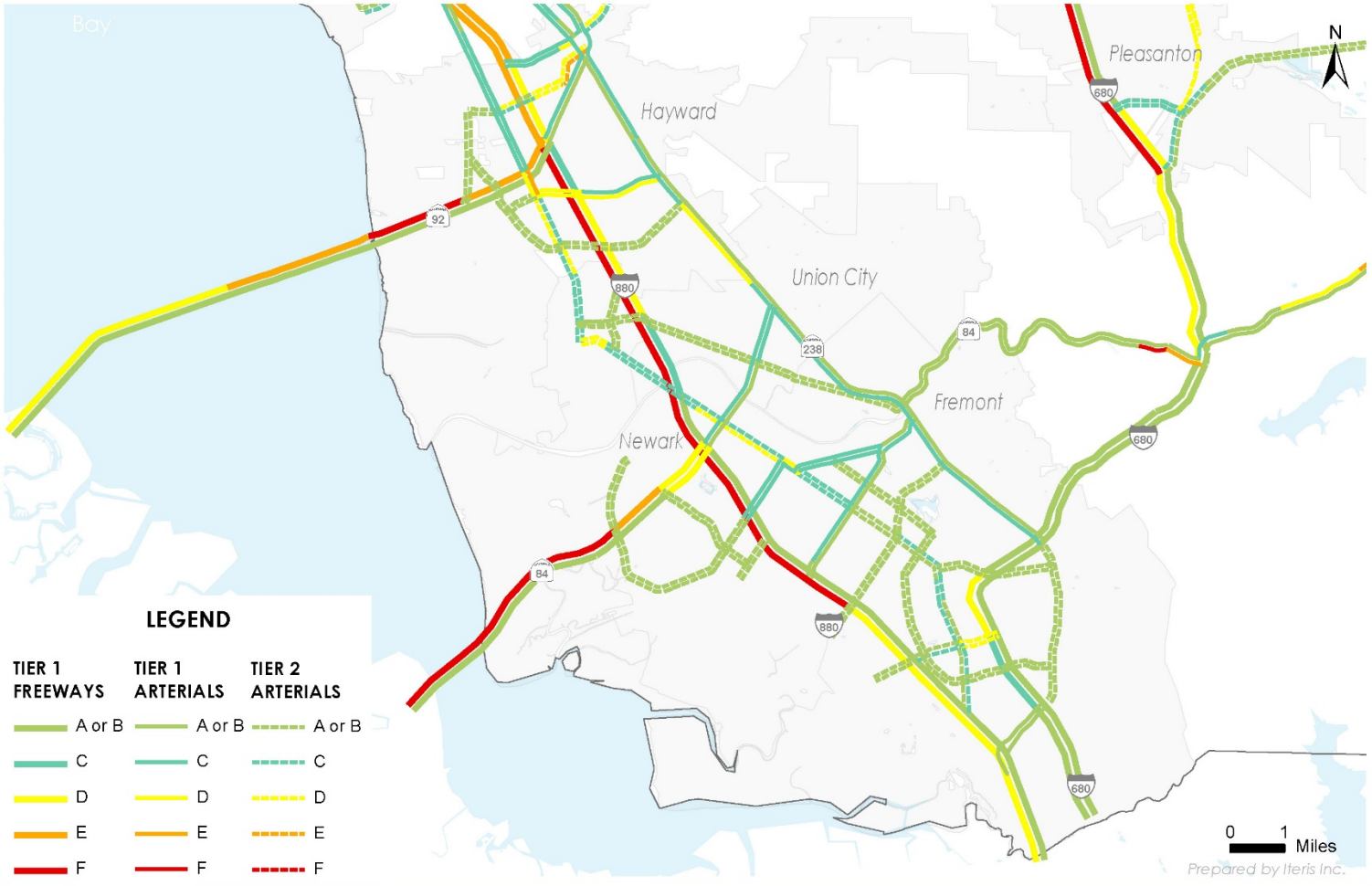
ALAMEDA County Transportation Commission

2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (NORTH) - AM PEAK PERIOD (7:00 AM to 9:00 AM)

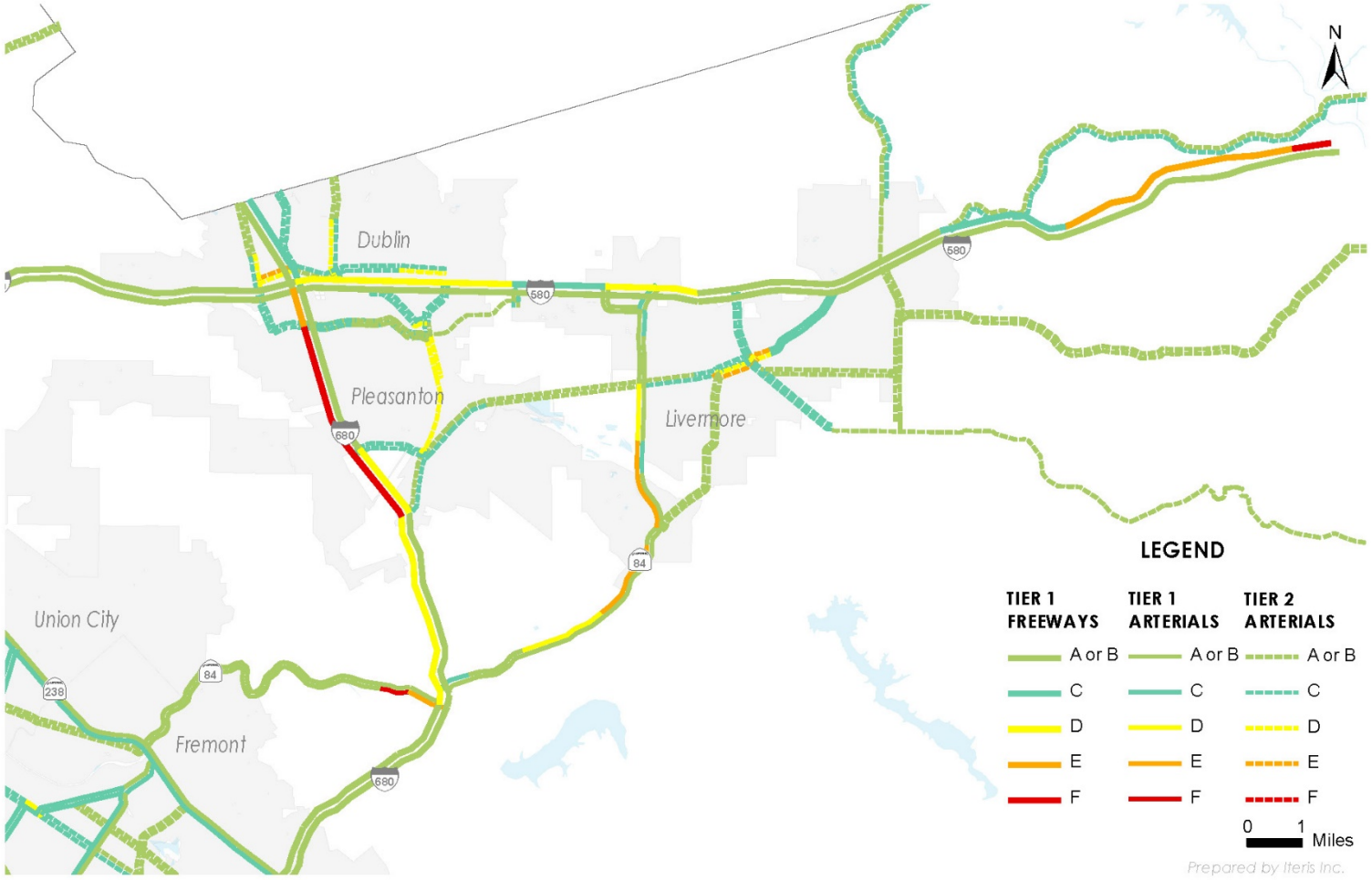


ALAMEDA County Transportation Commission

2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (CENTRAL) - AM PEAK PERIOD (7:00 AM to 9:00 AM)

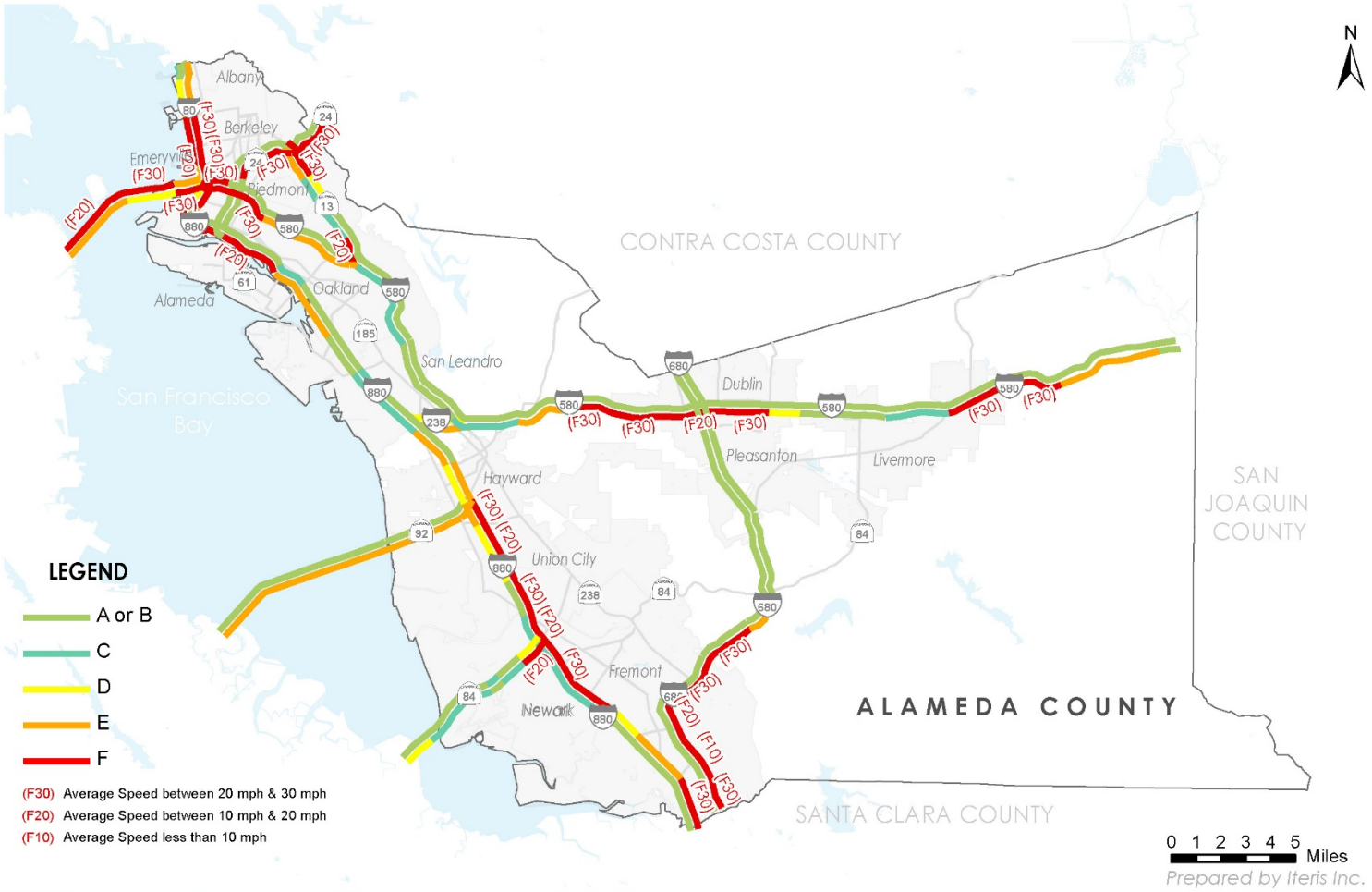


2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (SOUTH) - AM PEAK PERIOD (7:00 AM to 9:00 AM)

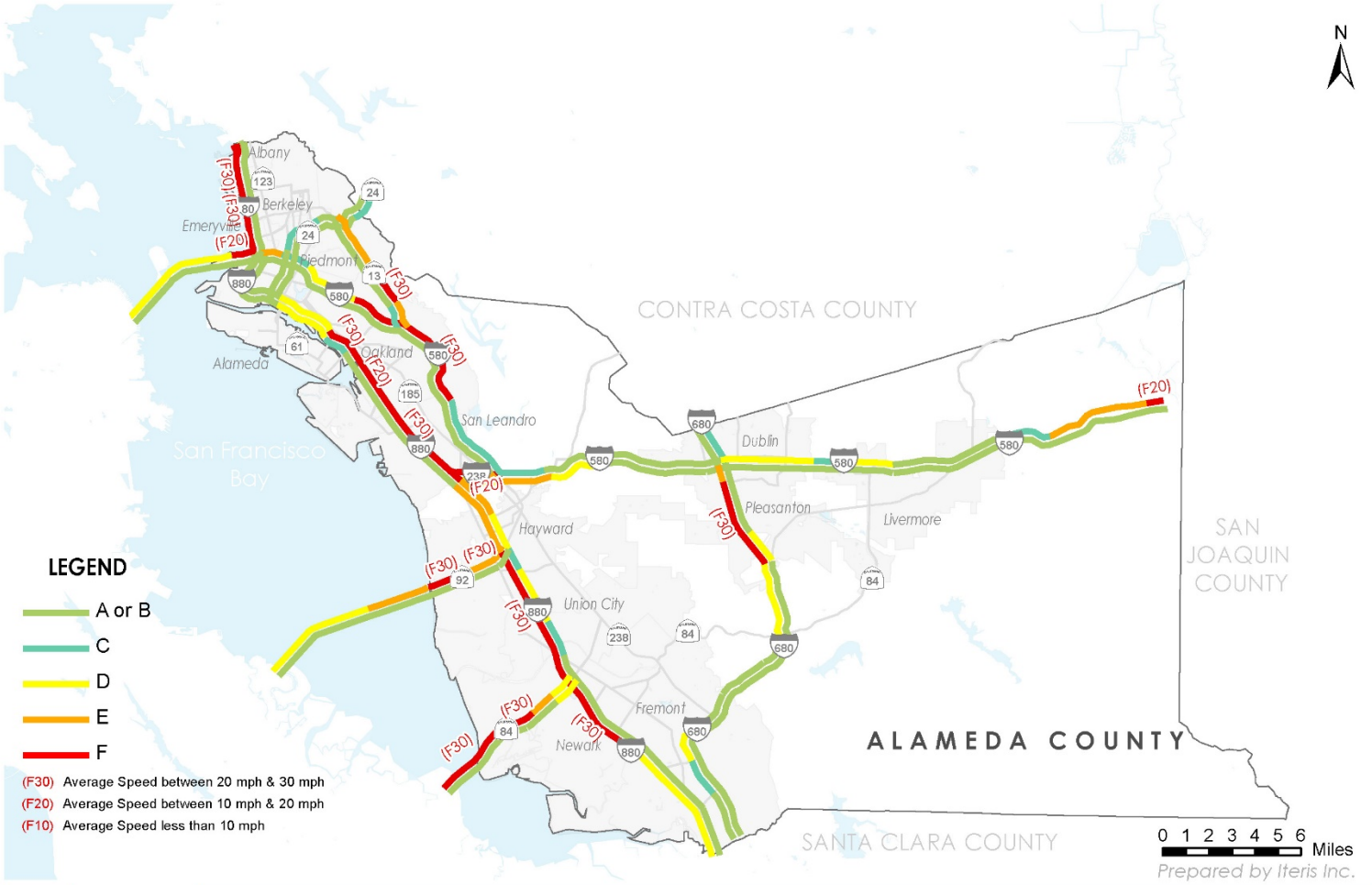


ALAMEDA County Transportation Commission

2018 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (EAST) - AM PEAK PERIOD (7:00 AM to 9:00 AM)

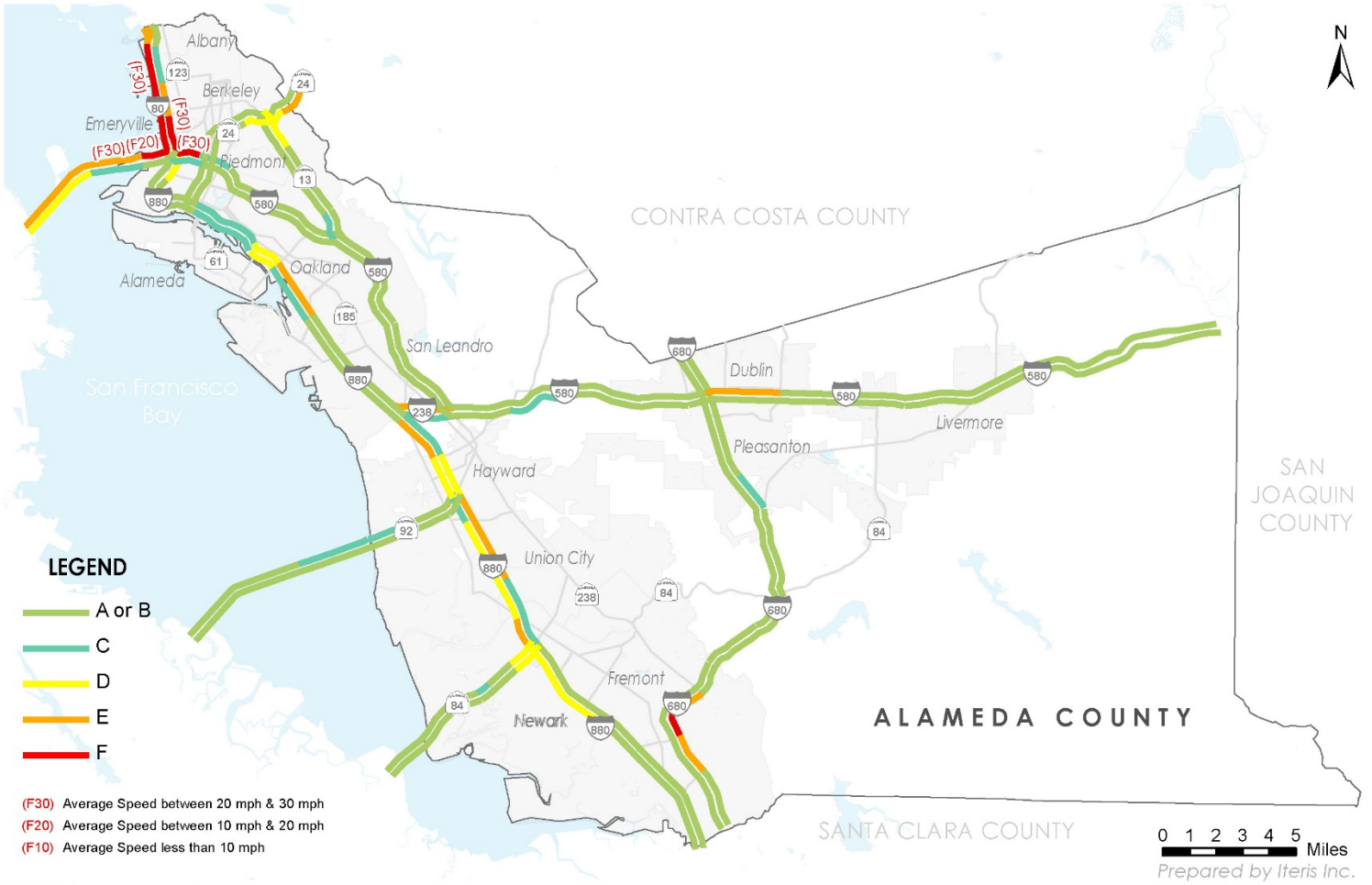


2018 LEVEL OF SERVICE MONITORING RESULTS: TIER 1 FREEWAYS & BRIDGES - PM PEAK PERIOD (4:00 PM to 6:00 PM)

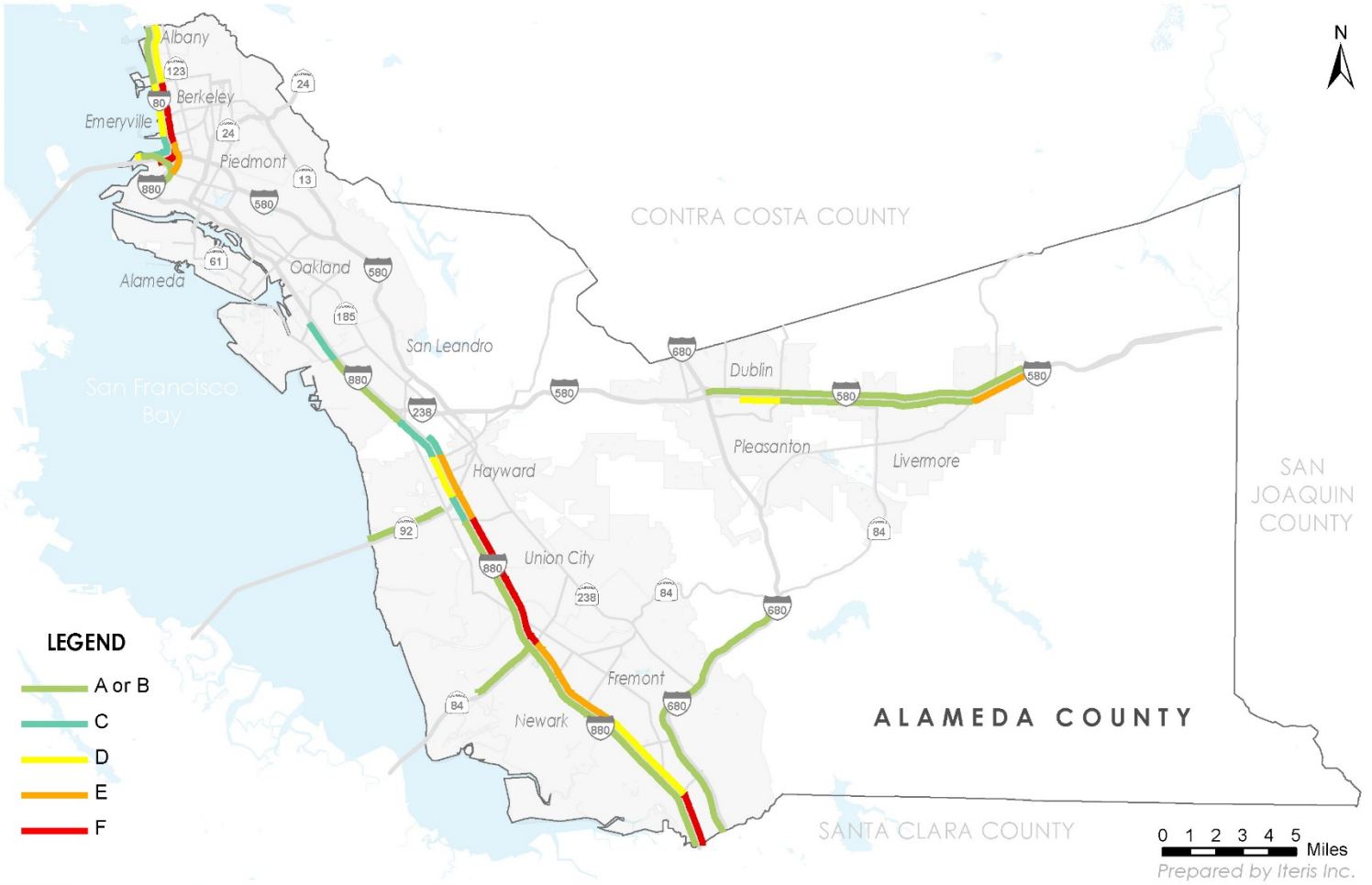


ALAMEDA County Transportation Commission

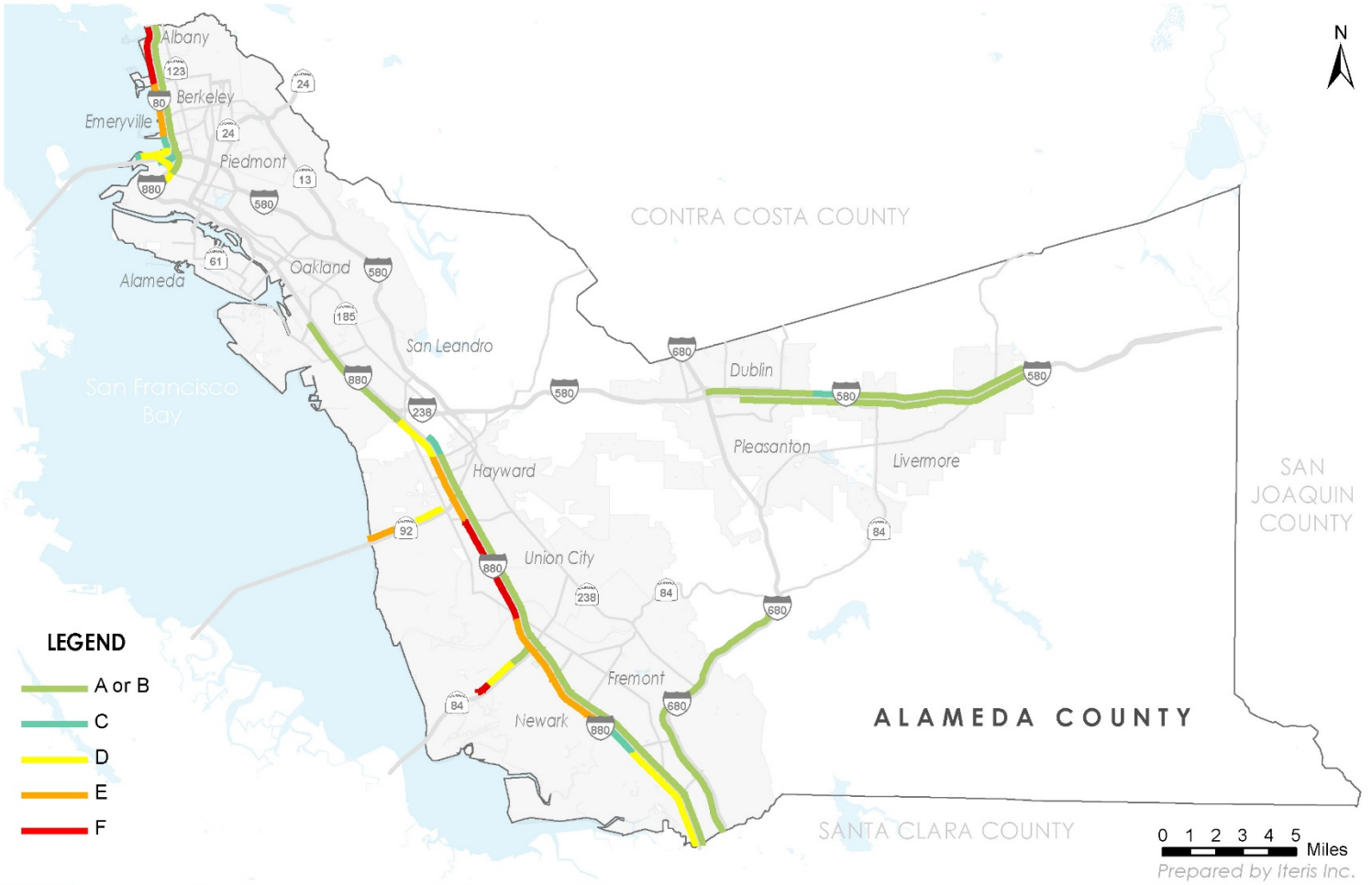
2018 LEVEL OF SERVICE MONITORING RESULTS: TIER 1 FREEWAYS & BRIDGES - AM PEAK PERIOD (7:00 AM to 9:00 AM)



2018 LEVEL OF SERVICE MONITORING RESULTS: TIER 1 FREEWAYS & BRIDGES - WEEKEND



2018 LEVEL OF SERVICE MONITORING RESULTS: HOV & EXPRESS LANES - PM PEAK PERIOD



2018 LEVEL OF SERVICE MONITORING RESULTS: HOV & EXPRESS LANES - AM PEAK PERIOD

Appendix B | 2018 LOS Results

B.1 | Freeways (Tier 1) - PM Peak Period (INRIX data)

Table B-1: 2018 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F1	I-80 - EB	SF County Line	Toll Plaza	Oak	2.01	North	5	3319	52.8	C	3551	46	D
F2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1.3	North	6	3199	17.3	(F20)	3704	21.2	(F30)
F3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery	0.54	North	6	3559	9.9	(F10)	3706	10.9	(F20)
F4	I-80 - EB	Powell	Ashby	Emery - Berk	0.72	North	6	2721	11.5	(F20)	3706	12.8	(F20)
F5	I-80 - EB	Ashby	University	Berk	1.3	North	5	2719	19.9	(F20)	3706	21.2	(F30)
F6	I-80 - EB	University	Jct I-580 (off)	Berk - Alb	1.37	North	5	2628	29.6	(F30)	3349	30.7	E
F7	I-80 - EB	Jct I-580 (off)	Central (County Line)	Alb	0.84	North	4	2990	38.2	E	3706	40	E
F8	I-80 - WB	Central (County Line)	Jct I-580	Alb	0.7	North	4	2990	56.0	B	3705	62.1	A
F9	I-80 - WB	Jct I-580	University	Berk - Alb	1.51	North	6	2628	34.5	E	3588	45.8	D
F10	I-80 - WB	University	Ashby	Berk	1.31	North	5	2719	19.8	(F20)	3706	26.9	(F30)
F11	I-80 - WB	Ashby	Powell	Emery	0.71	North	5	2721	15.2	(F20)	3586	19.1	(F20)
F12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery	0.47	North	6	3559	29.7	(F30)	3705	30.9	E
F13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1.31	North	8	3076	38.5	E	3705	35	E
F14	I-80 - WB	Toll Plaza	SF County	Oak	2.01	North	4	3319	32.6	E	3706	23.6	(F30)
F15	I-238 - EB	I-880	I-580	Uninc-San L	2.59	Central	3	1910	32.8	E	1795	39.7	E
F16	I-238 - WB	I-580	I-880	Uninc-San L	2.48	Central	3	1910	48.9	D	1792	43.9	D
F17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Uninc	2.68	Central	5	3320	43.5	D	3706	54.1	C
F18	I-580 EB	Grove	Eden Canyon	Uninc - Plea	2.19	East	4	3205	41.1	D	3226	39.6	E
F19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc - Plea	4.82	East	4	2483	34.8	E	3587	23.9	(F30)
F20	I-580 EB	San Ramon/ Foothill	I-680	Plea	0.71	East	4	2846	23.0	(F30)	3706	14.9	(F20)
F21	I-580 EB	I-680	Hopyard	Plea	0.87	East	6	2604	22.0	(F30)	3586	14.8	(F20)
F22	I-580 EB	Hopyard	Santa Rita	Plea	1.9	East	6	2842	28.7	(F30)	3469	26.7	(F30)
F23	I-580 EB	Santa Rita	El Charro	Uninc-Pleas	1.25	East	6	3201	42.2	D	3587	45.8	D
F24	I-580 EB	El Charro	SR 84/Airway Blvd.	Uninc	1.72	East	6	2961	52.8	C	3587	60.7	A
F25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	1.73	East	5	2961	50.5	C	3706	63.7	A
F26	I-580 - EB	Portola	1st St	Liv	2.56	East	5	2396	31.3	E	3469	51.5	C
F27	I-580 - EB	1st St	Greenville	Liv	2.13	East	6	2029	14.1	(F20)	3346	22.8	(F30)
F28	I-580 - EB	Greenville	N.Flynn	Uninc	2.73	East	4	3200	27.6	(F30)	3589	21	(F30)

Table B-1: 2018 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F29	I-580 - EB	N.Flynn	Grant Line	Uninc	4.32	East	4	2963	47.1	D	3586	33.7	E
F30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	0.87	East	5	3437	56.4	B	3706	58.8	B
F31	I-580 - WB	I-205 (SJ Co)	Grant Line	Uninc	0.72	East	5	2756	68.2	A	3337	69.3	A
F32	I-580 - WB	Grant Line	N Flynn	Uninc	4.59	East	4	2603	65.7	A	3706	66.8	A
F33	I-580 - WB	N Flynn	Greenville Rd	Liv - Uninc	2.43	East	5	3200	67.3	A	3706	67.3	A
F34	I-580 - WB	Greenville Rd	1st St	Liv	2.21	East	4	2030	67.7	A	3706	69.5	A
F35	I-580 - WB	1st St	Portola Ave	Liv	2.56	East	4	2515	68.7	A	3706	70.2	A
F36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	1.73	East	4	3080	68.0	A	3706	69	A
F37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv - Uninc	1.73	East	4	3080	67.6	A	3706	68.9	A
F38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	1.23	East	4	3320	65.2	A	3706	65.9	A
F39	I-580 - WB	Tassajara Rd	I-680	Plea	2.78	East	4	2245	55.3	B	3447	55.4	B
F40	I-580 - WB	I-680	San Ramon Rd	Plea	0.71	East	4	2844	54.0	C	3586	57.2	B
F41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea - Uninc	4.82	East	4	2483	58.3	B	3706	59.2	B
F42	I-580 - WB	Eden Canyon	Center St	Uninc	2.5	East	4	3203	64.8	A	3706	63.5	A
F43	I-580 - WB	Center	I-580/238	Uninc	2.26	Central	5	3320	63.5	A	3704	57.8	B
F44	I-580 - EB	I-80	I-980	Oak	1.27	North	5	3197	19.2	(F20)	3706	19.5	(F20)
F45	I-580 - EB	I-980	Harrison	Oak	1.02	North	5	2962	16.0	(F20)	3706	15.7	(F20)
F46	I-580 - EB	Harrison	Lakeshore	Oak	0.84	North	4	3322	21.5	(F30)	3706	20.8	(F30)
F47	I-580 - EB	Lakeshore	Coolidge	Oak	2.21	North	5	2846	31.9	E	3466	30.5	E
F48	I-580 - EB	Coolidge	SH 13 Off	Oak	2.2	North	4	3228	29.7	(F30)	3706	31.7	E
F49	I-580 - EB	SH 13 Off	MacArthur	Oak	4.08	North	4	3432	51.3	C	3706	53.3	C
F50	I-580 - EB	MacArthur	I-580/238	San L - Uninc	3.78	Central	4	3101	65.3	A	3645	65.3	A
F51	I-580 - WB	I-238	Foothill/MacArthur	Uninc	3.86	Central	4	3112	65.3	A	3706	68.1	A
F52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak	4.04	North	4	3433	62.4	A	3585	64.5	A
F53	I-580 - WB	SH 13 Off	Fruitvale	Oak	2.63	North	4	3228	66.4	A	3571	68.6	A
F54	I-580 - WB	Fruitvale	Harrison	Oak	2.68	North	4	2609	63.4	A	3580	65.4	A
F55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1.24	North	5	2962	58.8	B	3585	58.6	B
F56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1.17	North	5	3197	23.8	(F30)	3706	24	(F30)
F57	I-580 - EB	Central (County Line)	I-80 Jct	Alb	0.7	North	2	3314	48.3	C	3699	51.4	C
F58	I-580 - WB	I-80 Jct	Central (County Line)	Alb	0.86	North	3	3345	56.0	C	3706	55	B
F59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	2.26	South	3	3410	35.3	E	3706	23.3	(F30)
F60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	1.62	South	3	3197	8.4	(F10)	3706	9	(F10)
F61	I-680 - NB	Durham Rd	Washington Blvd	Fre	1.3	South	3	2992	8.7	(F10)	3706	12.2	(F20)

Table B-1: 2018 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	1.14	South	3	3208	13.8	(F20)	3586	20.8	(F30)
F63	I-680 NB	SR 238/Mission	Vargas Rd	Fre	1.1	South	4	3559	16.7	(F20)	3706	22.2	(F30)
F64	I-680 NB	Vargas Rd	Andrade Rd	Uninc	2.21	South	4	3197	15.1	(F20)	3586	20.2	(F30)
F65	I-680 NB	Andrade Rd	Calaveras	Uninc	1.15	South	3	3077	25.2	(F30)	3586	33.9	E
F66	I-680 NB	Calaveras	Rt.84/Vallecitos	Uninc	0.39	South	3	3200	43.1	D	3706	50.9	C
F67	I-680 NB	SR 84	Sunol Blvd	Plea - Uninc	3.52	East	3	3200	66.9	A	3706	67.8	A
F68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea - Uninc	1.49	East	3	3320	65.1	A	3706	62	A
F69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	2.53	East	3	3320	60.1	A	3706	58.5	B
F70	I-680 NB	Stoneridge Dr	I-580	Plea	0.74	East	4	3200	60.6	A	3706	59.1	B
F71	I-680 - NB	I-580	Alcosta	Dub	1.85	East	4	2960	65.3	A	3586	66.1	A
F72	I-680 - SB	Alcosta	I-580	Dub	1.85	East	5	2960	66.8	A	3706	68.3	A
F73	I-680 SB	I-580	Stoneridge Dr	Plea	0.73	East	4	3200	64.7	A	3706	61.6	A
F74	I-680 SB	Stoneridge Dr	Bernal	Plea	2.54	East	3	3320	65.3	A	3466	63.9	A
F75	I-680 SB	Bernal Ave.	Sunol Blvd	Uninc	1.49	East	3	3318	65.9	A	3466	66.7	A
F76	I-680 SB	Sunol Blvd.	SR 84	Uninc	3.71	East	3	3074	66.8	A	3576	65.4	A
F77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Uninc	1.33	South	4	3074	66.5	A	3706	66.9	A
F78	I-680 SB	Andrade Rd	Sheridon Rd	Uninc	1.4	South	5	3200	63.0	A	3706	64.6	A
F79	I-680 SB	Sheridon Rd	Vargas Rd	Uninc	0.81	South	4	3318	64.8	A	3706	65.9	A
F80	I-680 SB	Vargas Rd	SR 238/Mission	Fre	1.11	South	4	3557	67.8	A	3706	69.7	A
F81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	1.14	South	4	3197	68.1	A	3706	70.2	A
F82	I-680 - SB	Washington Blvd	Durham Rd	Fre	1.35	South	4	2983	67.6	A	3706	69.3	A
F83	I-680 - SB	Durham Rd	Rt 262/Mission	Fre	1.63	South	4	3228	65.1	A	3706	66	A
F84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	2.25	South	4	3439	68.2	A	3706	70.5	A
F85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	2.09	South	6	3199	25.0	(F30)	3589	25.1	(F30)
F86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	2.43	South	4	3079	30.4	E	3590	32.2	E
F87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	1.53	South	4	3559	38.7	E	3706	45.1	D
F88	I-880 - NB	Stevenson	Decoto	Fre	4.06	South	4	2120	19.7	(F20)	3106	27	(F30)
F89	I-880 - NB	Decoto	Alvarado Blvd	Fre	1.17	South	4	3199	17.0	(F20)	3706	18.7	(F20)
F90	I-880 - NB	Alvarado Blvd	Alvarado-Niles Blvd	Fre- Uni Cty	1.57	South	4	2846	20.5	(F30)	3706	22.4	(F30)
F91	I-880 - NB	Alv-Niles	Tennyson	Uni Cty - Hay	2.6	South	4	2480	17.5	(F20)	3706	18.7	(F20)
F92	I-880 - NB	Tennyson	SR 92	Hay	1.02	Central	5	2720	25.1	(F30)	3665	25.7	(F30)
F93	I-880 - NB	SR 92	A St	Hay	1.68	Central	5	3077	30.9	E	3665	32.4	E
F94	I-880 - NB	A St	I-238 (Marina before 06)	Uninc	1.95	Central	5	3439	50.6	C	3706	55.9	B

Table B-1: 2018 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F95	I-880 - NB	I-880/I238 (split)	Marina Blvd	San L	2.54	Central	5	1796	57.2	B	1675	56.1	B
F96	I-880 - NB	Marina Blvd	SR 112/Davis	San L	0.82	Central	4	2150	41.3	D	1795	50.9	C
F97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - San L	1.83	Central	4	1670	48.2	D	1558	57.3	B
F98	I-880 - NB	Hegenberger	High/42nd	Oak	2.34	North	4	1913	32.8	E	1795	55.1	B
F99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1.25	North	4	1916	49.9	C	1795	53.7	C
F100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	2.63	North	4	1909	59.4	B	1795	57.8	B
F101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	2.43	North	4	3558	54.1	C	3700	59.4	B
F102	I-880 - NB	I-880/I-80 (split)	I-880/I-80 (merge)	Oak	1.44	North	4	3433	11.4	(F20)	3702	13.6	(F20)
F103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1.28	North	4	3439	50.2	C	3586	48.4	D
F104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	2.51	North	4	3199	21.1	(F30)	3706	22.3	(F30)
F105	I-880 - SB	I-980	23rd	Oak	2.74	North	5	1796	15.3	(F20)	1795	14.4	(F20)
F106	I-880 - SB	23rd St	High/42nd	Oak	1.1	North	5	1916	30.2	E	1675	31.7	E
F107	I-880 - SB	High/42nd	Hegenberger	Oak	2.36	North	4	1913	37.1	E	1675	37.5	E
F108	I-880 - SB	Hegenberger	SR 112/Davis	Oak - San L	1.82	North	4	1670	49.5	C	1795	55.7	B
F109	I-880 - SB	SR 112/Davis	Marina Blvd	San L	0.82	North	4	2150	47.8	D	1795	51.6	C
F110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak - San L	2.55	North	4	1796	48.9	D	1795	51.8	C
F111	I-880 - SB	I-238 (Marina before 06)	A St	Uninc	1.91	Central	5	3439	38.6	E	3586	39.2	E
F112	I-880 - SB	A St	Rt 92	Hay	1.7	Central	5	3199	39.4	E	3706	41.5	D
F113	I-880 - SB	Rt 92	Tennyson	Hay	1.01	Central	5	2720	36.4	E	3706	40	E
F114	I-880 - SB	Tennyson	Alv-Niles	Hay - Uni Cty	2.6	Central	4	2480	45.4	D	3347	44.1	D
F115	I-880 - SB	Alvarado-Niles	Alvarado	Uni Cty - Fre	1.56	South	4	2846	57.4	B	3706	56.4	B
F116	I-880 - SB	Alvarado	Decoto	Fre	1.19	South	4	3079	53.7	C	3706	54.2	C
F117	I-880 - SB	Decoto	Stevenson	Fre	4.06	South	4	2000	56.6	B	3346	53.4	C
F118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	1.52	Central	4	3559	62.6	A	3706	62.6	A
F119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2.83	Central	4	3079	65.3	A	3586	64.1	A
F120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	1.69	South	4	3199	67.1	A	3706	66.4	A
F121	I-980 - WB	SR 24 @ 580	I-880	Oak	2.49	North	4	1791	61.2	A	1791	58.9	B
F122	I-980 - EB	I-880	SR 24 @ 580	Oak	2.44	North	4	1911	43.3	D	1795	55.5	B
F123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1.27	North	2	3337	60.9	A	3690	55.5	B
F124	SR 13 - NB	Carson/Redwood (1) (off)	Joaquin Miller	Oak	1.08	North	2	3365	62.4	A	3691	61.7	A
F125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1.83	North	2	3402	35.0	E	3694	44.2	D
F126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1.63	North	2	1983	17.5	(F20)	2973	22.6	(F30)
F127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1.6	North	2	2222	41.5	D	3354	36.3	E

Table B-1: 2018 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1.85	North	2	3328	53.7	C	3688	49	C
F129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1.07	North	2	3427	58.9	B	3686	50	C
F130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1.4	North	2	3330	14.8	(F20)	3561	13.7	(F20)
F131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1.84	North	4	3439	13.0	(F20)	3706	20.2	(F30)
F132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1.65	North	4	3325	11.1	(F20)	3706	12.9	(F20)
F133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1.04	North	4	2770	25.1	(F30)	3586	26.8	(F30)
F134	SR 24 - WB	Fish Ranch Road (CC)	Caldecott (exit)	Oak	0.99	North	4	2209	57.9	B	3705	59.4	B
F135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1.73	North	4	2483	61.5	A	3705	61.5	A
F136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1.86	North	4	3439	63.5	A	3687	66	A
F137	SR 84 - EB	San M CL	Toll Plaza	Fre	3.29	South	3	3559	48.2	D	3706	50.3	C
F138	SR 84 - EB	Toll Plaza	Thornton	Fre	0.54	South	3	3559	53.5	C	3706	57.7	B
F139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	New	1.16	South	3	3559	46.9	D	3706	49.3	C
F140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	New	1.2	South	2	3557	16.5	(F20)	3706	15.6	(F20)
F141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	1.21	South	3	3413	47.1	D	3605	48.1	D
F142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	1.15	South	3	3079	64.1	A	3553	65.4	A
F143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	0.54	South	3	3377	53.0	C	3599	54.1	C
F144	SR 84 - WB	Toll Plaza	San M CL	Fre	3.29	Central	3	3559	61.9	A	3681	68.2	A
F145	SR 92 - EB	San M CL	Toll Plaza	Hay	2.78	Central	3	3438	39.2	E	1311	40.6	E
F146	SR 92 - EB	Toll Plaza	Clawiter	Hay	1.87	Central	3	3437	38.6	E	3703	37.5	E
F147	SR 92 - EB	Clawiter	I-880	Hay	2.07	Central	4	3064	30.7	E	3567	36.2	E
F148	SR 92 - WB	I-880	Clawiter	Hay	2.05	Central	4	2776	61.0	A	3608	62.3	A
F149	SR 92 - WB	Clawiter	Toll Plaza	Hay	1.88	Central	4	3439	58.6	B	3706	58.5	B
F150	SR 92 - WB	Toll Plaza	San M CL	Hay	2.79	Central	3	3439	65.5	A	1311	67.6	A

B.2 | Freeways (Tier 1) - AM Peak Period (INRIX data)

Table B-2: 2018 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F1	I-80 - EB	SF County Line	Toll Plaza	Oak	2.01	North	5	2795	62.2	A	3706	61.6	A
F2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1.3	North	6	1889	63.2	A	3706	64.1	A
F3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery	0.54	North	6	3070	58.7	B	3706	58.7	B

Table B-2: 2018 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F4	I-80 - EB	Powell	Ashby	Emery - Berk	0.72	North	6	3386	61.4	A	3706	60.2	A
F5	I-80 - EB	Ashby	University	Berk	1.3	North	5	3504	62.9	A	3706	60.9	A
F6	I-80 - EB	University	Jct I-580 (off)	Berk - Alb	1.37	North	5	2962	63.5	A	3586	61	A
F7	I-80 - EB	Jct I-580 (off)	Central (County Line)	Alb	0.84	North	4	3305	65.3	A	3706	64.7	A
F8	I-80 - WB	Central (County Line)	Jct I-580	Alb	0.7	North	4	3305	17.1	(F20)	3706	20.5	(F30)
F9	I-80 - WB	Jct I-580	University	Berk - Alb	1.51	North	6	2962	19.7	(F20)	3349	22.3	(F30)
F10	I-80 - WB	University	Ashby	Berk	1.31	North	5	3504	26.7	(F30)	3587	29.9	(F30)
F11	I-80 - WB	Ashby	Powell	Emery	0.71	North	5	3386	26.9	(F30)	3706	29.8	(F30)
F12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery	0.47	North	6	3270	21.0	(F30)	3692	24.6	(F30)
F13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1.31	North	8	2088	7.6	(F10)	3692	10.5	(F20)
F14	I-80 - WB	Toll Plaza	SF County	Oak	2.01	North	4	2677	24.2	(F30)	3706	39.7	E
F15	I-238 - EB	I-880	I-580	Uninc-San L	2.59	Central	3	3040	47.4	D	3706	43.3	D
F16	I-238 - WB	I-580	I-880	Uninc-San L	2.48	Central	3	2920	21.4	(F30)	3586	19.6	(F20)
F17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Uninc	2.68	Central	5	3149	37.4	E	3706	34.4	E
F18	I-580 EB	Grove	Eden Canyon	Uninc - Plea	2.19	East	4	3156	46.0	D	3706	44.9	D
F19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc - Plea	4.82	East	4	2910	57.7	B	3706	58.7	B
F20	I-580 EB	San Ramon/ Foothill	I-680	Plea	0.71	East	4	2789	62.6	A	3706	64.9	A
F21	I-580 EB	I-680	Hopyard	Plea	0.87	East	6	2666	65.3	A	3706	66.3	A
F22	I-580 EB	Hopyard	Santa Rita	Plea	1.9	East	6	2428	65.6	A	3706	67.5	A
F23	I-580 EB	Santa Rita	El Charro	Uninc-Pleas	1.25	East	6	3020	66.2	A	3706	68.8	A
F24	I-580 EB	El Charro	SR 84/Airway Blvd.	Uninc	1.72	East	6	2906	66.1	A	3586	68.2	A
F25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	1.73	East	5	3021	66.4	A	3706	68.7	A
F26	I-580 - EB	Portola	1st St	Liv	2.56	East	5	3140	66.5	A	3706	69.1	A
F27	I-580 - EB	1st St	Greenville	Liv	2.13	East	6	3028	66.3	A	3586	67.9	A
F28	I-580 - EB	Greenville	N.Flynn	Uninc	2.73	East	4	2786	64.2	A	3587	67.2	A
F29	I-580 - EB	N.Flynn	Grant Line	Uninc	4.32	East	4	2795	67.7	A	3706	69.2	A
F30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	0.87	East	5	3199	66.2	A	3635	66.8	A
F31	I-580 - WB	I-205 (SJ Co)	Grant Line	Uninc	0.72	East	5	3367	26.7	(F30)	3706	19.2	(F20)
F32	I-580 - WB	Grant Line	N Flynn	Uninc	4.59	East	4	2563	34.8	E	3706	33.8	E
F33	I-580 - WB	N Flynn	Greenville Rd	Liv - Uninc	2.43	East	5	2908	53.5	C	3586	54.1	C
F34	I-580 - WB	Greenville Rd	1st St	Liv	2.21	East	4	3147	64.0	A	3347	61.8	A
F35	I-580 - WB	1st St	Portola Ave	Liv	2.56	East	4	3259	60.0	A	3706	57.4	B

Table B-2: 2018 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	1.73	East	4	3140	54.6	C	3586	48.4	D
F37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv - Uninc	1.73	East	4	2906	47.5	D	3706	49.2	C
F38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	1.23	East	4	3020	43.9	D	3706	47.9	D
F39	I-580 - WB	Tassajara Rd	I-680	Plea	2.78	East	4	2192	50.2	C	3467	48.4	D
F40	I-580 - WB	I-680	San Ramon Rd	Plea	0.71	East	4	2908	63.6	A	3706	61.3	A
F41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea - Uninc	4.82	East	4	3029	63.7	A	3706	60.2	A
F42	I-580 - WB	Eden Canyon	Center St	Uninc	2.5	East	4	3275	62.7	A	3706	57.5	B
F43	I-580 - WB	Center	I-580/238	Uninc	2.26	Central	5	3267	53.4	C	3706	49.6	C
F44	I-580 - EB	I-80	I-980	Oak	1.27	North	5	3384	57.5	B	3706	57.8	B
F45	I-580 - EB	I-980	Harrison	Oak	1.02	North	5	3136	64.8	A	3703	65.4	A
F46	I-580 - EB	Harrison	Lakeshore	Oak	0.84	North	4	3382	66.8	A	3702	66.6	A
F47	I-580 - EB	Lakeshore	Coolidge	Oak	2.21	North	5	3265	66.2	A	3702	66.7	A
F48	I-580 - EB	Coolidge	SH 13 Off	Oak	2.2	North	4	3363	67.5	A	3705	67.9	A
F49	I-580 - EB	SH 13 Off	MacArthur	Oak	4.08	North	4	2558	68.6	A	3706	68.2	A
F50	I-580 - EB	MacArthur	I-580/238	San L - Uninc	3.78	Central	4	3033	66.2	A	3699	67.8	A
F51	I-580 - WB	I-238	Foothill/MacArthur	Uninc	3.86	Central	4	3030	43.9	D	3706	49.5	C
F52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak	4.04	North	4	2562	27.7	(F30)	3706	27.7	(F30)
F53	I-580 - WB	SH 13 Off	Fruitvale	Oak	2.63	North	4	3384	23.9	(F30)	3586	21.9	(F30)
F54	I-580 - WB	Fruitvale	Harrison	Oak	2.68	North	4	3149	45.5	D	3347	42.5	D
F55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1.24	North	5	3156	49.4	C	3467	53.3	C
F56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1.17	North	5	3069	24.6	(F30)	3706	33.2	E
F57	I-580 - EB	Central (County Line)	I-80 Jct	Alb	0.7	North	2	3305	23.1	(F30)	3706	24.7	(F30)
F58	I-580 - WB	I-80 Jct	Central (County Line)	Alb	0.86	North	3	3304	60.8	A	3706	59.6	B
F59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	2.26	South	3	3484	63.9	A	3706	61.7	A
F60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	1.62	South	3	3245	66.3	A	3706	65.2	A
F61	I-680 - NB	Durham Rd	Washington Blvd	Fre	1.3	South	3	3273	65.8	A	3706	61.8	A
F62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	1.14	South	3	3152	63.8	A	3706	60.9	A
F63	I-680 NB	SR 238/Mission	Vargas Rd	Fre	1.1	South	4	3504	63.5	A	3706	61	A
F64	I-680 NB	Vargas Rd	Andrade Rd	Uninc	2.21	South	4	2905	65.9	A	3351	65.3	A
F65	I-680 NB	Andrade Rd	Calaveras	Uninc	1.15	South	3	3140	65.9	A	3706	65.1	A
F66	I-680 NB	Calaveras	Rt.84/Vallecitos	Uninc	0.39	South	3	3026	64.9	A	3706	64.3	A
F67	I-680 NB	SR 84	Sunol Blvd	Plea - Uninc	3.52	East	3	3024	67.5	A	3706	57.3	B
F68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea - Uninc	1.49	East	3	3143	67.1	A	3587	45.6	D

Table B-2: 2018 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	2.53	East	3	3023	63.6	A	3706	66	A
F70	I-680 NB	Stoneridge Dr	I-580	Plea	0.74	East	4	2904	42.7	D	3586	58.6	B
F71	I-680 - NB	I-580	Alcosta	Dub	1.85	East	4	2912	37.3	E	3587	51.2	C
F72	I-680 - SB	Alcosta	I-580	Dub	1.85	East	5	2912	62.7	A	3706	56.1	B
F73	I-680 SB	I-580	Stoneridge Dr	Plea	0.73	East	4	2904	39.9	E	3586	30.2	E
F74	I-680 SB	Stoneridge Dr	Bernal	Plea	2.54	East	3	3023	31.0	E	3586	26.2	(F30)
F75	I-680 SB	Bernal Ave.	Sunol Blvd	Uninc	1.49	East	3	3143	30.6	E	3587	28.4	(F30)
F76	I-680 SB	Sunol Blvd.	SR 84	Uninc	3.71	East	3	3024	44.4	D	3700	43.3	D
F77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Uninc	1.33	South	4	3026	56.4	B	3706	56.7	B
F78	I-680 SB	Andrade Rd	Sheridon Rd	Uninc	1.4	South	5	3259	56.7	B	3706	56.1	B
F79	I-680 SB	Sheridon Rd	Vargas Rd	Uninc	0.81	South	4	2905	58.9	B	3706	58.2	B
F80	I-680 SB	Vargas Rd	SR 238/Mission	Fre	1.11	South	4	3504	62.4	A	3706	60.3	A
F81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	1.14	South	4	3152	60.5	A	3586	58.7	B
F82	I-680 - SB	Washington Blvd	Durham Rd	Fre	1.35	South	4	3273	48.3	D	3469	47.9	D
F83	I-680 - SB	Durham Rd	Rt 262/Mission	Fre	1.63	South	4	3265	45.7	D	3706	53.3	C
F84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	2.25	South	4	3504	66.2	A	3706	67.5	A
F85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	2.09	South	6	3504	67.5	A	3706	68.5	A
F86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	2.43	South	4	3384	65.3	A	3586	66	A
F87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	1.53	South	4	3504	64.4	A	3706	65.4	A
F88	I-880 - NB	Stevenson	Decoto	Fre	4.06	South	4	2444	63.8	A	3587	62.5	A
F89	I-880 - NB	Decoto	Alvarado Blvd	Fre	1.17	South	4	2795	60.5	A	3587	63.1	A
F90	I-880 - NB	Alvarado Blvd	Alvarado-Niles Blvd	Fre- Uni Cty	1.57	South	4	3028	58.6	B	3586	49.2	C
F91	I-880 - NB	Alv-Niles	Tennyson	Uni Cty - Hay	2.6	South	4	2672	43.5	D	3229	46	D
F92	I-880 - NB	Tennyson	SR 92	Hay	1.02	Central	5	2919	47.2	D	3706	49.4	C
F93	I-880 - NB	SR 92	A St	Hay	1.68	Central	5	2680	45.8	D	3706	46.9	D
F94	I-880 - NB	A St	I-238 (Marina before 06)	Uninc	1.95	Central	5	2911	38.8	E	3587	38.3	E
F95	I-880 - NB	I-880/I238 (split)	Marina Blvd	San L	2.54	Central	5	3182	23.2	(F30)	3468	23.2	(F30)
F96	I-880 - NB	Marina Blvd	SR 112/Davis	San L	0.82	Central	4	3388	22.8	(F30)	3706	23.9	(F30)
F97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - San L	1.83	Central	4	3273	24.4	(F30)	3706	24.5	(F30)
F98	I-880 - NB	Hegenberger	High/42nd	Oak	2.34	North	4	3145	19.7	(F20)	3466	19.1	(F20)
F99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1.25	North	4	3384	24.9	(F30)	3706	23.2	(F30)
F100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	2.63	North	4	3149	48.1	D	3706	46.4	D
F101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	2.43	North	4	3268	63.4	A	3706	62.2	A

Table B-2: 2018 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F102	I-880 - NB	I-880/I-80 (split)	I-880/I-80 (merge)	Oak	1.44	North	4	2953	60.3	A	3706	59	B
F103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1.28	North	4	3069	56.8	B	3706	55.8	B
F104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	2.51	North	4	3033	65.3	A	3706	63.3	A
F105	I-880 - SB	I-980	23rd	Oak	2.74	North	5	2909	55.3	B	3706	42.3	D
F106	I-880 - SB	23rd St	High/42nd	Oak	1.1	North	5	3384	54.1	C	3586	53.5	C
F107	I-880 - SB	High/42nd	Hegenberger	Oak	2.36	North	4	3145	62.2	A	3706	61.8	A
F108	I-880 - SB	Hegenberger	SR 112/Davis	Oak - San L	1.82	North	4	3273	63.9	A	3706	65.2	A
F109	I-880 - SB	SR 112/Davis	Marina Blvd	San L	0.82	North	4	3388	60.8	A	3706	64.7	A
F110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak - San L	2.55	North	4	3182	45.4	D	3586	56.6	B
F111	I-880 - SB	I-238 (Marina before 06)	A St	Uninc	1.91	Central	5	2911	25.0	(F30)	3346	30	E
F112	I-880 - SB	A St	Rt 92	Hay	1.7	Central	5	2680	25.5	(F30)	3706	31	E
F113	I-880 - SB	Rt 92	Tennyson	Hay	1.01	Central	5	2919	23.4	(F30)	3467	24.5	(F30)
F114	I-880 - SB	Tennyson	Alv-Niles	Hay - Uni Cty	2.6	Central	4	2672	22.9	(F30)	3228	22	(F30)
F115	I-880 - SB	Alvarado-Niles	Alvarado	Uni Cty - Fre	1.56	Central	4	3028	25.2	(F30)	3706	22.4	(F30)
F116	I-880 - SB	Alvarado	Decoto	Fre	1.19	Central	4	2911	28.6	(F30)	3706	25.2	(F30)
F117	I-880 - SB	Decoto	Stevenson	Fre	4.06	South	4	2560	30.3	E	3466	25.8	(F30)
F118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	1.52	Central	4	3504	43.6	D	3706	42	D
F119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2.83	Central	4	3384	47.5	D	3466	46.7	D
F120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	1.69	South	4	3504	46.1	D	3706	41.7	D
F121	I-980 - WB	SR 24 @ 580	I-880	Oak	2.49	North	4	2681	59.9	B	3706	63.7	A
F122	I-980 - EB	I-880	SR 24 @ 580	Oak	2.44	North	4	3036	62.0	A	3705	62	A
F123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1.27	North	2	3403	39.2	E	3668	31.6	E
F124	SR 13 - NB	Carson/Redwood (1) (off)	Joaquin Miller	Oak	1.08	North	2	3444	30.0	E	3677	24.3	(F30)
F125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1.83	North	2	3359	31.9	E	3674	31	E
F126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1.63	North	2	2402	33.9	E	2901	36	E
F127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1.6	North	2	933	53.7	C	1999	55.9	B
F128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1.85	North	2	3008	62.9	A	3656	64.2	A
F129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1.07	North	2	3117	66.0	A	3690	67	A
F130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1.4	North	2	3066	57.4	B	3674	54.2	C
F131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1.84	North	4	3388	64.3	A	3702	66.1	A
F132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1.65	North	4	3384	58.8	B	3704	61.1	A
F133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1.04	North	4	2683	53.0	C	3464	50.9	C
F134	SR 24 - WB	Fish Ranch Road (CC)	Caldecott (exit)	Oak	0.99	North	4	3362	55.0	B	3706	55	B

Table B-2: 2018 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1.73	North	4	3362	60.2	A	3706	58.7	B
F136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1.86	North	4	3504	53.3	C	3706	52.8	C
F137	SR 84 - EB	San M CL	Toll Plaza	Fre	3.29	South	3	3385	65.4	A	3689	66.7	A
F138	SR 84 - EB	Toll Plaza	Thornton	Fre	0.54	South	3	3378	67.1	A	3647	64.3	A
F139	SR 84 - EB	Thornton/Pascon Padre	Newark/Ardenwood Blvd	New	1.16	South	3	3165	64.4	A	3634	64.4	A
F140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	New	1.2	South	2	3119	49.6	C	3628	48.7	D
F141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	1.21	South	3	3386	37.2	E	3706	42.5	D
F142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	1.15	South	3	3384	29.0	(F30)	3706	40.9	E
F143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	0.54	South	3	3386	22.3	(F30)	3706	23.9	(F30)
F144	SR 84 - WB	Toll Plaza	San M CL	Fre	3.29	Central	3	3386	32.2	E	3706	29.2	(F30)
F145	SR 92 - EB	San M CL	Toll Plaza	Hay	2.78	Central	3	3271	67.2	A	1313	69	A
F146	SR 92 - EB	Toll Plaza	Clawiter	Hay	1.87	Central	3	3009	67.1	A	3704	67.9	A
F147	SR 92 - EB	Clawiter	I-880	Hay	2.07	Central	4	1737	58.7	B	2803	59.8	B
F148	SR 92 - WB	I-880	Clawiter	Hay	2.05	Central	4	2916	21.6	(F30)	3706	32.2	E
F149	SR 92 - WB	Clawiter	Toll Plaza	Hay	1.88	Central	4	3038	20.2	(F30)	3706	21.5	(F30)
F150	SR 92 - WB	Toll Plaza	San M CL	Hay	2.79	Central	3	3274	39.9	E	1313	36.5	E

B.3 | Freeways (Tier 1) - Weekend Midday Peak Period (INRIX data)

Table B-3: 2018 LOS Monitoring Results for Freeways (Tier 1) – Weekday Midday Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F1	I-80 - EB	SF County Line	Toll Plaza	Oak	2.01	North	5	2397	58.1	B	2370	51.9	C
F2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1.3	North	6	2387	41.6	D	2368	57.6	B
F3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery	0.54	North	6	2397	21.2	(F30)	2370	22.9	(F30)
F4	I-80 - EB	Powell	Ashby	Emery - Berk	0.72	North	6	2397	21.5	(F30)	2370	22.1	(F30)
F5	I-80 - EB	Ashby	University	Berk	1.3	North	5	2397	37.6	E	2370	36.5	E
F6	I-80 - EB	University	Jct I-580 (off)	Berk - Alb	1.37	North	5	2397	57.5	B	2370	54.3	C
F7	I-80 - EB	Jct I-580 (off)	Central (County Line)	Alb	0.84	North	4	2393	63.5	A	2370	63.5	A
F8	I-80 - WB	Central (County Line)	Jct I-580	Alb	0.7	North	4	2397	25.7	(F30)	2370	33.1	E
F9	I-80 - WB	Jct I-580	University	Berk - Alb	1.51	North	6	2397	21.1	(F30)	2370	21.7	(F30)
F10	I-80 - WB	University	Ashby	Berk	1.31	North	5	2397	24.6	(F30)	2370	26	(F30)

Table B-3: 2018 LOS Monitoring Results for Freeways (Tier 1) – Weekday Midday Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F11	I-80 - WB	Ashby	Powell	Emery	0.71	North	5	2397	22.6	(F30)	2370	25.6	(F30)
F12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery	0.47	North	6	2397	28.1	(F30)	2370	25.2	(F30)
F13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1.31	North	8	2393	14.3	(F20)	2370	13.4	(F20)
F14	I-80 - WB	Toll Plaza	SF County	Oak	2.01	North	4	2397	27.9	(F30)	2370	32.9	E
F15	I-238 - EB	I-880	I-580	Uninc-San L	2.59	Central	3	2395	57.7	B	2370	54.5	C
F16	I-238 - WB	I-580	I-880	Uninc-San L	2.48	Central	3	2328	41.4	D	2294	40.6	E
F17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Uninc	2.68	Central	5	2389	56.8	B	2370	59.2	B
F18	I-580 EB	Grove	Eden Canyon	Uninc - Plea	2.19	East	4	2397	54.5	C	2370	50.7	C
F19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc - Plea	4.82	East	4	2397	63.6	A	2370	63	A
F20	I-580 EB	San Ramon/ Foothill	I-680	Plea	0.71	East	4	2397	67.0	A	2370	64.7	A
F21	I-580 EB	I-680	Hopyard	Plea	0.87	East	6	2397	66.8	A	2370	62.9	A
F22	I-580 EB	Hopyard	Santa Rita	Plea	1.9	East	6	2397	65.9	A	2370	62.4	A
F23	I-580 EB	Santa Rita	El Charro	Uninc-Pleas	1.25	East	6	2397	67.4	A	2370	65.8	A
F24	I-580 EB	El Charro	SR 84/Airway Blvd.	Uninc	1.72	East	6	2397	68.8	A	2370	68.2	A
F25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	1.73	East	5	2397	68.0	A	2370	64.8	A
F26	I-580 - EB	Portola	1st St	Liv	2.56	East	5	2397	69.8	A	2370	69	A
F27	I-580 - EB	1st St	Greenville	Liv	2.13	East	6	2397	56.0	B	2370	68.6	A
F28	I-580 - EB	Greenville	N.Flynn	Uninc	2.73	East	4	2397	46.6	D	2370	61.7	A
F29	I-580 - EB	N.Flynn	Grant Line	Uninc	4.32	East	4	2397	64.2	A	2370	66.6	A
F30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	0.87	East	5	2159	65.4	A	2301	67.4	A
F31	I-580 - WB	I-205 (SJ Co)	Grant Line	Uninc	0.72	East	5	1860	65.0	A	2126	68.5	A
F32	I-580 - WB	Grant Line	N Flynn	Uninc	4.59	East	4	2397	58.3	B	2370	65	A
F33	I-580 - WB	N Flynn	Greenville Rd	Liv - Uninc	2.43	East	5	2397	68.6	A	2370	68.4	A
F34	I-580 - WB	Greenville Rd	1st St	Liv	2.21	East	4	2393	63.7	A	2370	70.7	A
F35	I-580 - WB	1st St	Portola Ave	Liv	2.56	East	4	2397	54.1	C	2370	70.6	A
F36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	1.73	East	4	2397	67.4	A	2370	69.2	A
F37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv - Uninc	1.73	East	4	2397	67.3	A	2370	67.9	A
F38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	1.23	East	4	2397	59.4	B	2370	55	B
F39	I-580 - WB	Tassajara Rd	I-680	Plea	2.78	East	4	2397	48.2	D	2343	34.5	E
F40	I-580 - WB	I-680	San Ramon Rd	Plea	0.71	East	4	2397	65.0	A	2370	63.9	A
F41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea - Uninc	4.82	East	4	2397	68.1	A	2370	66.1	A
F42	I-580 - WB	Eden Canyon	Center St	Uninc	2.5	East	4	2397	68.7	A	2370	69.7	A

Table B-3: 2018 LOS Monitoring Results for Freeways (Tier 1) – Weekday Midday Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F43	I-580 - WB	Center	I-580/238	Uninc	2.26	Central	5	2363	66.2	A	2359	65.1	A
F44	I-580 - EB	I-80	I-980	Oak	1.27	North	5	2396	54.7	C	2370	54.2	C
F45	I-580 - EB	I-980	Harrison	Oak	1.02	North	5	2397	61.3	A	2370	63.9	A
F46	I-580 - EB	Harrison	Lakeshore	Oak	0.84	North	4	2395	62.8	A	2370	65	A
F47	I-580 - EB	Lakeshore	Coolidge	Oak	2.21	North	5	2393	63.2	A	2370	65.8	A
F48	I-580 - EB	Coolidge	SH 13 Off	Oak	2.2	North	4	2370	66.1	A	2370	66.7	A
F49	I-580 - EB	SH 13 Off	MacArthur	Oak	4.08	North	4	2383	67.0	A	2370	66.7	A
F50	I-580 - EB	MacArthur	I-580/238	San L - Uninc	3.78	Central	4	2386	65.3	A	2318	66.1	A
F51	I-580 - WB	I-238	Foothill/MacArthur	Uninc	3.86	Central	4	2371	68.1	A	2366	67.5	A
F52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak	4.04	North	4	2350	66.5	A	2359	66.1	A
F53	I-580 - WB	SH 13 Off	Fruitvale	Oak	2.63	North	4	2369	64.2	A	2351	67.4	A
F54	I-580 - WB	Fruitvale	Harrison	Oak	2.68	North	4	2387	62.1	A	2367	63.2	A
F55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1.24	North	5	2397	48.1	D	2370	51	C
F56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1.17	North	5	2397	25.1	(F30)	2370	26.5	(F30)
F57	I-580 - EB	Central (County Line)	I-80 Jct	Alb	0.7	North	2	2384	37.8	E	2369	37.7	E
F58	I-580 - WB	I-80 Jct	Central (County Line)	Alb	0.86	North	3	2344	58.8	B	2369	58.5	B
F59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	2.26	South	3	2393	59.1	B	2370	62.2	A
F60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	1.62	South	3	2393	41.7	D	2370	32.9	E
F61	I-680 - NB	Durham Rd	Washington Blvd	Fre	1.3	South	3	2397	37.4	E	2370	27.5	(F30)
F62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	1.14	South	3	2396	47.2	D	2370	37.9	E
F63	I-680 NB	SR 238/Mission	Vargas Rd	Fre	1.1	South	4	2397	61.7	A	2370	58	B
F64	I-680 NB	Vargas Rd	Andrade Rd	Uninc	2.21	South	4	2397	66.2	A	2370	56.6	B
F65	I-680 NB	Andrade Rd	Calaveras	Uninc	1.15	South	3	2397	64.4	A	2370	57.7	B
F66	I-680 NB	Calaveras	Rt.84/Vallecitos	Uninc	0.39	South	3	2397	63.5	A	2370	61.5	A
F67	I-680 NB	SR 84	Sunol Blvd	Plea - Uninc	3.52	East	3	2389	63.7	A	2370	65.7	A
F68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea - Uninc	1.49	East	3	2394	55.6	B	2370	54	C
F69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	2.53	East	3	2394	61.3	A	2370	55.2	B
F70	I-680 NB	Stoneridge Dr	I-580	Plea	0.74	East	4	2394	63.7	A	2370	63.5	A
F71	I-680 - NB	I-580	Alcosta	Dub	1.85	East	4	2397	66.8	A	2370	67.8	A
F72	I-680 - SB	Alcosta	I-580	Dub	1.85	East	5	2397	69.1	A	2367	70.3	A
F73	I-680 SB	I-580	Stoneridge Dr	Plea	0.73	East	4	2397	65.1	A	2367	63.2	A
F74	I-680 SB	Stoneridge Dr	Bernal	Plea	2.54	East	3	2392	66.5	A	2370	64.7	A
F75	I-680 SB	Bernal Ave.	Sunol Blvd	Uninc	1.49	East	3	2392	66.2	A	2370	65.4	A

Table B-3: 2018 LOS Monitoring Results for Freeways (Tier 1) – Weekday Midday Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F76	I-680 SB	Sunol Blvd.	SR 84	Uninc	3.71	East	3	2397	67.7	A	2199	66.9	A
F77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Uninc	1.33	South	4	2397	67.3	A	2370	69.1	A
F78	I-680 SB	Andrade Rd	Sheridon Rd	Uninc	1.4	South	5	2397	64.0	A	2370	66.1	A
F79	I-680 SB	Sheridon Rd	Vargas Rd	Uninc	0.81	South	4	2397	65.8	A	2370	67.8	A
F80	I-680 SB	Vargas Rd	SR 238/Mission	Fre	1.11	South	4	2397	68.5	A	2370	71	A
F81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	1.14	South	4	2397	68.9	A	2370	70.8	A
F82	I-680 - SB	Washington Blvd	Durham Rd	Fre	1.35	South	4	2397	67.9	A	2370	68.6	A
F83	I-680 - SB	Durham Rd	Rt 262/Mission	Fre	1.63	South	4	2376	54.9	C	2370	58.6	B
F84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	2.25	South	4	2374	68.7	A	2370	71.5	A
F85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	2.09	South	6	2394	67.8	A	2370	67.4	A
F86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	2.43	South	4	2393	64.8	A	2370	63.4	A
F87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	1.53	South	4	2397	62.4	A	2370	60.5	A
F88	I-880 - NB	Stevenson	Decoto	Fre	4.06	South	4	2397	63.3	A	2370	60.2	A
F89	I-880 - NB	Decoto	Alvarado Blvd	Fre	1.17	South	4	2397	52.9	C	2370	51.8	C
F90	I-880 - NB	Alvarado Blvd	Alvarado-Niles Blvd	Fre- Uni Cty	1.57	South	4	2397	48.6	D	2370	51.8	C
F91	I-880 - NB	Alv-Niles	Tennyson	Uni Cty - Hay	2.6	South	4	2397	40.5	E	2370	39	E
F92	I-880 - NB	Tennyson	SR 92	Hay	1.02	Central	5	2397	47.4	D	2370	38.1	E
F93	I-880 - NB	SR 92	A St	Hay	1.68	Central	5	2397	45.7	D	2370	41.6	D
F94	I-880 - NB	A St	I-238 (Marina before 06)	Uninc	1.95	Central	5	2397	53.2	C	2370	54.5	C
F95	I-880 - NB	I-880/I238 (split)	Marina Blvd	San L	2.54	Central	5	2397	60.4	A	2370	65.2	A
F96	I-880 - NB	Marina Blvd	SR 112/Davis	San L	0.82	Central	4	2397	55.9	B	2370	62.3	A
F97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - San L	1.83	Central	4	2397	55.7	B	2370	59.2	B
F98	I-880 - NB	Hegenberger	High/42nd	Oak	2.34	North	4	2397	53.8	C	2370	38.2	E
F99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1.25	North	4	2397	57.5	B	2370	41.1	D
F100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	2.63	North	4	2394	59.4	B	2370	54.6	C
F101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	2.43	North	4	2385	61.7	A	2365	64.7	A
F102	I-880 - NB	I-880/I-80 (split)	I-880/I-80 (merge)	Oak	1.44	North	4	2386	38.6	E	2367	45.8	D
F103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1.28	North	4	2397	55.8	B	2370	56.5	B
F104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	2.51	North	4	2395	64.9	A	2370	67.4	A
F105	I-880 - SB	I-980	23rd	Oak	2.74	North	5	2397	54.2	C	2370	49.4	C
F106	I-880 - SB	23rd St	High/42nd	Oak	1.1	North	5	2397	46.4	D	2370	48.6	D
F107	I-880 - SB	High/42nd	Hegenberger	Oak	2.36	North	4	2397	47.1	D	2370	52.8	C
F108	I-880 - SB	Hegenberger	SR 112/Davis	Oak - San L	1.82	North	4	2397	62.9	A	2370	62.9	A

Table B-3: 2018 LOS Monitoring Results for Freeways (Tier 1) – Weekday Midday Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F109	I-880 - SB	SR 112/Davis	Marina Blvd	San L	0.82	North	4	2397	63.0	A	2370	66.7	A
F110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak - San L	2.55	North	4	2397	59.7	B	2370	63.4	A
F111	I-880 - SB	I-238 (Marina before 06)	A St	Uninc	1.91	Central	5	2397	37.9	E	2370	39.1	E
F112	I-880 - SB	A St	Rt 92	Hay	1.7	Central	5	2397	46.2	D	2370	48.3	D
F113	I-880 - SB	Rt 92	Tennyson	Hay	1.01	Central	5	2397	45.7	D	2370	49.6	C
F114	I-880 - SB	Tennyson	Alv-Niles	Hay - Uni Cty	2.6	Central	4	2397	49.5	C	2370	47.9	D
F115	I-880 - SB	Alvarado-Niles	Alvarado	Uni Cty - Fre	1.56	Central	4	2397	51.7	C	2370	46.5	D
F116	I-880 - SB	Alvarado	Decoto	Fre	1.19	Central	4	2397	42.5	D	2370	38.8	E
F117	I-880 - SB	Decoto	Stevenson	Fre	4.06	South	4	2397	44.7	D	2370	44.9	D
F118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	1.52	Central	4	2397	61.1	A	2370	59	B
F119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2.83	Central	4	2396	65.5	A	2370	65.8	A
F120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	1.69	South	4	2397	66.9	A	2370	67.1	A
F121	I-980 - WB	SR 24 @ 580	I-880	Oak	2.49	North	4	2338	63.6	A	2368	66.9	A
F122	I-980 - EB	I-880	SR 24 @ 580	Oak	2.44	North	4	2350	60.9	A	2347	63.8	A
F123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1.27	North	2	1849	60.6	A	2300	62.2	A
F124	SR 13 - NB	Carson/Redwood (1) (off)	Joaquin Miller	Oak	1.08	North	2	1845	61.9	A	2285	63.7	A
F125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1.83	North	2	1828	61.3	A	2298	62.5	A
F126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1.63	North	2	1338	47.2	D	1949	43.8	D
F127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1.6	North	2	902	52.9	C	1705	55	B
F128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1.85	North	2	1811	61.7	A	2254	64.7	A
F129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1.07	North	2	1945	65.6	A	2295	65.2	A
F130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1.4	North	2	1857	60.8	A	2230	51.1	C
F131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1.84	North	4	2370	63.9	A	2367	65.4	A
F132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1.65	North	4	2381	54.7	C	2370	46.7	D
F133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1.04	North	4	1969	44.9	D	2370	39.2	E
F134	SR 24 - WB	Fish Ranch Road (CC)	Caldecott (exit)	Oak	0.99	North	4	2019	58.8	B	2370	59.2	B
F135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1.73	North	4	2014	65.5	A	2370	65.7	A
F136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1.86	North	4	2389	59.3	B	2370	61.4	A
F137	SR 84 - EB	San M CL	Toll Plaza	Fre	3.29	South	3	2355	65.3	A	2345	67.2	A
F138	SR 84 - EB	Toll Plaza	Thornton	Fre	0.54	South	3	2293	66.4	A	2342	66.9	A
F139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	New	1.16	South	3	2178	64.7	A	2340	66.6	A

Table B-3: 2018 LOS Monitoring Results for Freeways (Tier 1) – Weekday Midday Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	New	1.2	South	2	2136	46.0	D	2337	45.5	D
F141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	1.21	South	3	2211	47.5	D	2304	46.6	D
F142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	1.15	South	3	2069	63.3	A	2233	65.8	A
F143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	0.54	South	3	2316	47.9	D	2274	51.5	C
F144	SR 84 - WB	Toll Plaza	San M CL	Fre	3.29	Central	3	2360	61.2	A	2318	67.7	A
F145	SR 92 - EB	San M CL	Toll Plaza	Hay	2.78	Central	3	2380	66.1	A	2370	67.4	A
F146	SR 92 - EB	Toll Plaza	Clawiter	Hay	1.87	Central	3	2363	66.3	A	2368	67.6	A
F147	SR 92 - EB	Clawiter	I-880	Hay	2.07	Central	4	1392	58.4	B	1670	59.2	B
F148	SR 92 - WB	I-880	Clawiter	Hay	2.05	Central	4	2265	61.2	A	2326	63.6	A
F149	SR 92 - WB	Clawiter	Toll Plaza	Hay	1.88	Central	4	2387	53.8	C	2370	52.5	C
F150	SR 92 - WB	Toll Plaza	San M CL	Hay	2.79	Central	3	2387	65.2	A	2370	52.5	C

B.4 | Ramps and Special Segments (Tier 1) - PM Peak Period (INRIX data)

Table B-4: 2018 LOS Monitoring Results for Ramps and Special Segments (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
R1	I-80/I-580 Interchange	I-80 SB	I-580 EB	Oak	0.4	North	2	3679	28.5	C	3706	25.1	D
R2	I-80/I-580 Interchange	I-580 WB	I-80 NB	Oak	0.45	North	2	3675	18.9	F	3706	18.2	F
R3	SR 24 WB/I-580 WB	SR 24 Off	I-580 On	Oak	0.77	North	2	7	49.8	N/A	6	51.51	N/A
R4	I-580/SR 24 Interchange	I-580 WB	SR-24 EB	Oak	0.53	North	2	3352	17.5	F	3388	29.6	D
R5	I-580/SR 24 Interchange	SR-24 WB	I-580 EB	Oak	0.75	North	2	3168	16.2	F	3575	14	F
R6	SR13/SR 24 Interchange	SR-13 NB	SR-24 EB	Oak	0.33	North	1	3591	11.4	F	3697	13.2	F
R7	SR13/SR 24 Interchange	SR-24 WB	SR-13 SB	Oak	0.16	North	1	3332	24.9	B	3649	19.8	D
R8	I-880/I-238 Interchange	I-880 SB	I-238 EB	SL	0.75	Central	2	2150	26.0	E	3230	33.2	C
R9	I-880/I-238 Interchange	I-238 WB	I-880 NB	SL	0.51	Central	2	2150	52.9	A	3224	53.6	A
R10	I-880/I-238 Interchange	I-880 NB	I-238 EB	SL	0.42	Central	2	3679	21.2	D	3706	28.4	B
R11	I-880/I-238 Interchange	I-238 WB	I-880 SB	SL	0.81	Central	2	3676	47.4	B	3706	44.4	B
R12	I-580 /I-238 Interchange	I-580 SB	I-238 WB	Hay	0.7	Central	1	3679	52.0	A	3706	64.6	A
R13	I-580 /I-238 Interchange	I-238 EB	I-580 NB	Hay	0.36	Central	1	3679	64.4	A	3704	65.4	A
R14	I-580/I-680 Interchange	I-580 EB	I-680 NB	Pleas	0.52	East	1	3285	33.6	A	3619	33.6	A
R15	I-580/I-680 Interchange	I-580 EB	I-680 SB	Pleas	0.29	East	1	2685	39.5	A	3053	39.4	A

Table B-4: 2018 LOS Monitoring Results for Ramps and Special Segments (Tier 1) - PM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
R16	I-580/I-680 Interchange	I-680 NB	I-580 EB	Pleas	0.92	East	2	3666	53.8	B	3703	47.6	C
R17	I-580/I-680 Interchange	I-680 NB	I-580 WB	Pleas	0.62	East	1	2919	37.6	A	3322	37	A
R18	I-580/I-680 Interchange	I-580 WB	I-680 NB	Pleas	0.42	East	2	3550	50.1	A	3700	51.6	A
R19	I-580/I-680 Interchange	I-580 WB	I-680 SB	Pleas	0.64	East	1	3426	37.4	A	3677	35	B
R20	I-580/I-680 Interchange	I-680 SB	I-580 EB	Pleas	1.22	East	2	3630	58.1	B	3695	55.2	B
R21	I-580/I-680 Interchange	I-680 SB	I-580 WB	Pleas	0.44	East	2	3621	48.6	B	3667	55.7	A
R22	I-880/SR 260 Connection	I-880 SB	SR-260 WB	Oak	0.99	North	varies	6	16.6	E	6	10	F
R23	I-880/SR 260 Connection	SR-260 EB	I-880 NB	Oak	0.41	North	varies	6	17.2	F	6	16.31	F

B.5 | Ramps and Special Segments (Tier 1) - AM Peak Period (INRIX data)

Table B-5: 2018 LOS Monitoring Results for Ramps and Special Segments (Tier 1) - AM Peak Period (INRIX data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
R1	I-80/I-580 Interchange	I-80 SB	I-580 EB	Oak	0.4	North	2	3619	46.1	A	3706	46.3	A
R2	I-80/I-580 Interchange	I-580 WB	I-80 NB	Oak	0.45	North	2	3617	37.4	A	3706	40.9	A
R3	SR 24 WB/I-580 WB	SR 24 Off	I-580 On	Oak	0.77	North	2	7	30.7	N/A	6	47.2	N/A
R4	I-580/SR 24 Interchange	I-580 WB	SR-24 EB	Oak	0.53	North	2	2998	53.5	A	3152	53.0	A
R5	I-580/SR 24 Interchange	SR-24 WB	I-580 EB	Oak	0.75	North	2	2914	42.7	B	3115	48.5	A
R6	SR13/SR 24 Interchange	SR-13 NB	SR-24 EB	Oak	0.33	North	1	3065	43.9	A	3591	44.8	A
R7	SR13/SR 24 Interchange	SR-24 WB	SR-13 SB	Oak	0.16	North	1	3219	37.3	A	3484	38.1	A
R8	I-880/I-238 Interchange	I-880 SB	I-238 EB	SL	0.75	Central	2	3608	50.0	A	3705	49.4	A
R9	I-880/I-238 Interchange	I-238 WB	I-880 NB	SL	0.51	Central	2	3619	13.0	F	3706	11.1	F
R10	I-880/I-238 Interchange	I-880 NB	I-238 EB	SL	0.42	Central	2	3619	46.8	A	3706	46.5	A
R11	I-880/I-238 Interchange	I-238 WB	I-880 SB	SL	0.81	Central	2	3619	29.6	E	3706	37.2	C
R12	I-580 /I-238 Interchange	I-580 SB	I-238 WB	Hay	0.7	Central	1	3619	45.6	A	3706	45.3	A
R13	I-580 /I-238 Interchange	I-238 EB	I-580 NB	Hay	0.36	Central	1	3619	64.7	A	3706	65.2	A
R14	I-580/I-680 Interchange	I-580 EB	I-680 NB	Pleas	0.52	East	1	3480	30.5	B	3686	38.9	A
R15	I-580/I-680 Interchange	I-580 EB	I-680 SB	Pleas	0.29	East	1	3081	21.5	E	3505	22.1	E
R16	I-580/I-680 Interchange	I-680 NB	I-580 EB	Pleas	0.92	East	2	3575	55.4	B	3699	56.6	B
R17	I-580/I-680 Interchange	I-680 NB	I-580 WB	Pleas	0.62	East	1	3340	33.8	B	3226	35.9	B
R18	I-580/I-680 Interchange	I-580 WB	I-680 NB	Pleas	0.42	East	2	3557	46.1	B	3706	49.3	A
R19	I-580/I-680 Interchange	I-580 WB	I-680 SB	Pleas	0.64	East	1	3594	16.3	F	3689	12.7	F

Table B-5: 2018 LOS Monitoring Results for Ramps and Special Segments (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	# Lanes	2016 results			2018 Results		
								Sample	Speed	LOS	Sample	Speed	LOS
R20	I-580/I-680 Interchange	I-680 SB	I-580 EB	Pleas	1.22	East	2	3556	61.8	A	3702	61.3	A
R21	I-580/I-680 Interchange	I-680 SB	I-580 WB	Pleas	0.44	East	2	3555	58.5	A	3699	56.1	A
R22	I-880/SR 260 Connection	I-880 SB	SR-260 WB	Oak	0.99	North	varies	6	39.0	A	6	15.4	A
R23	I-880/SR 260 Connection	SR-260 EB	I-880 NB	Oak	0.41	North	varies	6	4.3	F	6	15.7	F

B.6 | Arterials (Tier 1) - PM Peak Period

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A1	150th St - EB	Hesperian	I-580	San L	0.49	II	Central	2	6	13.0	E	INRIX	1198	12.7	E
A2	150th St - WB	I-580	Hesperian	San L	0.49	II	Central	2	6	12.9	E	INRIX	68	15.6	D
A3	A Street - EB	I-880	Western	Hay	1.08	II	Central	2	6	21.7	C	INRIX	1529	20.8	C
A4	A Street - EB	Western	SR 185 (previously SR 238)	Hay	0.31	III	Central	2	6	11.9	D	INRIX	2477	10.8	D
A5	A Street - WB	SR 238	Western	Hay	0.54	III	Central	2	6	17.2	C	INRIX	2381	14.1	C
A6	A Street - WB	Western	I-880	Hay	1.07	II	Central	2	6	19.1	C	INRIX	1338	17.9	D
A7	Atlantic - EB	Main	Webster	Ala	0.81	II	North	2	6	23.3	C	Floating Car	6	19.2	C
A8	Atlantic - WB	Webster	Main	Ala	0.81	II	North	2	6	23.4	C	Floating Car	6	25.9	B
A9	Hegenberger - EB	SR 61	Edgewater	Oak	0.77	I		3	6	24.2	C	INRIX	1608	21.7	D
A10	Hegenberger - EB	Edgewater	Baldwin	Oak	0.73	I	North	3	6	24.7	C	INRIX	3344	24.8	C
A11	Hegenberger - EB	Baldwin	E 14th	Oak	1.02	I	North	3	6	25.3	C	INRIX	2319	24.4	C
A12	Hegenberger - WB	E 14th	Baldwin	Oak	1.02	I	North	3	6	24.7	C	INRIX	2273	31.0	B
A13	Hegenberger - WB	Baldwin	Edgewater	Oak	0.72	I	North	3	6	21.9	D	INRIX	2954	24.4	C
A14	Hegenberger - WB	Edgewater	SR 61	Oak	0.77	I	North	3	6	22.6	C	INRIX	2430	23.9	C
A15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	0.49	I	Central	3	8	13.5	E	INRIX	2421	15.0	E
A16	Hesperian - NB	SH 92	La Playa	Hay	0.78	II	Central	3	8	18.0	C	INRIX	2461	14.8	D
A17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	0.43	II	Central	3	8	4.1	F	INRIX	3532	14.4	D
A18	Hesperian - NB	W.Winton Ave	A St	Hay	0.97	II	Central	3	8	22.4	C	INRIX	3619	20.6	C
A19	Hesperian - NB	A St	Hacienda	Uninc	0.67	II	Central	3	8	16.1	D	INRIX	3038	18.4	C
A20	Hesperian - NB	Hacienda	Grant	Uninc	0.66	II	Central	3	8	22.9	C	INRIX	3490	19.7	C
A21	Hesperian - NB	Grant	Llewelling	Uninc	0.27	II	Central	3	8	9.8	F	INRIX	3120	11.2	E
A22	Hesperian - NB	Llewelling	Springlake	Uninc	0.39	II	Central	3	8	19.1	C	INRIX	2604	15.0	D

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A23	Hesperian - NB	Springlake	Fairmont	San L	0.66	II	Central	3	8	10.7	E	INRIX	3271	15.7	D
A24	Hesperian - NB	Fairmont	14th	San L	0.31	II	Central	2	8	12.9	E	INRIX	361	13.9	E
A25	Hesperian - SB	14th	Fairmont	San L	0.31	II	Central	2	8	12.2	E	INRIX	220	16.1	D
A26	Hesperian - SB	Fairmont	Springlake	San L	0.66	II	Central	3	8	14.1	D	INRIX	1759	18.3	C
A27	Hesperian - SB	Springlake	Llewelling	Uninc	0.39	II	Central	3	8	9.7	F	INRIX	2903	12.4	E
A28	Hesperian - SB	Llewelling	Grant	Uninc	0.27	II	Central	3	8	10.3	E	INRIX	3118	12.6	E
A29	Hesperian - SB	Grant	Hacienda	Uninc	0.66	II	Central	3	8	28.4	B	INRIX	3363	21.0	C
A30	Hesperian - SB	Hacienda	A St	Uninc	0.67	II	Central	3	8	16.5	D	INRIX	3028	18.0	C
A31	Hesperian - SB	A St	W.Winton Ave.	Hay	0.97	II	Central	3	8	28.9	B	INRIX	2055	21.8	C
A32	Hesperian - SB	W.Winton Ave	La Playa	Hay	0.43	II	Central	3	8	14.6	D	INRIX	2932	19.9	C
A33	Hesperian - SB	La Playa	SH 92	Hay	0.78	II	Central	3	8	19.1	C	INRIX	1853	19.4	C
A34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	0.49	I	Central	3	8	20.5	D	INRIX	1331	16.8	E
A35	Mowry - EB	I-880	Farwell	Fre	0.28	II	South	3	6	13.7	E	Floating Car	6	26.3	B
A36	Mowry - EB	Farwell	SH 84	Fre	2.48	II	South	3	6	18.4	C	Floating Car	6	20.3	C
A37	Mowry - WB	SH 84	Farwell	Fre	2.53	II	South	3	6	19.4	C	Floating Car	6	21.8	C
A38	Mowry - WB	Farwell	I-880	Fre	0.28	II	South	3	6	36.3	A	Floating Car	6	34.1	A
A39	Park/23rd - EB	Encinal	Santa Clara	Ala	0.23	III	North	2	6	11.1	D	INRIX	2974	9.0	D
A40	Park/23rd - EB	Santa Clara	Kennedy	Ala	0.68	III	North	2	6	13.6	C	INRIX	2676	10.7	D
A41	Park/23rd - EB	Kennedy	E 11th	Oak	0.45	II	North	2	6	17.4	D	INRIX	2205	20.1	C
A42	Park/23rd - WB	E 11th	Kennedy	Oak	0.45	II	North	2	6	22.9	C	INRIX	54	17.7	D
A43	Park/23rd - WB	Kennedy	Santa Clara	Ala	0.74	III	North	2	6	12.6	D	INRIX	244	11.7	D
A44	Park/23rd - WB	Santa Clara	Encinal	Ala	0.23	III	North	2	6	10.2	D	INRIX	2629	9.1	D
A45	MLK Jr Way - NB	SH 24	Adeline	Oak	1.48	II	North	3	9	10.5	E	Floating Car	6	14.9	D
A46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	0.28	II	North	3	10	9.7	F	INRIX	2530	12.4	E
A47	Adeline - NB	MLK Jr - North	Shattuck/Adeline	Berk	0.61	II	North	3	10	16.0	D	INRIX	2455	16.6	D
A48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	0.31	II	North	2	6	13.3	E	INRIX	2739	13.9	E
A49	Shattuck NB	Dwight	University	Berk	0.57	III	North	2	6	12.9	D	INRIX	2991	12.1	D
A50	Shattuck SB	University	Dwight	Berk	0.57	III	North	2	6	11.1	D	INRIX	3081	11.6	D
A51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	0.30	II	North	2	6	16.8	D	INRIX	3508	16.2	D
A52	Adeline - SB	Shattuck/Adeline	MLK Jr - North	Berk	0.61	II	North	3	6	15.7	D	INRIX	2676	17.1	D
A53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	0.29	II	North	3	6	10.6	E	INRIX	2832	12.7	E
A54	MLK Jr Way - SB	Adeline	SH 24	Oak	1.39	II	North	3	6	11.3	E	Floating Car	6	16.8	D

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A55	Tennyson - EB	Hesperian	I-880	Hay	0.86	I	Central	2	6	19.2	D	INRIX	1889	18.3	D
A56	Tennyson - EB	I-880 NB	Rt 238	Hay	1.54	II	Central	2	6	20.9	C	INRIX	1990	18.1	C
A57	Tennyson - WB	Rt 238	I-880	Hay	1.54	II	Central	2	6	16.8	D	INRIX	1646	18.2	C
A58	Tennyson - WB	I-880	Hesperian	Hay	0.86	I	Central	2	6	24.2	C	INRIX	2338	19.0	D
A59	University - EB	I-80 SB	6th	Berk	0.40	II	North	2	6	26.4	B	INRIX	2758	19.1	C
A60	University - EB	6th	San Pablo	Berk	0.32	II	North	2	6	10.4	E	INRIX	3413	11.7	E
A61	University - EB	San Pablo	Sacramento	Berk	0.56	II	North	2	6	14.9	D	INRIX	2781	17.0	D
A62	University - EB	Sacramento	ML King	Berk	0.49	II	North	2	6	14.7	D	INRIX	3172	18.1	C
A63	University - EB	ML King	Shattuck Pl	Berk	0.29	III	North	2	6	15.2	C	INRIX	2217	12.9	D
A64	University - WB	Shattuck Pl	ML King	Berk	0.29	III	North	2	6	13.8	C	INRIX	1830	11.5	D
A65	University - WB	ML King	Sacramento	Berk	0.49	II	North	2	6	20.6	C	INRIX	3369	18.6	C
A66	University - WB	Sacramento	San Pablo	Berk	0.56	II	North	2	6	13.3	E	INRIX	3564	12.9	E
A67	University - WB	San Pablo	6th	Berk	0.32	II	North	2	6	8.1	F	INRIX	3442	12.3	E
A68	University - WB	6th	I-80 SB	Berk	0.40	II	North	2	6	25.1	B	INRIX	2906	26.1	B
A69	SR 13 Ashby - WB	Hiller	Domingo	Oak - Berk	0.81	II	North	1	6	21.9	C	INRIX	2779	20.5	C
A70	SR 13 Ashby - WB	Domingo	College	Berk	0.52	III	North	2	6	17.5	C	INRIX	1784	20.8	B
A71	SR 13 Ashby - WB	College	Telegraph	Berk	0.37	III	North	2	6	13.4	C	INRIX	3612	10.5	D
A72	SR 13 Ashby - WB	Telegraph	Shattuck	Berk	0.38	III	North	2	6	11.3	D	INRIX	3612	10.5	D
A73	SR 13 Ashby - WB	Shattuck	ML King	Berk	0.26	III	North	2	6	11.0	D	INRIX	2538	13.5	C
A74	SR 13 Ashby - WB	ML King	San Pablo	Berk	0.86	III	North	2	6	13.9	C	INRIX	3434	13.8	C
A75	SR 13 Ashby - WB	San Pablo	I-80 Ramps	Berk	0.64	II	North	2	6	18.0	D	INRIX	3374	21.7	C
A76	SR 13 Ashby - EB	I-80	San Pablo	Berk	0.62	II	North	2	6	21.2	C	INRIX	3281	16.4	D
A77	SR 13 Ashby - EB	San Pablo	ML King	Berk	0.86	III	North	2	6	19.7	B	INRIX	3441	17.7	C
A78	SR 13 Ashby - EB	ML King	Shattuck	Berk	0.26	III	North	2	6	9.3	D	INRIX	2827	11.3	D
A79	SR 13 Ashby - EB	Shattuck	Telegraph	Berk	0.38	III	North	2	6	18.2	C	INRIX	3612	10.5	D
A80	SR 13 Ashby - EB	Telegraph	College	Berk	0.37	III	North	2	6	7.7	E	INRIX	3612	10.5	D
A81	SR 13 Ashby - EB	College	Domingo	Berk	0.52	III	North	2	6	9.5	D	INRIX	3408	27.7	A
A82	SR 13 Ashby - EB	Domingo	Hiller	Berk - Oak	0.81	II	North	1	6	19.9	C	INRIX	3408	27.7	B
A83	SR 61 - SB	Atlantic	Cent/Webster	Ala	0.57	III	North	2	6	13.0	C	INRIX	2345	13.1	C
A84	SR 61 - SB	Cent/Webster	Sher/Encino	Ala	0.74	II	North	2	6	18.4	C	INRIX	2096	19.3	C
A85	SR 61 - SB	Sher/Encino	Park	Ala	1.20	II	North	2	6	21.1	C	INRIX	2227	19.1	C
A86	SR 61 - SB	Park	High/Otis	Ala	1.05	II	North	2	6	17.4	D	INRIX	1065	19.9	C

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A87	SR 61 (Doolittle) - SB	High	Island Dr	Ala	0.44	II	North	2	6	22.1	C	INRIX	2835	22.2	C
A88	SR 61 (Doolittle) - SB	Island Dr	Harbor Bay Pkwy	Ala	0.51	I	North	2	6	30.5	B	INRIX	2298	28.9	B
A89	SR 61 - SB	Harbor Bay	Airport Dr	Oak	2.17	I	North	2	6	31.4	B	INRIX	2022	33.1	B
A90	SR 61 (Doolittle) - SB	Airport	Davis	Oak - San L	0.94	I	North	2	6	25.6	C	INRIX	2260	24.0	C
A91	SR 61 (Doolittle) - NB	Davis	Airport	San L - Oak	0.94	I	Central	2	6	25.5	C	INRIX	3433	28.6	B
A92	SR 61 - NB	Airport Dr	Harbor Bay	Oak	2.17	I	North	2	6	37.7	A	INRIX	2733	36.9	A
A93	SR 61 (Doolittle) - NB	Harbor Bay	Island Dr	Ala	0.51	I	North	2	6	32.8	A	INRIX	2771	25.6	C
A94	SR 61 (Doolittle) - NB	Island Dr	High/Otis	Ala	0.44	II	North	2	6	16.3	D	INRIX	2970	19.5	C
A95	SR 61 - NB	High/Otis	Park	Ala	1.05	II	North	2	6	17.5	D	INRIX	1150	19.3	C
A96	SR 61 - NB	Park/Encinal	Sher/Cent	Ala	1.20	II	North	2	6	21.4	C	INRIX	1806	19.3	C
A97	SR 61 - NB	Sher/Cent	Web/Cent	Ala	0.74	II	North	2	6	15.0	D	INRIX	1552	19.0	C
A98	SR 61 - NB	Cent/Web	Atlantic	Ala	0.57	III	North	2	6	11.1	D	INRIX	1405	14.0	C
A99	SR 77 (42nd) - EB	I-880 NB	E 14th	Oak	0.36	I	North	2	6	28.2	B	INRIX	644	21.7	D
A100	SR 77 (42nd) - WB	E 14 th	I-880 NB	Oak	0.36	I	North	2	6	30.8	B	INRIX	1191	22.9	C
A101	Decoto - WB	SH 238/Mission	Union Square	Uni Cty	0.86	II	South	2	6	23.0	C	INRIX	3277	19.9	C
A102	Decoto - WB	Union Square	Alv-Niles Rd	Uni Cty	0.24	II	South	2	6	8.0	F	INRIX	2587	19.0	C
A103	Decoto - WB	Alv-Niles Rd	Fremont CL	Uni Cty	0.65	II	South	2	6	24.2	B	INRIX	2607	23.4	C
A104	Decoto - WB	Fremont CL	I-880 NB (off)	Fre	1.15	II	South	2	6	24.8	B	INRIX	2712	25.1	B
A105	Decoto - EB	I-880 NB (off)	Union City CL	Fre	1.15	II	South	2	6	19.0	C	INRIX	3612	20.4	C
A106	Decoto - EB	Union City CL	Alv-Niles Rd	Uni Cty	0.66	II	South	2	8	12.8	E	INRIX	3088	19.9	C
A107	Decoto - EB	Alv-Niles Rd	Union Square	Uni Cty	0.24	II	South	2	8	10.6	E	INRIX	3605	20.7	C
A108	Decoto - EB	Union Square	SH 238/Mission	Uni Cty	0.85	II	South	2	6	18.1	C	INRIX	928	20.6	C
A109	SR 84/Mowry (Fre)-WB	SH 238	Peralta	Fre	0.81	I	South	2	6	26.6	C	INRIX	2814	30.6	B
A110	SR 84/Peralta (Fre)-WB	Mowry	Fremont	Fre	1.66	I	South	1	6	25.7	C	INRIX	948	28.1	B
A111	SR 84/Fremont(Fre)-WB	Peralta	Thornton	Fre	0.33	II	South	2	8	9.3	F	INRIX	3238	14.8	D
A112	SR 84/Thornton(Fre)-WB	Fremont	I-880 SB	Fre	1.26	II	South	3	6	23.5	C	INRIX	2976	23.5	C
A113	SR 84/Thornton (Fre)-EB	I-880 SB	Fremont	Fre	1.26	II	South	3	6	22.9	C	INRIX	3636	18.3	C
A114	SR 84/Fremont (Fre)-EB	Thornton	Peralta	Fre	0.32	II	South	2	6	10.6	E	INRIX	2568	17.7	D
A115	SR 84/Peralta (Fre) - EB	Fremont	Mowry	Fre	1.64	I	South	1	6	22.8	C	INRIX	2042	27.1	C
A116	SR 84/Mowry (Fre) - EB	Peralta	SH 238	Fre	0.86	I	South	2	6	18.0	D	INRIX	3509	15.5	E
A117	1st Street - SB	I-580 Off	N Mines	Liv	0.60	I	East	3	6	13.9	E	INRIX	2063	22.8	C

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A118	1st Street - SB	N Mines	Inman	Liv	1.06	I	East	2	6	29.7	B	INRIX	2548	21.2	D
A119	1st Street - NB	Inman	N Mines	Liv	1.06	I	East	2	6	31.7	B	INRIX	3525	20.9	D
A120	1st Street - NB	N Mines	I-580 Off	Liv	0.60	I	East	3	6	21.6	D	INRIX	3152	21.2	D
A121	SR 84 - EB	SR 238/Mission	Union City Limit	Fre	1.35	41.9	South	1	8	18.4	F	INRIX XD	3558	25.0	E
A122	SR 84 - EB	Union City Limit	Palomares	Fre	0.86	44.5	South	1	6	26.3	E	INRIX XD	3535	30.0	D
A123	SR 84 - EB	Palomares	Niles Cnyn Quarry	Fre	2.16	43.8	South	1	6	34.0	C	INRIX XD	3538	27.0	D
A124	SR 84 - EB	Niles Cnyn Quarry	Sunol Rd	Fre	1.74	46.7	South	1	6	40.5	B	INRIX XD	3589	23.9	E
A125	SR 84 - EB	Sunol Rd	Plea-Sunol Rd	Fre	0.55	27.6	South	1	8	5.0	F	INRIX XD	3423	9.4	F
A126	SR 84 - EB	Ple-Sunol Rd	SR 84 (Off)/I-680	Uninc	0.80	42.9	East	1	8	37.0	B	INRIX XD	3435	24.6	E
A127	SR 84 - EB	SR 84 (Off)/I-680	Vallecitos Ln	Uninc	1.05	50.8	East	1	8	10.8	F	INRIX XD	3694	13.4	F
A128	SR 84 - EB	Vallecitos Ln	Vallecitos Nuc.Cntr	Uninc	1.13	57.5	East	1	8	28.4	F	INRIX XD	3643	29.6	E
A129	SR 84 - EB	Vallecitos Nuc Center Ent.	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.66	58.3	East	1	6	45.3	C	INRIX XD	3611	48.9	B
A130	SR 84 - EB	Culvert (Lat/Long: 37.613854,-121.817224)	Ruby Hill /Kaithoff	Uninc	1.63	59.2	East	2	6	61.9	A	INRIX XD	3563	55.7	A
A131	SR 84 - EB	Ruby Hill./Kaithoff	Isabel/Vallecitos	Liv	0.38	I	East	1	6	33.3	A	INRIX XD	3401	42.1	A
A132	SR 84 (Liv) - NB	Isabel/Vallecitos	Vineyard	Liv	1.12	I	East	1	6	29.9	B	INRIX XD	3434	40.7	A
A133	SR 84 (Liv) - NB	Vineyard	Concannon	Liv	0.60	I	East	1	6	26.3	C	INRIX XD	3389	31.3	B
A134	SR 84 (Liv) - NB	Concannon	Stanley	Liv	1.05	I	East	1	6	39.5	A	INRIX XD	3269	43.3	A
A135	SR 84 (Liv) - NB	Stanley	W. Jack London Blvd.	Liv	0.90	I	East	1	6	41.6	A	INRIX XD	3473	38.3	A
A136	SR 84 (Liv) - NB	W. Jack London Blvd.	Airway/Kitty Hawk	Liv	0.49	I	East	3	6	40.7	A	INRIX XD	3627	21.9	D
A137	Airway Blvd (old SR 84) - NB	SR 84	I-580 EB off ramp	Liv	1.06	I	East	1	6	33.2	B	INRIX	1510	33.0	B
A138	Airway Blvd (old SR 84) - SB	I-580 EB off ramp	SR 84	Liv	1.06	I	East	1	6	37.0	A	INRIX	864	31.5	B
A139	SR 84 (Liv) - SB	Airway/Kitty	W. Jack London Blvd.	Liv	0.49	I	East	3	6	30.2	B	INRIX XD	3600	31.1	B
A140	SR 84 (Liv) - SB	W. Jack London Blvd.	Stanley	Liv	0.90	I	East	1	6	42.4	A	INRIX XD	3510	46.3	A
A141	SR 84 (Liv) - SB	Stanley	Concannon	Liv	1.05	I	East	1	6	28.3	B	INRIX XD	3371	37.7	A
A142	SR 84 (Liv) - SB	Concannon	Vineyard	Liv	0.60	I	East	1	6	14.7	E	INRIX XD	3393	24.2	C
A143	SR 84 (Liv) - SB	Vineyard	Isabel/Vallecitos	Liv	1.12	I	East	1	6	34.5	B	INRIX XD	2917	36.6	A
A144	SR 84 - WB	Isabel/Vallecitos	Ruby Hill /Kaithoff	Liv	0.38	I	East	1	6	32.9	B	INRIX XD	3330	38.7	A

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A145	SR 84 - WB	Ruby Hill /Kaithoff	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.63	55.8	East	2	6	57.2	A	INRIX XD	3151	55.2	A
A146	SR 84 - WB	Culvert (Lat/Long: 37.613854,-121.817224)	Vallecitos Nuc.Cntr	Uninc	1.65	56.5	East	1	6	56.6	A	INRIX XD	3275	56.6	A
A147	SR 84 - WB	Vallecitos Nuc.Cntr	Vallecitos Ln	Uninc	1.14	52.5	South	1	6	52.9	A	INRIX XD	3267	55.0	A
A148	SR 84 - WB	Vallecitos Ln	SR 84/I-680 On	Uninc	0.86	55.3	South	1	6	52.8	A	INRIX XD	1482	53.7	A
A149	SR 84 - WB	SR 84/I-680 On	Ple-Sunol Rd	Uninc	0.62	41.4	South	1	6	36.0	B	INRIX XD	2025	35.9	B
A150	SR 84 - WB	Ple-Sunol Rd	Sunol Rd	Fre	0.55	41.9	South	1	6	34.0	B	INRIX XD	2126	41.9	A
A151	SR 84 - WB	Sunol Rd	Niles Canyon Quarry	Fre	1.74	48.5	South	1	6	46.9	A	INRIX XD	2218	46.9	A
A152	SR 84 - WB	Niles Cyn Quarry	E Fremont City Limit	Fre	1.00	47.5	South	1	6	45.0	A	INRIX XD	2215	44.1	A
A153	SR 84 - WB	E Fremont City Limit	Union City Limit	Fre	2.03	41.8	South	1	6	42.4	A	INRIX XD	2211	41.6	A
A154	SR 84 - WB	Union City Limit	SR 238	Fre	1.35	31.7	South	1	6	32.7	A	INRIX XD	2194	35.7	A
A155	SR 92 - EB	I-880	Mission	Hay	1.71	II	Central	3	6	10.6	E	INRIX	3663	16.1	D
A156	SR 92 - WB	Mission	I-880	Hay	1.71	II	Central	3	6	22.8	C	INRIX	2599	20.8	C
A157	SR 112 (Davis) - EB	Doolittle	I-880	San L	0.52	II	Central	2	6	12.6	E	INRIX	3087	14.2	D
A158	SR 112 (Davis) - EB	I-880	San Leandro	San L	0.99	II	Central	2	6	13.0	E	INRIX	3049	13.1	E
A159	SR 112 (Davis) - EB	San Leandro	14th	San L	0.28	III	Central	2	6	11.9	D	INRIX	2684	13.1	C
A160	SR 112 (Davis) - WB	E 14th	San Leandro	San L	0.28	III	Central	2	6	11.4	D	INRIX	2019	12.0	D
A161	SR 112 (Davis) - WB	San Leandro	I-880	San L	0.99	II	Central	2	6	19.1	C	INRIX	3117	15.2	D
A162	SR 112 (Davis) - WB	I-880	Doolittle	San L	0.52	II	Central	2	6	19.0	C	INRIX	3435	15.2	D
A163	SR 123 San Pablo - SB	Carlson	Washington	Alb	0.51	II	North	2	8	21.9	C	INRIX	3369	16.2	D
A164	SR 123 San Pablo - SB	Washington	Marin	Alb	0.36	III	North	2	8	10.5	D	INRIX	3156	15.1	C
A165	SR 123 San Pablo - SB	Marin	Gilman	Alb - Berk	0.45	II	North	2	8	9.6	F	INRIX	3372	14.7	D
A166	SR 123 San Pablo - SB	Gilman	University	Berk	0.81	II	North	2	8	17.9	D	INRIX	2770	18.3	C
A167	SR 123 San Pablo - SB	University	Allston	Berk	0.19	III	North	2	8	11.6	D	INRIX	3288	17.4	C
A168	SR 123 San Pablo - SB	Allston	Dwight	Berk	0.38	II	North	2	8	20.7	C	INRIX	3288	17.4	D
A169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	0.64	II	North	2	8	14.2	D	INRIX	2981	17.1	D
A170	SR 123 San Pablo - SB	Ashby	Stanford	Oak	0.80	II	North	2	8	20.1	C	INRIX	3388	18.7	C
A171	SR 123 San Pablo - SB	Stanford	53rd	Oak	0.27	II	North	2	8	13.6	E	INRIX	3555	15.0	D
A172	SR 123 San Pablo - SB	53rd	Park	Emery	0.34	II	North	2	8	10.1	E	INRIX	3555	15.0	D
A173	SR 123 San Pablo - SB	Park	35th	Emery-Oak	0.44	II	North	2	8	6.4	F	INRIX	2205	15.4	D

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A174	SR 123 San Pablo - NB	35th	Park	Oak -Emery	0.42	II	North	2	6	24.5	B	INRIX	1824	13.3	E
A175	SR 123 San Pablo - NB	Park	53rd	Emery	0.34	II	North	2	6	18.9	C	INRIX	3580	15.3	D
A176	SR 123 San Pablo - NB	53rd	Stanford	Oak	0.27	II	North	2	8	7.1	F	INRIX	3580	15.3	D
A177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	0.80	II	North	2	8	14.7	D	INRIX	3520	12.3	E
A178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	0.64	II	North	2	8	13.2	E	INRIX	3063	17.5	D
A179	SR 123 San Pablo - NB	Dwight	Allston	Berk	0.38	II	North	2	8	19.4	C	INRIX	3351	12.5	E
A180	SR 123 San Pablo - NB	Allston	University	Berk	0.19	III	North	2	8	12.9	D	INRIX	3351	12.5	D
A181	SR 123 San Pablo - NB	University	Gilman	Berk	0.81	II	North	2	8	12.9	E	INRIX	3157	14.7	D
A182	SR 123 San Pablo - NB	Gilman	Marin	Alb - Berk	0.45	II	North	2	8	16.5	D	INRIX	3542	13.9	E
A183	SR 123 San Pablo - NB	Marin	Washington	Alb	0.36	III	North	2	8	10.7	D	INRIX	3356	14.3	C
A184	SR 123 San Pablo - NB	Washington	Carlson	Alb	0.51	II	North	2	8	6.8	F	INRIX	3478	15.2	D
A185	SR 185 (International Blvd) - SB	42nd	46th St	Oak	0.29	II	North	2	6	20.9	C	INRIX	1187	14.4	D
A186	SR 185 (International Blvd) - SB	46th St	Seminary	Oak	0.78	II	North	2	6	19.6	C	INRIX	2079	17.6	D
A187	SR 185 (International Blvd) - SB	Seminary	73rd	Oak	0.80	II	North	2	6	12.2	E	INRIX	940	7.9	F
A188	SR 185 (International Blvd) - SB	73rd Ave	98th Ave	Oak	1.41	II	North	2	6	16.1	D	INRIX	430	13.9	E
A189	SR 185 (International Blvd) - SB	98th	Broadmoor	Oak	0.75	II	North	2	6	17.6	D	INRIX	859	15.5	D
A190	SR 185 (14th) - SB	Broadmoor	Davis	San L	0.73	II	Central	2	6	15.1	D	INRIX	1922	17.4	D
A191	SR 185 (14th) - SB	Davis	San Leandro	San L	1.06	III	Central	2	6	17.1	C	INRIX	2156	15.7	C
A192	SR 185 (14th) - SB	San L Blvd	Hesperian	San L	0.94	II	Central	2	6	20.7	C	INRIX	3033	17.9	D
A193	SR 185 (14th) - SB	Hesperian	Bayfair	San L	0.47	II	Central	2	6	17.9	D	INRIX	1905	16.6	D
A194	SR 185 (14th) - SB	Bayfair	170th	Uninc	1.19	II	South	2	6	17.4	D	INRIX	1417	18.6	C
A195	SR 185 (14th) - SB	170th	Llewelling	Uninc	0.20	II	South	2	6	13.5	E	INRIX	2120	19.3	C
A196	SR 185 (14th) - SB	Llewelling	Sunset	Uninc	1.05	II	South	2	6	15.8	D	INRIX	1434	19.9	C
A197	SR 185 Hayward - SB	Sunset	SR 92/238	Hay	0.84	III	Central	2	6	17.1	C	INRIX	2632	16.9	C
A198	SR 185 Hayward - NB	A Street (SR 92/238 until 2012)	Sunset	Hay	0.43	III	Central	2	6	19.3	B	INRIX	2018	19.9	B
A199	SR 185 (14th) - NB	Sunset	Llewelling	Uninc	1.05	II	South	2	6	21.1	C	INRIX	411	21.2	C
A200	SR 185 (14th) - NB	Llewelling	170th	Uninc	0.20	II	South	2	6	22.7	C	INRIX	1535	22.0	C
A201	SR 185 (14th) - NB	170th	Bayfair	Uninc	1.19	II	South	2	6	17.6	D	INRIX	930	16.6	D

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A202	SR 185 (14th) - NB	Bayfair	Hesperian	San L	0.47	II	Central	2	6	20.4	C	INRIX	1349	14.7	D
A203	SR 185 (14th) - NB	Hesperian	San L Blvd	San L	0.94	II	Central	2	6	17.8	D	INRIX	2337	20.1	C
A204	SR 185 (14th) - NB	San Leandro	Davis	San L	1.06	III	Central	1	6	14.8	C	INRIX	1279	13.7	C
A205	SR 185 (14th) - NB	Davis	Broadmoor	San L	0.73	II	Central	2	6	17.1	D	INRIX	1855	16.3	D
A206	SR 185 (International Blvd) - NB	Broadmoor	98th	Oak	0.75	II	North	2	6	14.7	D	INRIX	531	15.0	D
A207	SR 185 (International Blvd) - NB	98th Ave	73rd Ave	Oak	1.41	II	North	2	6	17.0	D	INRIX	820	13.0	E
A208	SR 185 (International Blvd) - NB	73rd Ave	Seminary	Oak	0.80	II	North	2	6	21.4	C	INRIX	789	13.4	E
A209	SR 185 (International Blvd) - NB	Seminary	46th St	Oak	0.78	II		2	6	20.0	C	INRIX	1765	15.1	D
A210	SR 185 (International Blvd) - NB	46th St	42nd	Oak	0.29	II		2	8	6.6	F	INRIX	743	13.0	E
A211	SR 238 (Foothill) - NB	Jackson	City Center	Hay	0.63	III	Central	4	6	16.0	C	INRIX	3706	15.3	C
A212	SR 238 (Foothill) - NB	City Center	I-580	Hay	0.73	II	South	3	6	14.3	D	INRIX	3436	20.7	C
A213	SR 238 (Foothill) - NB	I-580 Ramp	I-580 Merge	Uninc	0.68	I	South	1	6	28.0	C	Floating Car	6	37.0	A
A214	SR 238 (Foothill) - SB	I-580	Cstro V Blvd	Uninc	0.73	I	South	3	6	34.1	B	Floating Car	6	35.9	A
A215	SR 238 (Foothill) - SB	Cstro V Blvd	City Center	Hay-Uninc	1.04	II	Central	3	6	26.7	B	INRIX	2970	18.7	C
A216	SR 238 (Foothill) - SB	City Center	A Street	Hay	0.16	III	Central	3	6	7.3	E	INRIX	3200	16.7	C
A217	SR 238 (Mission) - NB	680 NB Rmp	Stevenson	Fre	2.35	I	South	2	6	32.6	B	INRIX	1691	31.0	B
A218	SR 238 (Mission) - NB	Stevenson	Nursery	Fre	2.43	I	South	2	6	17.3	D	INRIX	3641	26.7	C
A219	SR 238 (Mission) - NB	Nursery	Tamarack	Uni Cty	2.63	I	South	3	6	27.0	C	INRIX	3501	31.1	B
A220	SR 238 (Mission) - NB	Tamarack	Industrial	Uni Cty - Hay	1.96	I	South	3	6	21.8	D	INRIX	3706	21.7	D
A221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	1.46	II	Central	2	6	14.3	D	INRIX	3706	20.7	C
A222	SR 238 (Mission) - NB	Sorenson	Jackson	Hay	1.83	II	Central	2	6	16.8	D	INRIX	3622	19.7	C
A223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	1.83	II	Central	2	6	19.1	C	INRIX	3394	22.8	C
A224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	1.46	II	Central	2	6	21.0	C	INRIX	3588	24.0	B
A225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay - Uni Cty	1.96	I	Central	3	6	25.8	C	INRIX	3611	26.2	C
A226	SR 238 (Mission) - SB	Tamarack	Nursery	Uni Cty	2.63	I	South	3	6	31.1	B	INRIX	3000	32.5	B
A227	SR 238 (Mission) - SB	Nursery	Stevenson	Fre	2.43	I	South	2	6	23.2	C	INRIX	2682	26.9	C
A228	SR 238 (Mission) - SB	Stevenson	680 NB Rmp	Fre	2.35	I	South	2	6	24.7	C	INRIX	3643	20.6	D

Table B-6: 2018 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	1.35	I	North	2	6	30.6	A	INRIX	2846	26.4	C
A230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	1.43	I	North	2	6	26.3	A	INRIX	1201	25.9	C
A231	SR 262 (Mission) - EB	I-880 NB	I-680 NB	Fre	1.48	I	South	2	6	26.0	C	INRIX	3706	21.2	D
A232	SR 262 (Mission) - WB	I-680 NB	I-880 SB	Fre	1.67	I	South	2	6	26.0	C	INRIX	3590	31.8	B
A233	SR 84 (Liv) - NB - realign	Airway	I-580 WB (off)	Liv	0.52	I	East	3	6	26.5	C	INRIX XD	2874	35.0	B
A234	SR 84 (Liv) - SB - realign	I-580 WB (off)	Airway)	Liv	0.53	I	East	3	6	25.1	C	INRIX XD	2477	24.8	C

B.7 | Arterials (Tier 1) - AM Peak Period

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A1	150th St - EB	Hesperian	I-580	San L	0.49	II	Central	2	6	16.1	D	INRIX	469	13.4	E
A2	150th St - WB	I-580	Hesperian	San L	0.49	II	Central	2	6	14.8	D	INRIX	324	14.5	D
A3	A Street - EB	I-880	Western	Hay	1.08	II	Central	2	6	20.5	C	INRIX	1129	21.1	C
A4	A Street - EB	Western	SR 185 (previously SR 238)	Hay	0.31	III	Central	2	6	11.2	D	INRIX	1868	12.2	D
A5	A Street - WB	SR 238	Western	Hay	0.54	III	Central	2	6	18.3	C	INRIX	3405	16.3	C
A6	A Street - WB	Western	I-880	Hay	1.07	II	Central	2	6	17.0	D	INRIX	2052	19.0	C
A7	Atlantic - EB	Main	Webster	Ala	0.81	II	North	2	6	21.0	C	Floating Car	6	21.1	C
A8	Atlantic - WB	Webster	Main	Ala	0.81	II	North	2	6	28.5	B	Floating Car	6	26.4	B
A9	Hegenberger - EB	SR 61	Edgewater	Oak	0.77	I		3	6	18.9	D	INRIX	1937	23.4	C
A10	Hegenberger - EB	Edgewater	Baldwin	Oak	0.73	I	North	3	6	22.2	C	INRIX	3471	24.2	C
A11	Hegenberger - EB	Baldwin	E 14th	Oak	1.02	I	North	3	6	24.1	C	INRIX	2390	27.6	C
A12	Hegenberger - WB	E 14th	Baldwin	Oak	1.02	I	North	3	6	25.6	C	INRIX	2563	30.5	B
A13	Hegenberger - WB	Baldwin	Edgewater	Oak	0.72	I	North	3	6	27.5	C	INRIX	3126	25.6	C
A14	Hegenberger - WB	Edgewater	SR 61	Oak	0.77	I	North	3	6	27.3	C	INRIX	2896	25.1	C
A15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	0.49	I	Central	3	6	17.7	D	INRIX	1589	15.0	E
A16	Hesperian - NB	SH 92	La Playa	Hay	0.78	II	Central	3	6	23.8	C	INRIX	1536	20.1	C
A17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	0.43	II	Central	3	6	18.2	C	INRIX	3011	20.4	C
A18	Hesperian - NB	W.Winton Ave	A St	Hay	0.97	II	Central	3	6	22.4	C	INRIX	3574	22.6	C
A19	Hesperian - NB	A St	Hacienda	Uninc	0.67	II	Central	3	6	21.4	C	INRIX	2738	23.2	C
A20	Hesperian - NB	Hacienda	Grant	Uninc	0.66	II	Central	3	6	31.9	A	INRIX	3345	24.7	B

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A21	Hesperian - NB	Grant	Llewelling	Uninc	0.27	II	Central	3	6	11.3	E	INRIX	2823	12.0	E
A22	Hesperian - NB	Llewelling	Springlake	Uninc	0.39	II	Central	3	6	24.3	B	INRIX	2600	16.9	D
A23	Hesperian - NB	Springlake	Fairmont	San L	0.66	II	Central	3	6	16.1	D	INRIX	3137	17.2	D
A24	Hesperian - NB	Fairmont	14th	San L	0.31	II	Central	2	6	13.0	E	INRIX	258	17.4	D
A25	Hesperian - SB	14th	Fairmont	San L	0.31	II	Central	2	6	17.4	D	INRIX	177	14.0	D
A26	Hesperian - SB	Fairmont	Springlake	San L	0.66	II	Central	3	6	17.0	D	INRIX	2112	21.2	C
A27	Hesperian - SB	Springlake	Llewelling	Uninc	0.39	II	Central	3	6	16.8	D	INRIX	2950	16.2	D
A28	Hesperian - SB	Llewelling	Grant	Uninc	0.27	II	Central	3	6	15.5	D	INRIX	3421	15.6	D
A29	Hesperian - SB	Grant	Hacienda	Uninc	0.66	II	Central	3	6	26.8	B	INRIX	3541	22.8	C
A30	Hesperian - SB	Hacienda	A St	Uninc	0.67	II	Central	3	6	24.3	B	INRIX	3472	21.3	C
A31	Hesperian - SB	A St	W.Winton Ave.	Hay	0.97	II	Central	3	6	16.8	D	INRIX	3308	21.1	C
A32	Hesperian - SB	W.Winton Ave	La Playa	Hay	0.43	II	Central	3	6	21.4	C	INRIX	3570	18.9	C
A33	Hesperian - SB	La Playa	SH 92	Hay	0.78	II	Central	3	6	16.6	D	INRIX	3155	18.9	C
A34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	0.49	I	Central	3	6	26.0	C	INRIX	2983	19.2	D
A35	Mowry - EB	I-880	Farwell	Fre	0.28	II	South	3	6	26.4	B	Floating Car	6	28.8	B
A36	Mowry - EB	Farwell	SH 84	Fre	2.48	II	South	3	6	24.6	B	Floating Car	6	25.5	B
A37	Mowry - WB	SH 84	Farwell	Fre	2.53	II	South	3	6	24.4	B	Floating Car	6	21.1	C
A38	Mowry - WB	Farwell	I-880	Fre	0.28	II	South	3	6	22.8	C	Floating Car	6	33.8	A
A39	Park/23rd - EB	Encinal	Santa Clara	Ala	0.23	III	North	2	6	12.1	D	INRIX	2654	11.0	D
A40	Park/23rd - EB	Santa Clara	Kennedy	Ala	0.68	III	North	2	6	10.4	D	INRIX	2581	9.9	D
A41	Park/23rd - EB	Kennedy	E 11th	Oak	0.45	II	North	2	6	19.2	C	INRIX	2688	15.4	D
A42	Park/23rd - WB	E 11th	Kennedy	Oak	0.45	II	North	2	6	26.8	B	INRIX	66	16.0	D
A43	Park/23rd - WB	Kennedy	Santa Clara	Ala	0.74	III	North	2	6	17.1	C	INRIX	52	13.3	C
A44	Park/23rd - WB	Santa Clara	Encinal	Ala	0.23	III	North	2	6	11.8	D	INRIX	2265	10.9	D
A45	MLK Jr Way - NB	SH 24	Adeline	Oak	1.48	II	North	3	6	18.7	C	Floating Car	6	24.7	B
A46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	0.28	II	North	3	6	11.3	E	INRIX	1767	14.2	D
A47	Adeline - NB	MLK Jr - North	Shattuck/Adeline	Berk	0.61	II	North	3	6	19.1	C	INRIX	1756	17.8	D
A48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	0.31	II	North	2	6	19.2	C	INRIX	2218	15.9	D
A49	Shattuck NB	Dwight	University	Berk	0.57	III	North	2	6	21.5	B	INRIX	2149	13.3	C
A50	Shattuck SB	University	Dwight	Berk	0.57	III	North	2	6	14.2	C	INRIX	2577	14.1	C
A51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	0.30	II	North	2	6	21.2	C	INRIX	3018	19.6	C
A52	Adeline - SB	Shattuck/Adeline	MLK Jr - North	Berk	0.61	II	North	3	6	18.4	C	INRIX	1349	19.1	C

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	0.29	II	North	3	6	8.1	F	INRIX	1853	14.1	D
A54	MLK Jr Way - SB	Adeline	SH 24	Oak	1.39	II	North	3	6	13.6	E	Floating Car	6	22.0	C
A55	Tennyson - EB	Hesperian	I-880	Hay	0.86	I	Central	2	6	19.2	D	INRIX	1907	19.6	D
A56	Tennyson - EB	I-880 NB	Rt 238	Hay	1.54	II	Central	2	6	20.6	C	INRIX	1929	17.9	D
A57	Tennyson - WB	Rt 238	I-880	Hay	1.54	II	Central	2	6	17.9	D	INRIX	1883	18.0	C
A58	Tennyson - WB	I-880	Hesperian	Hay	0.86	I	Central	2	6	21.2	D	INRIX	3030	17.9	D
A59	University - EB	I-80 SB	6th	Berk	0.40	II	North	2	6	13.2	E	INRIX	2810	15.9	D
A60	University - EB	6th	San Pablo	Berk	0.32	II	North	2	6	14.0	D	INRIX	3330	14.4	D
A61	University - EB	San Pablo	Sacramento	Berk	0.56	II	North	2	6	22.4	C	INRIX	3073	18.6	C
A62	University - EB	Sacramento	ML King	Berk	0.49	II	North	2	6	19.1	C	INRIX	3206	20.8	C
A63	University - EB	ML King	Shattuck Pl	Berk	0.29	III	North	2	6	21.1	B	INRIX	1740	15.9	C
A64	University - WB	Shattuck Pl	ML King	Berk	0.29	III	North	2	6	17.4	C	INRIX	1252	14.8	C
A65	University - WB	ML King	Sacramento	Berk	0.49	II	North	2	6	20.7	C	INRIX	3118	21.9	C
A66	University - WB	Sacramento	San Pablo	Berk	0.56	II	North	2	6	21.0	C	INRIX	3181	18.0	C
A67	University - WB	San Pablo	6th	Berk	0.32	II	North	2	6	19.1	C	INRIX	3197	17.1	D
A68	University - WB	6th	I-80 SB	Berk	0.40	II	North	2	6	38.8	A	INRIX	3116	30.9	A
A69	SR 13 Ashby - WB	Hiller	Domingo	Oak - Berk	0.81	II	North	1	6	20.5	C	INRIX	3175	21.1	C
A70	SR 13 Ashby - WB	Domingo	College	Berk	0.52	III	North	2	6	17.9	C	INRIX	2237	21.1	B
A71	SR 13 Ashby - WB	College	Telegraph	Berk	0.37	III	North	2	6	14.4	C	INRIX	3158	17.6	C
A72	SR 13 Ashby - WB	Telegraph	Shattuck	Berk	0.38	III	North	2	6	14.8	C	INRIX	3158	17.6	C
A73	SR 13 Ashby - WB	Shattuck	ML King	Berk	0.26	III	North	2	6	10.0	D	INRIX	2462	15.8	C
A74	SR 13 Ashby - WB	ML King	San Pablo	Berk	0.86	III	North	2	6	20.1	B	INRIX	3408	17.2	C
A75	SR 13 Ashby - WB	San Pablo	I-80 Ramps	Berk	0.64	II	North	2	6	19.9	C	INRIX	3200	21.0	C
A76	SR 13 Ashby - EB	I-80	San Pablo	Berk	0.62	II	North	2	6	29.8	B	INRIX	3238	20.0	C
A77	SR 13 Ashby - EB	San Pablo	ML King	Berk	0.86	III	North	2	6	18.8	C	INRIX	3287	17.3	C
A78	SR 13 Ashby - EB	ML King	Shattuck	Berk	0.26	III	North	2	6	11.2	D	INRIX	2205	13.5	C
A79	SR 13 Ashby - EB	Shattuck	Telegraph	Berk	0.38	III	North	2	6	16.5	C	INRIX	3158	17.6	C
A80	SR 13 Ashby - EB	Telegraph	College	Berk	0.37	III	North	2	6	22.4	B	INRIX	3158	17.6	C
A81	SR 13 Ashby - EB	College	Domingo	Berk	0.52	III	North	2	6	19.1	B	INRIX	2141	43.9	A
A82	SR 13 Ashby - EB	Domingo	Hiller	Berk - Oak	0.81	II	North	1	6	30.7	A	INRIX	2141	43.9	A
A83	SR 61 - SB	Atlantic	Cent/Webster	Ala	0.57	III	North	2	6	16.8	C	INRIX	818	13.8	C
A84	SR 61 - SB	Cent/Webster	Sher/Encino	Ala	0.74	II	North	2	6	17.4	D	INRIX	1636	20.2	C

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A85	SR 61 - SB	Sher/Encino	Park	Ala	1.20	II	North	2	6	19.2	C	INRIX	1898	19.6	C
A86	SR 61 - SB	Park	High/Otis	Ala	1.05	II	North	2	6	20.4	C	INRIX	632	20.8	C
A87	SR 61 (Doolittle) - SB	High	Island Dr	Ala	0.44	II	North	2	6	20.7	C	INRIX	2685	23.2	C
A88	SR 61 (Doolittle) - SB	Island Dr	Harbor Bay Pkwy	Ala	0.51	I	North	2	6	30.6	B	INRIX	2511	28.3	B
A89	SR 61 - SB	Harbor Bay	Airport Dr	Oak	2.17	I	North	2	6	35.3	A	INRIX	1793	35.9	A
A90	SR 61 (Doolittle) - SB	Airport	Davis	Oak - San L	0.94	I	North	2	6	28.3	B	INRIX	1991	30.9	B
A91	SR 61 (Doolittle) - NB	Davis	Airport	San L - Oak	0.94	I	Central	2	6	28.8	B	INRIX	3652	24.0	C
A92	SR 61 - NB	Airport Dr	Harbor Bay	Oak	2.17	I	North	2	6	35.9	A	INRIX	3036	36.1	A
A93	SR 61 (Doolittle) - NB	Harbor Bay	Island Dr	Ala	0.51	I	North	2	6	30.9	A	INRIX	2635	18.0	D
A94	SR 61 (Doolittle) - NB	Island Dr	High/Otis	Ala	0.44	II	North	2	6	17.3	D	INRIX	3076	19.6	C
A95	SR 61 - NB	High/Otis	Park	Ala	1.05	II	North	2	6	15.9	D	INRIX	1211	17.6	D
A96	SR 61 - NB	Park/Encinal	Sher/Cent	Ala	1.20	II	North	2	6	18.6	C	INRIX	1666	16.9	D
A97	SR 61 - NB	Sher/Cent	Web/Cent	Ala	0.74	II	North	2	6	14.9	D	INRIX	1593	18.3	C
A98	SR 61 - NB	Cent/Web	Atlantic	Ala	0.57	III	North	2	6	14.0	C	INRIX	1585	14.2	C
A99	SR 77 (42nd) - EB	I-880 NB	E 14th	Oak	0.36	I	North	2	6	26.5	C	INRIX	254	19.2	D
A100	SR 77 (42nd) - WB	E 14 th	I-880 NB	Oak	0.36	I	North	2	6	27.3	C	INRIX	1074	19.1	D
A101	Decoto - WB	SH 238/Mission	Union Square	Uni Cty	0.86	II	South	2	6	17.5	D	INRIX	3529	19.1	C
A102	Decoto - WB	Union Square	Alv-Niles Rd	Uni Cty	0.24	II	South	2	6	15.1	D	INRIX	3135	18.8	C
A103	Decoto - WB	Alv-Niles Rd	Fremont CL	Uni Cty	0.65	II	South	2	6	25.0	B	INRIX	3135	22.0	C
A104	Decoto - WB	Fremont CL	I-880 NB (off)	Fre	1.15	II	South	2	6	14.1	D	INRIX	3497	18.4	C
A105	Decoto - EB	I-880 NB (off)	Union City CL	Fre	1.15	II	South	2	6	20.0	C	INRIX	2873	24.2	B
A106	Decoto - EB	Union City CL	Alv-Niles Rd	Uni Cty	0.66	II	South	2	6	22.0	C	INRIX	2922	24.4	B
A107	Decoto - EB	Alv-Niles Rd	Union Square	Uni Cty	0.24	II	South	2	6	12.2	E	INRIX	3399	20.7	C
A108	Decoto - EB	Union Square	SH 238/Mission	Uni Cty	0.85	II	South	2	6	17.6	D	INRIX	380	21.2	C
A109	SR 84/Mowry (Fre)-WB	SH 238	Peralta	Fre	0.81	I	South	2	6	20.6	D	INRIX	3520	30.0	B
A110	SR 84/Peralta (Fre)-WB	Mowry	Fremont	Fre	1.66	I	South	1	6	26.6	C	INRIX	1468	26.8	C
A111	SR 84/Fremont(Fre)-WB	Peralta	Thornton	Fre	0.33	II	South	2	6	10.6	E	INRIX	1691	16.1	D
A112	SR 84/Thornton(Fre)-WB	Fremont	I-880 SB	Fre	1.26	II	South	3	6	9.7	F	INRIX	3423	19.0	C
A113	SR 84/Thornton (Fre)-EB	I-880 SB	Fremont	Fre	1.26	II	South	3	6	20.3	C	INRIX	3155	18.0	C
A114	SR 84/Fremont (Fre)-EB	Thornton	Peralta	Fre	0.32	II	South	2	6	14.9	D	INRIX	2756	18.1	C
A115	SR 84/Peralta (Fre) - EB	Fremont	Mowry	Fre	1.64	I	South	1	6	21.3	D	INRIX	1087	27.1	C

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A116	SR 84/Mowry (Fre) - EB	Peralta	SH 238	Fre	0.86	I	South	2	6	21.6	D	INRIX	2432	23.7	C
A117	1st Street - SB	I-580 Off	N Mines	Liv	0.60	I	East	3	6	24.2	C	INRIX	2919	26.8	C
A118	1st Street - SB	N Mines	Inman	Liv	1.06	I	East	2	6	29.7	B	INRIX	3300	25.8	C
A119	1st Street - NB	Inman	N Mines	Liv	1.06	I	East	2	6	28.1	B	INRIX	3261	22.9	C
A120	1st Street - NB	N Mines	I-580 Off	Liv	0.60	I	East	3	6	21.3	D	INRIX	2904	22.0	C
A121	SR 84 - EB	SR 238/Mission	Union City Limit	Fre	1.35	41.9	South	1	6	33.6	B	INRIX XD	2583	43.2	A
A122	SR 84 - EB	Union City Limit	Palomares	Fre	0.86	44.5	South	1	6	44.0	A	INRIX XD	2577	42.3	A
A123	SR 84 - EB	Palomares	Niles Cnyn Quarry	Fre	2.16	43.8	South	1	6	43.3	A	INRIX XD	2578	41.8	A
A124	SR 84 - EB	Niles Cnyn Quarry	Sunol Rd	Fre	1.74	46.7	South	1	6	36.3	C	INRIX XD	2661	42.8	A
A125	SR 84 - EB	Sunol Rd	Plea-Sunol Rd	Fre	0.55	27.6	South	1	6	21.1	C	INRIX XD	2655	12.7	F
A126	SR 84 - EB	Ple-Sunol Rd	SR 84 (Off)/I-680	Uninc	0.80	42.9	East	1	6	40.2	A	INRIX XD	3334	21.6	E
A127	SR 84 - EB	SR 84 (Off)/I-680	Vallecitos Ln	Uninc	1.05	50.8	East	1	6	53.7	A	INRIX XD	3194	58.3	A
A128	SR 84 - EB	Vallecitos Ln	Vallecitos Nuc.Cntr	Uninc	1.13	57.5	East	1	6	54.0	A	INRIX XD	3126	55.6	A
A129	SR 84 - EB	Vallecitos Nuc Center Ent.	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.66	58.3	East	1	6	58.1	A	INRIX XD	3118	56.3	A
A130	SR 84 - EB	Culvert (Lat/Long: 37.613854,-121.817224)	Ruby Hill /Kaithoff	Uninc	1.63	59.2	East	2	6	51.1	B	INRIX XD	3161	53.4	A
A131	SR 84 - EB	Ruby Hill./Kaithoff	Isabel/Vallecitos	Liv	0.38	I	East	1	6	22.3	C	INRIX XD	3131	38.2	A
A132	SR 84 (Liv) - NB	Isabel/Vallecitos	Vineyard	Liv	1.12	I	East	1	6	34.8	B	INRIX XD	3299	35.9	A
A133	SR 84 (Liv) - NB	Vineyard	Concannon	Liv	0.60	I	East	1	6	35.2	A	INRIX XD	3560	25.8	C
A134	SR 84 (Liv) - NB	Concannon	Stanley	Liv	1.05	I	East	1	6	41.2	A	INRIX XD	3508	41.3	A
A135	SR 84 (Liv) - NB	Stanley	W. Jack London Blvd.	Liv	0.90	I	East	1	6	40.1	A	INRIX XD	3536	40.2	A
A136	SR 84 (Liv) - NB	W. Jack London Blvd.	Airway/Kitty Hawk	Liv	0.49	I	East	3	6	32.6	B	INRIX XD	3647	27.8	C
A137	Airway Blvd (old SR 84) - NB	SR 84	I-580 EB off ramp	Liv	1.06	I	East	1	6	30.3	B	INRIX	1480	31.0	B
A138	Airway Blvd (old SR 84) - SB	I-580 EB off ramp	SR 84	Liv	1.06	I	East	1	6	36.2	A	INRIX	565	32.4	B
A139	SR 84 (Liv) - SB	Airway/Kitty	W. Jack London Blvd.	Liv	0.49	I	East	3	6	42.7	A	INRIX XD	3596	29.1	B
A140	SR 84 (Liv) - SB	W. Jack London Blvd.	Stanley	Liv	0.90	I	East	1	6	46.4	A	INRIX XD	3628	43.5	A
A141	SR 84 (Liv) - SB	Stanley	Concannon	Liv	1.05	I	East	1	6	29.6	B	INRIX XD	3567	19.0	D
A142	SR 84 (Liv) - SB	Concannon	Vineyard	Liv	0.60	I	East	1	6	22.9	C	INRIX XD	3611	14.4	E

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A143	SR 84 (Liv) - SB	Vineyard	Isabel/Vallecitos	Liv	1.12	I	East	1	6	31.8	B	INRIX XD	3614	15.8	E
A144	SR 84 - WB	Isabel/Vallecitos	Ruby Hill /Kaithoff	Liv	0.38	I	East	1	6	49.5	A	INRIX XD	3704	34.7	B
A145	SR 84 - WB	Ruby Hill /Kaithoff	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.63	55.8	East	2	6	24.8	F	INRIX XD	3701	29.3	E
A146	SR 84 - WB	Culvert (Lat/Long: 37.613854,-121.817224)	Vallecitos Nuc.Cntr	Uninc	1.65	56.5	East	1	6	37.3	D	INRIX XD	3704	37.4	D
A147	SR 84 - WB	Vallecitos Nuc.Cntr	Vallecitos Ln	Uninc	1.14	52.5	South	1	6	47.4	A	INRIX XD	3691	54.1	A
A148	SR 84 - WB	Vallecitos Ln	SR 84/I-680 On	Uninc	0.86	55.3	South	1	6	33.5	C	INRIX XD	2479	43.6	C
A149	SR 84 - WB	SR 84/I-680 On	Ple-Sunol Rd	Uninc	0.62	41.4	South	1	6	38.0	B	INRIX XD	2453	35.1	B
A150	SR 84 - WB	Ple-Sunol Rd	Sunol Rd	Fre	0.55	41.9	South	1	6	46.1	A	INRIX XD	2578	42.7	A
A151	SR 84 - WB	Sunol Rd	Niles Canyon Quarry	Fre	1.74	48.5	South	1	6	33.6	D	INRIX XD	3070	46.3	A
A152	SR 84 - WB	Niles Cyn Quarry	E Fremont City Limit	Fre	1.00	47.5	South	1	6	22.8	F	INRIX XD	3039	42.7	B
A153	SR 84 - WB	E Fremont City Limit	Union City Limit	Fre	2.03	41.8	South	1	6	42.6	A	INRIX XD	3073	39.6	A
A154	SR 84 - WB	Union City Limit	SR 238	Fre	1.35	31.7	South	1	6	54.7	A	INRIX XD	3059	33.3	A
A155	SR 92 - EB	I-880	Mission	Hay	1.71	II	Central	3	6	21.6	C	INRIX	2878	24.5	B
A156	SR 92 - WB	Mission	I-880	Hay	1.71	II	Central	3	6	19.5	C	INRIX	3684	22.3	C
A157	SR 112 (Davis) - EB	Doolittle	I-880	San L	0.52	II	Central	2	6	13.5	E	INRIX	2931	18.9	C
A158	SR 112 (Davis) - EB	I-880	San Leandro	San L	0.99	II	Central	2	6	18.1	C	INRIX	2632	17.2	D
A159	SR 112 (Davis) - EB	San Leandro	14th	San L	0.28	III	Central	2	6	11.3	D	INRIX	2037	14.6	C
A160	SR 112 (Davis) - WB	E 14th	San Leandro	San L	0.28	III	Central	2	6	10.1	D	INRIX	2935	12.3	D
A161	SR 112 (Davis) - WB	San Leandro	I-880	San L	0.99	II	Central	2	6	18.4	C	INRIX	3524	17.8	D
A162	SR 112 (Davis) - WB	I-880	Doolittle	San L	0.52	II	Central	2	6	19.7	C	INRIX	3611	16.9	D
A163	SR 123 San Pablo - SB	Carlson	Washington	Alb	0.51	II	North	2	6	19.2	C	INRIX	3170	17.9	D
A164	SR 123 San Pablo - SB	Washington	Marin	Alb	0.36	III	North	2	6	12.0	D	INRIX	2963	17.2	C
A165	SR 123 San Pablo - SB	Marin	Gilman	Alb - Berk	0.45	II	North	2	6	23.4	C	INRIX	3321	17.1	D
A166	SR 123 San Pablo - SB	Gilman	University	Berk	0.81	II	North	2	6	14.7	D	INRIX	2996	17.6	D
A167	SR 123 San Pablo - SB	University	Allston	Berk	0.19	III	North	2	6	10.4	D	INRIX	3017	20.6	B
A168	SR 123 San Pablo - SB	Allston	Dwight	Berk	0.38	II	North	2	6	20.1	C	INRIX	3017	20.6	C
A169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	0.64	II	North	2	6	20.6	C	INRIX	2543	19.8	C
A170	SR 123 San Pablo - SB	Ashby	Stanford	Oak	0.80	II	North	2	6	16.1	D	INRIX	2875	19.0	C
A171	SR 123 San Pablo - SB	Stanford	53rd	Oak	0.27	II	North	2	6	18.2	C	INRIX	2965	17.3	D
A172	SR 123 San Pablo - SB	53rd	Park	Emery	0.34	II	North	2	6	16.7	D	INRIX	2965	17.3	D

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A173	SR 123 San Pablo - SB	Park	35th	Emery - Oak	0.44	II	North	2	6	13.4	E	INRIX	1512	17.8	D
A174	SR 123 San Pablo - NB	35th	Park	Oak - Emery	0.42	II	North	2	6	18.6	C	INRIX	1095	16.4	D
A175	SR 123 San Pablo - NB	Park	53rd	Emery	0.34	II	North	2	6	24.8	B	INRIX	3471	18.7	C
A176	SR 123 San Pablo - NB	53rd	Stanford	Oak	0.27	II	North	2	6	23.0	C	INRIX	3471	18.7	C
A177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	0.80	II	North	2	6	15.5	D	INRIX	3076	15.6	D
A178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	0.64	II	North	2	6	22.4	C	INRIX	1556	22.1	C
A179	SR 123 San Pablo - NB	Dwight	Allston	Berk	0.38	II	North	2	6	26.4	B	INRIX	2167	18.9	C
A180	SR 123 San Pablo - NB	Allston	University	Berk	0.19	III	North	2	6	12.7	D	INRIX	2167	18.9	C
A181	SR 123 San Pablo - NB	University	Gilman	Berk	0.81	II	North	2	6	21.5	C	INRIX	1407	17.9	D
A182	SR 123 San Pablo - NB	Gilman	Marin	Alb - Berk	0.45	II	North	2	6	22.1	C	INRIX	2249	17.9	D
A183	SR 123 San Pablo - NB	Marin	Washington	Alb	0.36	III	North	2	6	13.0	C	INRIX	1562	18.7	C
A184	SR 123 San Pablo - NB	Washington	Carlson	Alb	0.51	II	North	2	6	22.5	C	INRIX	2143	19.7	C
A185	SR 185 (International Blvd) - SB	42nd	46th St	Oak	0.29	II	North	2	6	19.4	C	INRIX	585	17.5	D
A186	SR 185 (International Blvd) - SB	46th St	Seminary	Oak	0.78	II	North	2	6	24.2	B	INRIX	1326	20.7	C
A187	SR 185 (International Blvd) - SB	Seminary	73rd	Oak	0.80	II	North	2	6	16.9	D	INRIX	897	13.1	E
A188	SR 185 (International Blvd) - SB	73rd Ave	98th Ave	Oak	1.41	II	North	2	6	22.1	C	INRIX	337	18.0	C
A189	SR 185 (International Blvd) - SB	98th	Broadmoor	Oak	0.75	II	North	2	6	19.3	C	INRIX	1131	19.3	C
A190	SR 185 (14th) - SB	Broadmoor	Davis	San L	0.73	II	Central	2	6	21.2	C	INRIX	2222	19.3	C
A191	SR 185 (14th) - SB	Davis	San Leandro	San L	1.06	III	Central	2	6	22.2	B	INRIX	1530	19.1	B
A192	SR 185 (14th) - SB	San L Blvd	Hesperian	San L	0.94	II	Central	2	6	20.8	C	INRIX	2278	21.8	C
A193	SR 185 (14th) - SB	Hesperian	Bayfair	San L	0.47	II	Central	2	6	18.4	C	INRIX	862	19.8	C
A194	SR 185 (14th) - SB	Bayfair	170th	Uninc	1.19	II	South	2	6	17.5	D	INRIX	573	20.0	C
A195	SR 185 (14th) - SB	170th	Llewelling	Uninc	0.20	II	South	2	6	17.4	D	INRIX	2359	21.3	C
A196	SR 185 (14th) - SB	Llewelling	Sunset	Uninc	1.05	II	South	2	6	16.7	D	INRIX	1516	20.3	C
A197	SR 185 Hayward - SB	Sunset	SR 92/238	Hay	0.84	III	Central	2	6	11.9	D	INRIX	2996	16.7	C
A198	SR 185 Hayward - NB	A Street (SR 92/238 until 2012)	Sunset	Hay	0.43	III	Central	2	6	26.8	A	INRIX	1390	20.4	B
A199	SR 185 (14th) - NB	Sunset	Llewelling	Uninc	1.05	II	South	2	6	22.5	C	INRIX	685	23.2	C
A200	SR 185 (14th) - NB	Llewelling	170th	Uninc	0.20	II	South	2	6	32.3	A	INRIX	1752	25.2	B

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A201	SR 185 (14th) - NB	170th	Bayfair	Uninc	1.19	II	South	2	6	19.7	C	INRIX	1386	19.8	C
A202	SR 185 (14th) - NB	Bayfair	Hesperian	San L	0.47	II	Central	2	6	23.1	C	INRIX	1633	20.1	C
A203	SR 185 (14th) - NB	Hesperian	San L Blvd	San L	0.94	II	Central	2	6	17.1	D	INRIX	2986	19.6	C
A204	SR 185 (14th) - NB	San Leandro	Davis	San L	1.06	III	Central	1	6	14.2	C	INRIX	1617	15.4	C
A205	SR 185 (14th) - NB	Davis	Broadmoor	San L	0.73	II	Central	2	6	21.2	C	INRIX	2323	19.9	C
A206	SR 185 (International Blvd) - NB	Broadmoor	98th	Oak	0.75	II	North	2	6	15.3	D	INRIX	673	15.9	D
A207	SR 185 (International Blvd) - NB	98th Ave	73rd Ave	Oak	1.41	II	North	2	6	17.3	D	INRIX	1050	15.1	D
A208	SR 185 (International Blvd) - NB	73rd Ave	Seminary	Oak	0.80	II	North	2	6	11.6	E	INRIX	1134	13.8	E
A209	SR 185 (International Blvd) - NB	Seminary	46th St	Oak	0.78	II	North	2	6	16.6	D	INRIX	2245	16.6	D
A210	SR 185 (International Blvd) - NB	46th St	42nd	Oak	0.29	II	North	2	6	6.7	F	INRIX	1453	14.2	D
A211	SR 238 (Foothill) - NB	Jackson	City Center	Hay	0.63	III	Central	4	6	24.4	B	INRIX	3640	17.7	C
A212	SR 238 (Foothill) - NB	City Center	I-580	Hay	0.73	II	South	3	6	30.9	A	INRIX	3167	25.5	B
A213	SR 238 (Foothill) - NB	I-580 Ramp	I-580 Merge	Uninc	0.68	I	South	1	6	44.6	A	Floating Car	6	49.5	A
A214	SR 238 (Foothill) - SB	I-580	Cstro V Blvd	Uninc	0.73	I	South	3	6	37.2	A	Floating Car	6	32.9	B
A215	SR 238 (Foothill) - SB	Cstro V Blvd	City Center	Hay-Uninc	1.04	II	Central	3	6	28.1	B	INRIX	3477	21.1	C
A216	SR 238 (Foothill) - SB	City Center	A Street	Hay	0.16	III	Central	3	6	9.1	D	INRIX	3576	18.6	C
A217	SR 238 (Mission) - NB	680 NB Rmp	Stevenson	Fre	2.35	I	South	2	6	34.6	B	INRIX	2228	31.7	B
A218	SR 238 (Mission) - NB	Stevenson	Nursery	Fre	2.43	I	South	2	6	30.7	B	INRIX	2926	32.1	B
A219	SR 238 (Mission) - NB	Nursery	Tamarack	Uni Cty	2.63	I	South	3	6	32.8	B	INRIX	3021	34.6	B
A220	SR 238 (Mission) - NB	Tamarack	Industrial	Uni Cty - Hay	1.96	I	South	3	6	29.8	B	INRIX	3692	28.0	B
A221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	1.46	II	Central	2	6	24.0	B	INRIX	3685	25.6	B
A222	SR 238 (Mission) - NB	Sorenson	Jackson	Hay	1.83	II	Central	2	6	19.1	C	INRIX	3652	23.7	C
A223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	1.83	II	Central	2	6	23.8	C	INRIX	3621	24.1	B
A224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	1.46	II	Central	2	6	21.3	C	INRIX	3706	22.6	C
A225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay - Uni Cty	1.96	I	Central	3	6	24.8	C	INRIX	3706	20.7	D
A226	SR 238 (Mission) - SB	Tamarack	Nursery	Uni Cty	2.63	I	South	3	6	22.6	C	INRIX	3630	26.0	C
A227	SR 238 (Mission) - SB	Nursery	Stevenson	Fre	2.43	I	South	2	6	17.6	D	INRIX	3675	25.7	C
A228	SR 238 (Mission) - SB	Stevenson	680 NB Rmp	Fre	2.35	I	South	2	6	24.7	C	INRIX	3098	27.7	C
A229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	1.35	I	North	2	6	9.1	D	INRIX	2702	16.6	E

Table B-7: 2018 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Arterial Class	Plan Area	# Lanes	2016 Results				2018 Results		
		From	To						# Runs	Speed	LOS	Method	Sample	Speed	LOS
A230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	1.43	I	North	2	6	31.4	A	INRIX	300	33.9	B
A231	SR 262 (Mission) - EB	I-880 NB	I-680 NB	Fre	1.48	I	South	2	6	33.0	B	INRIX	3699	31.7	B
A232	SR 262 (Mission) - WB	I-680 NB	I-880 SB	Fre	1.67	I	South	2	6	23.6	C	INRIX	3703	32.1	B
A233	SR 84 (Liv) - NB - realign	Airway	I-580 WB (off)	Liv	0.52	I	East	3	6	30.6	B	INRIX XD	3385	35.0	B
A234	SR 84 (Liv) - SB - realign	I-580 WB (off)	Airway)	Liv	0.53	I	East	3	6	11.8	F	INRIX XD	3263	25.0	C

B.8 | Arterials (Tier 2) - PM Peak Period (INRIX data)

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	2016 results			2018 Results		
										Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T1	W.Grand Ave - Grand Ave -EB	I-80/Maritime St	San Pablo Ave	Oak	1.63	North	26.6	2	3	696	19.4	C/C	776	19.7	C/C
T2	W.Grand Ave - Grand Ave -EB	San Pablo Ave	Broadway	Oak	0.4	North	19.9	3	4	1684	12.2	D/D	1845	12.0	D/D
T3	W.Grand Ave - Grand Ave -EB	Broadway	I-580	Oak	1.08	North	21.6	3	4	809	11.4	D/D	1647	12.1	D/D
T4	W.Grand Ave - Grand Ave -WB	I-580	Broadway	Oak	1.08	North	21.5	3	4	505	14.0	C/C	814	14.8	C/C
T5	W.Grand Ave - Grand Ave -WB	Broadway	San Pablo Ave	Oak	0.4	North	20.8	3	4	1506	11.2	D/D	2206	13.0	C/D
T6	W.Grand Ave - Grand Ave -WB	San Pablo Ave	I-80/Maritime St	Oak	1.63	North	28.3	2	3	1042	22.2	C/C	2394	26.8	B/B
T7	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	I-980 ON Ramp/Brush St	Webster	Oak	0.6	North	14.4	3	4	6	15.5	C/C	Commercial Data Not Available		
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	Webster	East side of Lake Merritt Channel	Oak	0.66	North	14.7	3	4	6	11.9	D/D	Commercial Data Not Available		
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	1.15	North	16.7	3	4	6	13.6	C/C	1255	13.0	C/D
T10	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	MacArthur Blvd/I-580 ON Ramp	East side of Lake Merritt Channel	Oak	1.15	North	16.8	3	4	6	16.1	C/C	758	15.0	C/C
T11	12th St - Lake Merritt	East side of Lake	Webster	Oak	0.64	North	15.9	3	4	6	11.9	D/D	Commercial Data Not		

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
	Blvd - Lakeshore Ave-WB	Merritt Channel											Available		
T12	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oak	0.6	North	17.4	3	4	6	10.066	D/D	Commercial Data Not Available		
T13	Telegraph Ave-NB	51st Street	Russell St	Oak - Berk	1.41	North	15.0	3	4	6	12.1	D/D	1392	15.1	C/C
T14	Telegraph Ave-NB	Russell St	Bancroft Way	Berk	0.77	North	13.5	3	4	6	13.5	C/C	948	12.9	D/D
T15	Dana-Dwight-Telegraph-SB	Bancroft Way	Russell St	Berk	0.9	North	13.9	3	4	6	15.0	C/C	Commercial Data Not Available		
T16	Telegraph Ave-SB	Russell St	51st Street	Oak - Berk	1.41	North	18.5	3	4	6	13.5	C/C	1205	16.4	C/C
T17	Broadway-SB	Broadway/College Ave	Grand Ave	Oak	1.91	North	20.8	2	3	718	13.6	E/E	1547	11.9	E/E
T18	Broadway-SB	Grand Ave	14th St	Oak	0.55	North	18.2	3	4	1039	11.0	D/D	1654	10.1	D/D
T19	Broadway-SB	14th St	5th St/Broadway	Oak	0.48	North	17.9	3	4	1505	8.1	E/E	2496	7.3	E/E
T20	Broadway (Connection to I-880)-SB	5th St/Broadway	I-880 ON Ramp	Oak	0.21	North	62.9	1	1	6	16.4	E/E	Commercial Data Not Available		
T21	Broadway (Connection to I-880)-NB	I-880 OFF Ramp	5th St/Broadway	Oak	1.26	North	23.0	1	2	6	13.6	E/F	Commercial Data Not Available		
T22	Broadway-NB	5th St/Broadway	14th St	Oak	0.48	North	17.1	3	4	658	8.7	E/E	631	8.5	E/E
T23	Broadway-NB	14th St	Grand Ave	Oak	0.55	North	18.3	3	4	974	11.1	D/D	1411	11.1	D/D
T24	Broadway-NB	Grand Ave	Broadway/College Ave	Oak	1.91	North	21.9	2	3	1257	12.6	E/E	2357	12.6	E/E
T25	Durant-EB	Shattuck	College Ave.	Berk	0.73	North	16.0	3	4	6	16.5	C/C	Commercial Data Not Available		
T26	College Avenue-SB	Bancroft Way/College Ave	Ashby Ave	Berk	0.85	North	16.8	3	4	1224	8.9	E/E	1704	9.1	D/D
T27	College Avenue-SB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oak - Berk	0.83	North	19.7	3	4	674	10.2	D/D	1513	11.6	D/D
T28	College Avenue-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Oak	0.61	North	16.7	3	4	953	11.9	D/D	2378	12.5	D/D
T29	College Avenue-NB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Oak	0.61	North	17.0	3	4	1063	10.8	D/D	2101	11.5	D/D
T30	College Avenue-NB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oak - Berk	0.83	North	18.3	3	4	518	10.0	D/D	1417	9.4	D/D
T31	College Avenue-NB	Ashby Ave	Bancroft	Berk	0.85	North	16.8	3	4	1049	10.5	D/D	1658	11.2	D/D

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	2016 results			2018 Results		
										Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
			Way/College Ave												
T32	Bancroft-WB	College Ave.	Shattuck	Berk	0.73	North	12.5	3	4	6	11.4	D/D	482	10.8	D/D
T33	51st Street-EB	SR 24 Off Ramp/52nd St	Broadway	Oak	0.75	North	15.0	3	4	6	13.0	C/C	2981	14.5	C/C
T34	51st Street-WB	Broadway	SR 24 Off Ramp/52nd St	Oak	0.75	North	15.7	3	4	6	14.3	C/C	694	17.4	C/C
T35	Shattuck Avenue-NB	51st	Alcatraz Ave.	Oak - Berk	0.81	North	22.8	3	4	6	16.4	C/C	3062	16.4	C/C
T36	Shattuck Avenue-NB	Alcatraz Ave.	Adeline St.	Berk	0.7	North	16.7	3	4	6	12.1	D/D	2479	13.6	C/C
T37	Shattuck Avenue-SB	Adeline St.	Alcatraz Ave.	Berk	0.7	North	17.1	3	4	6	11.6	D/D	2454	10.5	D/D
T38	Shattuck Avenue-SB	Alcatraz Ave.	51st	Oak	0.81	North	17.3	3	4	6	15.8	C/C	3134	17.3	C/C
T39	Powell Street-Stanford Avenue-EB	NB I-80 OFF Ramp	San Pablo Ave	Emery	0.75	North	15.5	2	3	6	16.1	D/D	Commercial Data Not Available		
T40	Powell Street-Stanford Avenue-EB	San Pablo Ave	MLK Jr Way	Oak - Berk	0.76	North	17.0	2	3	6	19.0	C/C	Commercial Data Not Available		
T41	Powell Street-Stanford Avenue-WB	MLK Jr Way	San Pablo Ave	Oak - Berk	0.76	North	19.1	2	3	6	18.5	C/C	Commercial Data Not Available		
T42	Powell Street-Stanford Avenue-WB	San Pablo Ave	NB I-80 OFF Ramp	Emery - Oak	0.75	North	15.3	2	3	6	13.8	E/E	2181	15.1	D/D
T43	40thStreet-Shellmound Avenue-EB	Shellmound Way (north of Powell St)	40th St	Emery	0.73	North	24.6	2	3	6	20.9	C/C	Commercial Data Not Available		
T44	40thStreet-Shellmound Avenue-EB	40th St	San Pablo Ave	Emery	0.68	North	16.5	3	4	6	13.4	C/C	1142	11.6	D/D
T45	40thStreet-Shellmound Avenue-WB	San Pablo Ave	40th St	Emery	0.68	North	22.0	3	4	6	18.8	C/C	658	16.6	C/C
T46	40thStreet-Shellmound Avenue-WB	40th St	Shellmound Way (north of Powell St)	Emery	0.73	North	29.0	2	3	6	25.4	B/B	Commercial Data Not Available		
T47	International Boulevard-NB	42nd Ave	Fruitvale Ave	Oak	0.62	North	21.9	3	4	1329	12.2	D/D	1240	12.2	D/D
T48	International Boulevard-NB	Fruitvale Ave	14th Ave	Oak	1.38	North	22.9	3	4	630	18.7	C/C	470	18.2	C/C
T49	International Boulevard-NB	14th Ave	Lake Merritt Blvd	Oak	0.88	North	22.5	3	4	475	18.1	C/C	364	18.1	C/C
T50	International Boulevard-SB	Lake Merritt Blvd	14th Ave	Oak	0.88	North	21.5	3	4	2011	17.4	C/C	780	18.5	C/C
T51	International Boulevard-SB	14th Ave	Fruitvale Ave	Oak	1.38	North	22.9	3	4	2459	17.3	C/C	1061	17.7	C/C
T52	International	Fruitvale Ave	42nd Ave	Oak	0.62	North	21.4	3	4	2863	8.4	E/E	1503	9.0	D/E

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
	Boulevard-SB														
T53	73d Ave-NB	International Blvd/73rd Ave	73rd Ave/Foothill Blvd	Oak	1.07	North	28.1	2	3	1935	19.1	C/C	2317	19.1	C/C
T54	Foothill Boulevard-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oak	1.02	North	20.3	3	4	52	20.2	B/B	153	17.4	C/C
T55	Foothill Boulevard-NB	Seminary Ave	High Street	Oak	1.22	North	21.5	3	4	748	18.1	C/C	370	18.2	C/C
T56	Foothill Boulevard-NB	High Street	Fruitvale Ave	Oak	0.9	North	19.8	3	4	517	11.1	D/D	152	10.0	D/D
T57	Foothill Boulevard-NB	Fruitvale Ave	14th Ave	Oak	1.32	North	22.9	2	3	692	16.1	D/D	369	18.5	C/C
T58	Foothill Boulevard-NB	14th Ave	1st Ave/Lake Shore Blvd	Oak	0.88	North	20.5	3	4	177	14.7	C/C	54	17.8	C/C
T60	Foothill Boulevard-SB	14th Ave	Fruitvale Ave	Oak	1.32	North	21.8	2	3	844	15.2	D/D	284	15.8	D/D
T61	Foothill Boulevard-SB	Fruitvale Ave	High Street	Oak	0.9	North	20.8	3	4	778	11.1	D/D	247	9.6	D/D
T62	Foothill Boulevard-SB	High Street	Seminary Ave	Oak	1.22	North	20.2	3	4	1340	18.2	C/C	575	17.5	C/C
T63	Foothill Boulevard-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	1.02	North	21.2	3	4	772	16.4	C/C	276	12.9	D/D
T64	73d Ave-SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oak	1.07	North	26.9	2	3	1569	20.1	C/C	1494	20.2	C/C
T65	E. 15th Street-SB/14th Avenue	1st Avenue	Foothill Blvd/14th Avenue	Oak	0.98	North	14.8	3	4	6	17.8	C/C	Commercial Data Not Available		
T66	High Street-EB	Otis Drive	Central Ave	Ala	0.58	North	19.7	3	4	162	20.2	B/B	505	19.2	B/B
T67	High Street-EB	Central Ave	Fernside Blvd	Ala	0.48	North	19.3	3	4	758	17.4	C/C	1695	16.3	C/C
T68	High Street-EB	Fernside Blvd	NB I-880 OFF Ramp	Ala - Oak	0.5	North	14.8	2	3	310	12.0	E/E	576	10.9	E/E
T69	High Street-EB	NB I-880 OFF Ramp	Foothill Blvd	Oak	0.61	North	16.3	3	4	577	11.3	D/D	945	10.6	D/D
T70	High Street-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oak	1.29	North	20.9	3	4	614	17.6	C/C	1049	18.8	C/C
T71	High Street-WB	MacArthur Blvd/WB I-580 OFF Ramp	Foothill Blvd	Oak	1.29	North	21.2	3	4	440	20.3	B/B	707	18.3	C/C
T72	High Street-WB	Foothill Blvd	NB I-880 OFF Ramp	Oak	0.61	North	16.9	3	4	593	11.5	D/D	1029	10.2	D/D
T73	High Street-WB	NB I-880 OFF Ramp	Fernside Blvd	Ala - Oak	0.5	North	21.6	2	3	609	17.3	D/D	2068	17.3	D/D
T74	High Street-WB	Fernside Blvd	Central Ave	Ala	0.48	North	16.8	3	4	1018	19.5	B/B	2420	18.5	C/C
T75	High Street-WB	Central Ave	Otis Drive	Ala	0.58	North	24.5	3	4	542	17.8	C/C	1301	16.8	C/C
T76	Crow Canyon Road/Grove Way-NB	A Street/Redwood Road	EB I-580 ON Ramp/Grove Way	Uninc	0.95	Central	29.0	2	3	1638	18.6	C/C	2008	18.2	C/C
T77	Crow Canyon Road/Grove Way-NB	EB I-580 ON Ramp/Grove Way	Cull Canyon	Uninc	0.81	Central	32.1	1	2	3078	23.1	C/C	3659	22.7	C/C
T78	Crow Canyon Road-NB	Cull Canyon	Cold Water Dr	Uninc	0.88	Central	42.3	1	2	3197	38.4	A/A	3675	36.7	A/A

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T79	Crow Canyon Road-NB	Cold Water Dr	0.43 miles north of Norris Canyon Rd	Uninc	2.41	Central	42.0	Rural	Rural	3546	38.2	A/-	3706	36.5	B/-
T80	Crow Canyon Road-NB	0.43 miles north of Norris Canyon Rd	County Line	Uninc	2.97	Central	42.0	Rural	Rural	3546	38.2	A/-	3706	36.5	B/-
T81	Crow Canyon Road-SB	County Line	0.43 miles north of Norris Canyon Rd	Uninc	2.97	Central	41.4	Rural	Rural	3536	38.1	A/-	3706	37.2	B/-
T82	Crow Canyon Road-SB	0.43 miles north of Norris Canyon Rd	Cold Water Dr	Uninc	2.4	Central	41.4	Rural	Rural	3536	38.1	A/-	3706	37.2	B/-
T83	Crow Canyon Road-SB	Cold Water Dr	Cull Canyon	Uninc	0.89	Central	41.6	1	2	2512	36.2	A/A	2981	35.9	A/A
T84	Crow Canyon Road/Grove Way-SB	Cull Canyon	EB I-580 ON Ramp/Grove Way	Uninc	0.82	Central	36.1	1	2	1475	23.7	C/C	2335	25.3	C/C
T85	Crow Canyon Road/Grove Way-SB	EB I-580 ON Ramp/Grove Way	A Street/Redwood Road	Uninc	0.94	Central	30.7	2	3	487	23.9	C/C	935	23.2	C/C
T86	Winton Avenue - D Street-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hay	0.39	Central	25.7	2	3	3533	16.5	D/D	3695	14.7	D/D
T87	Winton Avenue - D Street-EB	SB I-880 ON Ramp	Santa Clara St	Hay	0.35	Central	33.5	2	3	3447	19.3	C/C	3599	18.8	C/C
T88	Winton Avenue - D Street-EB	Santa Clara St	Soto Rd	Hay	0.55	Central	24.1	2	3	3505	14.9	D/D	3666	16.7	D/D
T89	Winton Avenue - D Street-EB	Soto Rd	Foothill Boulevard/D St	Hay	0.92	Central	24.5	2	3	2382	12.9	E/E	2803	13.0	E/E
T90	Winton Avenue - D Street-WB	Foothill Boulevard/D St	Soto Rd	Hay	0.92	Central	27.2	2	3	948	17.6	D/D	864	17.7	D/D
T91	Winton Avenue - D Street-WB	Soto Rd	Santa Clara St	Hay	0.55	Central	23.0	2	3	3155	18.4	C/C	2572	16.3	D/D
T92	Winton Avenue - D Street-WB	Santa Clara St	SB I-880 ON Ramp	Hay	0.35	Central	34.7	2	3	2717	29.5	B/B	2510	30.2	A/A
T93	Winton Avenue - D Street-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hay	0.39	Central	24.1	2	3	3474	18.5	C/C	3693	19.3	C/C
T94	A Street-EB	Foothill Boulevard/A St	Redwood Rd/Grove Way	Hay - Uninc	0.8	Central	23.6	2	3	3202	19.9	C/C	3483	19.0	C/C
T95	A Street-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Uninc	0.42	Central	18.5	2	3	2684	20.2	C/C	3293	19.2	C/C
T96	A Street-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Uninc	0.42	Central	28.8	2	3	2627	21.0	C/C	3223	20.1	C/C
T97	A Street-WB	Redwood Rd/Grove Way	Foothill Boulevard/A St	Uninc	0.8	Central	15.8	2	3	2634	19.5	C/C	3174	19.1	C/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T98	Hesperian Boulevard-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Uni Cty	0.98	South	26.5	1	2	3085	12.9	F/F	3590	12.3	F/F
T99	Hesperian Boulevard-Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	0.3	South	32.9	1	2	3315	12.5	F/F	3706	11.9	F/F
T100	Hesperian Boulevard-Union City Blvd-NB	Hesperian/Union City Blvd/overbridge	Industrial Blvd	Hay	0.57	South	26.4	1	2	3178	13.7	E/E	3702	14.3	E/E
T101	Hesperian Boulevard-Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Hay	1.05	South	25.2	2	3	3473	25.3	B/B	3526	23.8	C/C
T102	Hesperian Boulevard-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Hay	1.05	South	26.8	2	3	2555	24.9	B/B	2744	23.0	C/C
T103	Hesperian Boulevard-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Hay	0.57	South	19.3	1	2	1034	21.0	D/D	757	21.2	D/D
T104	Hesperian Boulevard-Union City Blvd-SB	Hesperian/Union City Blvd/overbridge	Whipple Rd	Uni Cty	0.3	South	22.1	1	2	3196	24.1	C/C	3546	23.8	C/C
T105	Hesperian Boulevard-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Uni Cty	0.98	South	29.5	1	2	1504	24.0	C/C	2565	24.2	C/C
T106	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Fre	0.22	South	30.6	1	2	2640	26.9	C/C	3394	26.0	C/C
T107	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Uni Cty - Fre	1.42	South	32.4	1	2	520	25.3	C/C	2528	22.7	C/C
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Uni Cty	0.51	South	28.5	1	2	183	18.5	D/D	2536	19.9	D/D
T109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Uni Cty	0.51	South	28.1	1	2	1740	17.2	D/D	2103	17.3	D/D
T110	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Uni Cty - Fre	1.42	South	31.2	1	2	1457	24.3	C/C	1879	22.9	C/C
T111	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Fre	0.22	South	31.6	1	2	2001	22.3	C/C	2979	24.6	C/C
T112	Fremont Boulevard-NB	NB I-880 OFF Ramp	Automall Parkway	Fre	1.28	South	34.7	1	2	2723	21.8	D/D	3309	20.7	D/D
T113	Fremont Boulevard-NB	Automall Parkway	Blacow Rd	Fre	0.91	South	34.2	1	2	3293	28.3	B/B	3576	31.2	B/B
T114	Fremont Boulevard-NB	Blacow Rd	Adams Ave	Fre	0.38	South	28.0	1	2	3515	19.8	D/D	3653	24.5	C/C
T115	Fremont Boulevard-NB	Adams Ave	Stevenson Rd	Fre	1.17	South	27.9	2	3	2507	19.7	C/C	3306	24.6	B/B
T116	Fremont Boulevard-NB	Stevenson Rd	Mowry Ave	Fre	1	South	30.2	2	3	1643	23.4	C/C	2692	24.4	B/B
T117	Fremont Boulevard-NB	Mowry Ave	Peralta Blvd	Fre	1.21	South	30.0	2	3	2174	21.0	C/C	2911	23.2	C/C
T118	Fremont Boulevard-NB	Peralta Blvd	Thornton Ave	Fre	0.33	South	30.9	2	3	2488	15.7	D/D	2731	15.0	D/D
T119	Fremont Boulevard-NB	Thornton Ave	Decoto Rd	Fre	1.33	South	32.0	1	2	2325	22.7	C/C	3075	25.8	C/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T120	Fremont Boulevard-NB	Decoto Rd	Paseo Padre Pkwy	Fre	0.56	South	31.0	1	2	2511	22.4	C/C	3185	23.5	C/C
T121	Fremont Boulevard-NB	Paseo Padre Pkwy	NB I-880 OFF Ramp	Fre	0.39	South	31.0	1	2	2165	25.0	C/C	3068	24.2	C/C
T122	Fremont Boulevard-SB	NB I-880 OFF Ramp	Paseo Padre Pkwy	Fre	0.39	South	32.0	1	2	1316	24.5	C/C	2206	22.9	C/C
T123	Fremont Boulevard-SB	Paseo Padre Pkwy	Decoto Rd	Fre	0.56	South	29.7	1	2	1230	24.4	C/C	1709	24.7	C/C
T124	Fremont Boulevard-SB	Decoto Rd	Thornton Ave	Fre	1.33	South	30.2	1	2	1589	24.1	C/C	2060	24.7	C/C
T125	Fremont Boulevard-SB	Thornton Ave	Peralta Blvd	Fre	0.32	South	29.3	2	3	2544	17.0	D/D	3003	17.1	D/D
T126	Fremont Boulevard-SB	Peralta Blvd	Mowry Ave	Fre	1.21	South	29.4	2	3	1543	23.8	C/C	2002	22.8	C/C
T127	Fremont Boulevard-SB	Mowry Ave	Stevenson Rd	Fre	1	South	32.3	2	3	1227	24.5	B/B	1593	23.7	C/C
T128	Fremont Boulevard-SB	Stevenson Rd	Adams Ave	Fre	1.17	South	27.8	2	3	2216	22.1	C/C	1705	22.3	C/C
T129	Fremont Boulevard-SB	Adams Ave	Blacow Rd	Fre	0.38	South	27.9	1	2	3480	22.3	C/C	2376	21.9	D/D
T130	Fremont Boulevard-SB	Blacow Rd	Automall Parkway	Fre	0.91	South	33.1	1	2	1462	29.2	B/B	1994	27.1	C/C
T131	Fremont Boulevard-SB	Automall Parkway	NB I-880 OFF Ramp	Fre	1.28	South	34.9	1	2	738	30.0	B/B	1407	27.6	C/C
T132	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fre	0.85	South	23.1	1	2	6	25.8	C/C	3668	23.8	C/C
T133	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fre	0.74	South	29.5	1	2	6	24.6	C/C	3634	13.1	E/E
T134	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fre	0.75	South	21.1	1	2	6	20.3	D/D	2735	21.5	D/D
T135	Automall Parkway-WB	Fremont Blvd	NB I-880 OFF Ramp	Fre	0.85	South	27.1	1	2	6	25.5	C/C	3443	24.5	C/C
T136	Vasco Road-NB	WB I-580 OFF Ramp	Scenic Ave	Liv	0.44	East	36.3	1	2	3168	15.4	E/E	3599	9.0	F/F
T137	Vasco Road-NB	Scenic Ave	Dalton Ave/City-County Line	Liv	0.68	East	37.4	1	2	3255	14.6	E/E	3705	8.1	F/F
T138	Vasco Road-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Liv	3.11	East	53.0	Rural	Rural	3320	34.2	D/-	3700	40.6	C/-
T139	Vasco Road-NB	N. Vasco Rd/Vasco Rd	Local Road underpass/County Line	Liv	2.25	East	53.0	Rural	Rural	3320	34.2	D/-	3700	40.6	C/-
T140	Vasco Road-SB	Local Road underpass/County Line	N. Vasco Rd/Vasco Rd	Liv	2.25	East	46.8	Rural	Rural	3132	57.1	A/-	3438	56.4	A/-
T141	Vasco Road-SB	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Liv	3.11	East	46.8	Rural	Rural	3132	57.1	A/-	3438	56.4	A/-
T142	Vasco Road-SB	Dalton Ave/City-County Line	Scenic Ave	Liv	0.68	East	34.3	1	2	3067	30.2	B/B	3393	28.4	B/B
T143	Vasco Road-SB	Scenic Ave	WB I-580 OFF Ramp	Liv	0.44	East	32.0	1	2	1616	30.9	B/B	1872	30.2	B/B
T144	Dublin Blvd.-EB	San Ramon Road	Village Parkway	Dub	0.73	East	26.5	2	3	2445	16.8	D/D	3577	15.3	D/D
T145	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dub	0.81	East	29.5	2	3	2541	22.7	C/C	3572	24.1	B/B
T146	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dub	1.21	East	34.1	1	2	2020	25.0	C/C	3705	27.6	C/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T147	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dub	0.89	East	30.2	1	2	2219	20.1	D/D	3468	21.8	D/D
T148	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dub	0.89	East	29.1	1	2	453	22.4	C/C	3523	22.4	C/C
T149	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dub	1.21	East	32.8	1	2	827	24.1	C/C	3616	26.6	C/C
T150	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dub	0.81	East	29.5	2	3	3004	21.7	C/C	3582	22.9	C/C
T151	Dublin Blvd.-WB	Village Parkway	San Ramon Road	Dub	0.73	East	24.5	2	3	1404	14.1	D/D	3122	13.8	E/E
T152	San Ramon Road-NB	WB I-580 OFF ramp	Silvergate Dr	Dub	0.64	East	30.8	1	2	1615	21.4	D/D	2976	21.9	D/D
T153	San Ramon Road-NB	Silvergate Dr	Alcosta Blvd/Westside Dr/County Line	Dub	0.99	East	35.1	1	2	2495	32.4	B/B	3503	32.4	B/B
T154	San Ramon Road-SB	Alcosta Blvd/Westside Dr/County Line	Silvergate Dr	Dub	0.99	East	35.8	1	2	2264	31.9	B/B	2978	33.0	B/B
T155	San Ramon Road-SB	Silvergate Dr	WB I-580 OFF ramp	Dub	0.64	East	32.7	1	2	1042	23.3	C/C	1660	23.1	C/C
T156	Dougherty Road-NB	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dub	1.12	East	35.4	1	2	2901	22.1	C/C	3613	22.0	C/D
T157	Dougherty Road-NB	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dub	0.8	East	44.1	1	2	2744	43.1	A/A	3609	41.6	A/A
T158	Dougherty Road-SB	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dub	0.8	East	43.1	1	2	2774	38.3	A/A	3378	30.8	B/B
T159	Dougherty Road-SB	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dub	1.12	East	33.1	1	2	2702	23.3	C/C	3537	21.2	D/D
T160	Tassajara Road-NB	WB I-580 OFF ramp	Central Parkway	Dub	0.49	East	24.7	1	2	6	13.9	E/E	Commercial Data Not Available		
T161	Tassajara Road-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dub	0.68	East	34.3	1	2	6	34.5	B/B	Commercial Data Not Available		
T162	Tassajara Road-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dub	1.04	East	38.4	1	2	6	32.4	B/B	Commercial Data Not Available		
T163	Tassajara Road-NB	Fallon Rd	County Line	Uninc	0.51	East	35.2	1	1	6	36.7	A/B	Commercial Data Not Available		
T164	Tassajara Road-SB	County Line	Fallon Rd	Uninc	0.51	East	45.2	1	1	6	40.0	A/B	Commercial Data Not Available		
T165	Tassajara Road-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dub	1.04	East	38.7	1	2	6	37.8	A/A	Commercial Data Not Available		
T166	Tassajara Road-SB	Somerset Ln/N Dublin Ranch Dr	Central Parkway	Dub	0.68	East	33.8	1	2	6	19.0	D/D	Commercial Data Not Available		
T167	Tassajara Road-SB	Central Parkway	WB I-580 OFF ramp	Dub	0.49	East	25.7	1	2	6	14.9	E/E	Commercial Data Not Available		
T168	E. Stanley Blvd -	SR 84/Isabel Ave	Murrita Blvd	Liv	0.91	East	31.5	1	2	3184	24.3	C/C	3611	26.8	C/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
	Railroad Avenue - 1st Street-NB														
T169	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	Murrita Blvd	S Livermore Ave	Liv	1.07	East	23.4	2	3	2225	21.6	C/C	2371	21.8	C/C
T170	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	S Livermore Ave	Inman St	Liv	0.46	East	21.7	2	3	404	19.0	C/C	450	17.5	D/D
T171	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Inman St	S Livermore Ave	Liv	0.46	East	20.1	2	3	99	14.6	D/D	194	13.7	E/E
T172	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	S Livermore Ave	Murrita Blvd	Liv	1.07	East	26.6	2	3	772	21.1	C/C	1020	19.5	C/C
T173	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	0.91	East	21.9	1	2	2226	35.6	A/A	2664	34.8	B/B
T174	Stoneridge Drive-EB	SB I-680 OFF Ramp	Hopyard Rd	Plea	0.93	East	33.2	1	2	3248	27.0	C/C	3697	28.6	B/B
T175	Stoneridge Drive-EB	Hopyard Rd	Hacienda Dr	Plea	0.49	East	29.8	1	2	2370	24.9	C/C	3423	28.5	B/B
T176	Stoneridge Drive-EB	Hacienda Dr	W. Las Positas Blvd	Plea	0.63	East	31.1	1	2	2917	21.9	D/D	3632	27.2	C/C
T177	Stoneridge Drive-EB	W. Las Positas Blvd	Santa Rita Road	Plea	0.44	East	30.0	1	2	1714	19.9	D/D	2947	26.7	C/C
T178	Santa Rita Road-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Plea	0.29	East	31.1	1	2	2401	29.1	B/B	3424	28.2	B/B
T179	Santa Rita Road-EB	W. Los Positas Blvd	WB I-580 OFF Ramp	Plea	0.88	East	30.3	1	2	3073	24.7	C/C	3662	24.5	C/C
T180	Santa Rita Road-WB	WB I-580 OFF Ramp	W. Los Positas Blvd	Plea	0.88	East	31.3	1	2	2450	26.1	C/C	3410	27.7	C/C
T181	Santa Rita Road-WB	W. Los Positas Blvd	Santa Rita Road	Plea	0.29	East	31.5	1	2	2823	26.8	C/C	3449	25.4	C/C
T182	Stoneridge Drive-WB	Santa Rita Road	W. Las Positas Blvd	Plea	0.44	East	31.8	1	2	430	22.4	C/C	1070	26.5	C/C
T183	Stoneridge Drive-WB	W. Las Positas Blvd	Hacienda Dr	Plea	0.63	East	33.8	1	2	2329	29.0	B/B	3308	31.4	B/B
T184	Stoneridge Drive-WB	Hacienda Dr	Hopyard Rd	Plea	0.49	East	28.8	1	2	1739	18.5	D/D	2744	22.1	C/C
T185	Stoneridge Drive-WB	Hopyard Rd	SB I-680 OFF Ramp	Plea	0.93	East	32.9	1	2	2159	25.7	C/C	3366	29.4	B/B
T186	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Plea	1.23	East	31.2	1	2	1975	26.3	C/C	2654	27.1	C/C
T187	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	0.63	East	26.1	3	4	3194	17.2	C/C	3640	17.7	C/C
T188	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Plea	0.86	East	32.1	2	3	2453	23.6	C/C	3171	23.6	C/C
T189	Sunol Blvd.- 1st Street-	Bernal Ave/Valley	SR 84/Isabel Ave	Plea - Uninc	2.98	East	44.9	1	1	3312	45.2	A/A	3675	48.9	A/A

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
	Stanley Blvd.-NB	Ave													
T190	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Plea - Uninc	2.98	East	51.0	1	1	2488	50.9	A/A	3148	51.1	A/A
T191	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Plea	0.86	East	34.6	2	3	694	26.0	B/B	1400	27.2	B/B
T192	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Plea	0.63	East	25.4	3	4	1255	18.5	C/C	2255	19.1	B/B
T193	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	Bernal Ave	NB I-680 OFF	Plea	1.23	East	35.6	1	2	1013	31.8	B/B	2417	33.2	B/B
T194	14th Avenue - EB	E 8th Street	Foothill Boulevard	Oakland	0.26	North	20.6	3	3	New Segment			1580	10.9	D/E
T195	14th Street-Lake Merritt Blvd - WB	12th Street	Bush Street	Oakland	1.13	North	16.0	3	3				212	12.8	D/E
T197	23rd Avenue - NB	23rd Ave NB/SB Split	E 11th	Oakland	0.15	North	23.3	3	3				2872	22.7	B/C
T198	23rd Avenue - SB	E 12th St	23rd Ave NB/SB Split	Oakland	0.14	North	20.6	3	3				958	19.8	B/C
T200	40th Street-Shellmound Avenue - WB	Broadway	Powell Boulevard	Emeryville	1.31	North	25.4	3	3				283	16.2	C/D
T202	52nd Street - WB	Telegraph Avenue	Shattuck	Oakland	0.11	North	57.5	3	3				1000	12.1	D/E
T208	8th Street - WB	Harrison	Broadway	Oakland	0.22	North	10.0	3	3				1643	7.2	E/F
T209	98th Avenue - EB	Airport Access Road	I-580	Oakland	3.25	North	27.8	3	3				1120	16.3	C/D
T210	Airport Access Road - NB	Dollittle Drive	Hegenberger Road	Oakland	0.32	North	25.4	3	3				937	16.6	C/D
T211	Altamont Pass Road-Grant Line - EB	Greenville Road	County Line (EB)	Alameda County	9.71	East	39.0	rural	rural				2083	30.2	C/-
T214	Alvarado-Niles/Smith/NilesBlvd - EB	Union City Boulevard	Mission Boulevard	Fremont	6.90	South	34.7	3	3				1917	22.9	B/C
T215	Auto Mall Parkway - EB	Cherry Street	I-880	Fremont	0.75	South	22.9	3	3				3652	17.0	C/D
T217	Bernal Avenue - EB	Bernal Avenue	Sunol Blvd/First St	Pleasanton	1.37	East	33.6	1	1				3369	27.7	C/C
T218	Broadway - NB	College Ave	SR24	Oakland	0.94	North	27.1	3	3				3429	19.4	B/C
T220	Buchanan Street-Marin Avenue - EB	I-80	Arlington/Del Norte	Berkeley	2.12	North	19.0	3	3				2355	15.0	C/D
T224	Casto Street - NB	7th Street	San Pablo Avenue	Oakland	0.77	North	22.1	3	3				715	17.3	C/D
T225	Castro Valley Boulevard-Mattox - EB	Mission Boulevard	Crow Canyon Road	Alameda County	2.70	Central	27.1	3	3				810	16.9	C/D
T226	Central Avenue - NB	Cherry Street	I-880	Newark	0.85	South	33.5	3	3				846	23.9	B/C
T229	Clawiter Road - SB	Winton Avenue	SR-92	Hayward	1.75	Central	30.5	3	3	New			1863	20.7	B/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T233	Dyer Street - SB	Whipple Road	Alvarado Boulevard	Union City	1.15	South	24.8	3	3	Segment			1974	21.3	B/C
T235	E 18th Street - EB	Lakeshore Avenue	Park Boulevard	Oakland	0.22	North	20.0	3	3				1560	12.1	D/E
T236	East Avenue - EB	Livermore Avenue	Vasco Road	Livermore	2.53	East	35.0	2	2				1577	29.8	B/B
T237	El Charro Road - NB	Stoneridge Drive	I-580	Pleasanton	0.26	East	22.7	2	2				2829	23.1	C/C
T238	Estudillo Avenue - EB	E 14th St	MacArthur Blvd	San Leandro	0.98	Central	23.5	3	3				1742	19.0	B/C
T241	First Street - EB	Stanley Boulevard	Railroad Avenue	Livermore	0.88	East	23.4	2	2				308	13.3	E/E
T242	Foothill Road - NB	Stoneridge Drive	I-580	Pleasanton	0.74	East	23.9	2	2				3608	19.5	C/D
T244	Fruitvale Avenue - NB	Tilden Way	MacArthur Blvd	Alameda	2.37	North	18.2	3	3				277	14.0	C/E
T245	Gilman Street - EB	I-80	San Pablo Boulevard	Berkeley	0.63	North	18.0	3	3				1564	13.6	C/E
T246	Gimmer Boulevard - SB	Paseo Padre Parkway	Mission Boulevard	Fremont	5.08	South	33.5	3	3				85	26.0	A/B
T247	Harrison St-Oakland Ave - EB	20th Street	MacArthur Blvd	Oakland	0.99	North	30.7	3	3				3036	17.2	C/D
T248	High Street - NB	I-580	MacArthur Blvd	Oakland	0.05	North	14.2	3	3				1483	7.1	E/F
T249	Industrial Blvd-Pkwy West - EB	Clawiter Road	Mission Boulevard	Hayward	5.06	Central	33.1	3	3				2557	22.1	B/C
T252	Lewelling Boulevard - EB	Hesperian Boulevard	Hespedian Boulevard	San Leandro	1.42	Central	25.4	3	3				648	16.8	C/D
T253	Lewelling Boulevard - WB	Hesperian Boulevard	Wicks Boulevard	San Leandro	1.53	Central	33.7	3	3				461	24.4	B/B
T254	Livermore Avenue - NB	Tesla Road	I-580	Livermore	3.29	East	39.6	2	2				596	22.4	C/C
T255	MacArthur-SantaClara - WB	Estudillo Avenue	Seminary Ave	San Leandro - Oak	4.36	Central - North	27.7	3	3				51	20.0	B/C
T257	Marina Boulevard - WB	Dollitle Drive	Washington Avenue	San Leandro	1.80	Central	23.5	3	3				1112	17.8	C/D
T258	Market Street - NB	55th Street	Stanford Avenue	Oakland	0.36	North	25.0	3	3				2442	14.0	C/E
T259	Martin Luther King Jr Way - NB	Marin Avenue	Adeline Street	Berkeley	2.67	North	22.1	3	3				2642	15.2	C/D
T260	Martin Luther King Jr Way - NB	San Pablo Avenue	47th Street	Oakland	1.78	North	27.0	3	3				507	16.5	C/D
T261	Mission Boulevard - SB	I-680	I-680	Fremont	3.01	South	32.2	3	3				1688	27.6	A/B
T267	Owens Drive - EB	Willow Road	W Las Positas Blvd	Pleasanton	1.10	East	26.5	2	2				2988	20.5	C/D
T268	Park Boulevard - EB	E 18th Street	SR-13	Piedmont	3.12	North	32.0	3	3				1377	21.7	B/C
T269	Park Street - NB	Otis Drive	Encinal Avenue	Alameda	0.42	North	16.0	3	3	New			1982	15.1	C/D

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T270	Paseo Padre Parkway - WB	Peralta Boulevard	Grimmer Boulevard	Fremont	2.30	South	26.8	3	3	Segment			2340	22.1	B/C
T271	Paseo Padre Parkway - EB	SR-84	Ardenwood Boulevard	Newark	1.50	South	45.6	3	3				3539	32.4	A/A
T272	Patterson Pass Road - EB	Vasco Road	County Line (EB)	Livermore	10.11	East	38.0	rural	rural				2878	37.6	A/-
T273	Redwood Road - NB	I-580	Castro Valley Boul	Alameda County	0.38	Central	25.2	3	3				2735	11.9	D/E
T274	San Leandro Blvd - EB	E 14th Street	San Leandro/Oakland	San Leandro	2.18	Central	30.7	3	3				943	20.7	B/C
T275	San Leandro Street - EB	Fruitvale Avenue	Oakland//SL border	Oakland	4.33	North	31.9	3	3				638	19.3	B/C
T278	Seminary Avenue - EB	MacArthur Boulevard	I-580	Oakland	0.67	North	24.8	3	3				2586	21.8	B/C
T281	Stevenson Boulevard - NB	Cherry Street	Mission Boulevard	Fremont	4.02	South	27.2	3	3				2495	21.4	B/C
T282	Stoneridge Dr-Jack London Blvd - WB	Foothill Road	Hopyard Rd	Pleasanton	1.52	East	32.1	1	1				3264	27.0	C/D
T283	Telegraph Avenue - NB	51st Street	Broadway	Oakland	2.25	North	28.9	3	3				1019	12.9	D/E
T284	Tennyson Road - WB	Industrial Boulevard	Hesperian Boulevard	Hayward	0.60	Central	28.1	3	3				1346	24.2	B/B
T285	Tesla Road - EB	Livermore Avenue	County Line (EB)	Alameda County	11.93	East	38.4	rural	rural				2623	33.3	B/-
T286	Thornton Avenue - EB	SR-84	I-880	Newark	3.73	South	37.9	3	3				1185	24.0	B/C
T289	Vallecitos Road - NB	SR-84	1st St	Livermore	3.32	East	40.9	2	2				1486	31.8	A/B
T290	Vasco Road - SB	I-580	Tesla Road	Livermore	4.05	East	39.0	2	2				836	32.1	A/B
T291	Village Parkway - NB	Dublin Boulevard	County Line	Dublin	1.50	East	32.5	2	2				214	23.2	C/C
T292	W Las Positas Blvd - EB	Owens Drive	Santa Rita Road	Pleasanton	0.22	East	23.5	2	2				2637	17.3	D/D
T295	Washington Avenue - NB	Juana Avenue	Lewelling Blvd	San Leandro	2.72	Central	27.5	3	3				198	16.6	C/D
T296	Washington Boulevard - WB	Fremont Boulevard	Mission Boulevard	Fremont	2.20	South	36.7	3	3				1571	20.2	B/C
T298	Wicks Blvd-Merced Street - SB	Marina Boulevard	Lewelling Blvd	San Leandro	2.19	Central	38.4	3	3				473	25.9	A/B
T299	Winton Avenue - WB	Clawiter Road	Hesperian Boulevard	Hayward	0.54	Central	29.4	3	3				3547	25.6	A/B
T300	14th Avenue - WB	E 8th Street	Foothill Boulevard	Oakland	0.26	North	17.4	3	3				1272	14.3	C/D
T301	14th Street-Lake Merritt	Bush Street	12th Street	Oakland	1.13	North	17.7	3	3	New			654	11.5	D/E

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
	Blvd - EB									Segment					
T303	23rd Avenue - SB	23rd Ave NB/SB Split	E 11th	Oakland	0.15	North	20.6	3	3				1102	23.3	B/C
T304	23rd Avenue - NB	E 12th St	23rd Ave NB/SB Split	Oakland	0.14	North	23.3	3	3				1905	14.4	C/D
T306	40th Street-Shellmound Avenue - EB	Powell Boulevard	Broadway	Emeryville	1.31	North	23.9	3	3				1020	17.1	C/D
T308	52nd Street - EB	Telegraph Avenue	Shattuck Avenue	Oakland	0.11	North	11.2	3	3				3127	9.7	D/F
T313	7th Street-E 8th Street - EB	I-880	14th Avenue	Oakland	3.43	North	23.6	3	3				84	13.8	C/E
T314	98th Avenue - WB	I-580	Airport Access Road	Oakland	3.25	North	29.0	3	3				333	17.5	C/D
T315	Airport Access Road - SB	Hegenberger Road	Dollittle Drive	Oakland	0.32	North	18.6	3	3				212	14.2	C/D
T316	Altamont Pass Road - WB	Greenville Road	County Line	Alameda County	9.71	East	33.0	3	3				72	39.0	A/A
T319	Alvarado-Niles/Smith/NilesBlvd - WB	Union City Boulevard	Mission Boulevard	Fremont	6.89	South	38.2	3	3				680	23.0	B/C
T320	Auto Mall Parkway - WB	I-880	Cherry Street	Fremont	0.75	South	20.3	3	3				3678	15.7	C/D
T322	Bernal Avenue - WB	I-680	Sunol Blvd/First St	Pleasanton	1.37	East	28.5	1	1				1481	24.1	C/D
T323	Broadway - SB	College Ave	SR24	Oakland	0.94	North	25.9	3	3				1538	20.3	B/C
T325	Buchanan Street-Marin Avenue - WB	I-80	Arlington/Del Norte	Berkeley	2.11	North	22.3	3	3				890	16.1	C/D
T328	Castro Valley Boulevard-Mattox - WB	Mission Boulevard	Crow Canyon Road	Alameda County	2.70	Central	29.5	3	3				565	15.7	C/D
T329	Central Avenue - SB	I-880	Cherry Street	Newark	0.85	South	30.4	3	3				277	23.1	B/C
T332	Clawiter Road - NB	Winton Avenue	SR-92	Hayward	1.75	Central	25.6	3	3				2982	17.7	C/D
T336	Dyer Street - NB	Whipple Road	Alvarado Boulevard	Union City	1.15	South	22.3	3	3				3002	15.0	C/D
T338	E 18th Street - WB	Lakeshore Avenue	Park Boulevard	Oakland	0.22	North	16.1	3	3				243	11.5	D/E
T339	East Avenue - WB	Livermore Avenue	Vasco Road	Livermore	2.53	East	32.5	2	2				1750	26.5	B/C
T340	El Charro Road - SB	I-580	Stoneridge Drive	Pleasanton	0.26	East	27.0	2	2				2423	25.4	B/C
T341	Estudillo Avenue - WB	E 14th St	MacArthur Blvd	San Leandro	0.98	Central	24.3	3	3				1249	20.4	B/C
T344	First Street - WB	Stanley Boulevard	Railroad Avenue	Livermore	0.883	East	24.9	2	2				204	15.1	D/E
T345	Foothill Road - SB	Stoneridge Drive	I-580	Pleasanton	0.74	East	36.0	2	2				3318	22.8	C/C
T347	Fruitvale Avenue - SB	Tilden Way	MacArthur Boulevard	Alameda	2.37	North	23.1	3	3	New			152	11.7	D/E

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T348	Gilman Street - WB	I-80	San Pablo Boulevard	Berkeley	0.63	North	18.6	3	3	Segment			1851	15.0	C/D
T349	Gimmer Boulevard - NB	Paseo Padre Parkway	Mission Boulevard	Fremont	5.08	South	32.9	3	3				364	24.7	B/B
T350	Harrison St-Oakland Ave - SB	MacArthur Blvd	20th Street	Oakland	0.99	North	29.1	3	3				423	16.3	C/D
T351	High Street - WB	I-580	MacArthur Blvd	Oakland	0.05	North	16.6	3	3				1245	12.8	D/E
T352	Industrial Blvd-Pkwy West - WB	Clawiter Road	Mission Boulevard	Hayward	5.16	Central	33.7	3	3				2393	25.4	A/B
T355	Lewelling Boulevard - WB	Hesperian Boulevard	Mission Boulevard	San Leandro	1.42	Central	24.7	3	3				311	17.0	C/D
T356	Lewelling Boulevard - EB	Wicks Boulevard	Hespedian Boulevard	San Leandro	1.53	Central	32.7	3	3				890	19.9	B/C
T357	Livermore Avenue - SB	I-580	Tesla Road	Livermore	3.29	East	38.6	2	2				329	20.4	C/D
T358	MacArthur-SantaClara - EB	San Pablo Avenue	Piedmont Ave	Emeryville	1.56	North	43.2	3	3				1519	11.8	D/E
T359	Main St-Santa Rita Rd - SB	Bernal Avenue	Stoneridge Drive	Pleasanton	3.10	East	35.1	2	2				3151	16.9	D/E
T360	Marina Boulevard - EB	Dollitle Drive	Washington Avenue	San Leandro	1.80	Central	22.9	3	3				1028	16.3	C/D
T361	Market Street - SB	55th Street	Stanford Avenue	Oakland	0.36	North	21.2	3	3				1819	13.9	C/E
T362	Martin Luther King Jr Way - SB	Marin Avenue	Adeline Street	Berkeley	2.67	North	21.9	3	3				1693	16.5	C/D
T363	Martin Luther King Jr Way - SB	San Pablo Avenue	47th Street	Oakland	1.78	North	34.7	3	3				92	18.5	C/C
T364	Mission Boulevard - NB	I-680	I-680	Fremont	3.10	South	29.3	3	3				3656	14.0	C/E
T370	Owens Drive - WB	Willow Road	W Las Positas Blvd	Pleasanton	1.10	East	38.0	2	2				2205	19.7	C/D
T371	Park Boulevard - WB	E 18th Street	SR-13	Piedmont	3.12	North	33.8	3	3				475	22.8	B/C
T372	Park Street - SB	Otis Drive	Encinal Avenue	Alameda	0.42	North	21.0	3	3				2028	14.0	C/E
T373	Paseo Padre Parkway - EB	Peralta Boulevard	Grimmer Boulevard	Fremont	2.30	South	29.8	3	3				2503	23.4	B/C
T374	Paseo Padre Parkway - WB	SR-84	Ardenwood Boulevard	Newark	1.50	South	45.7	3	3				1419	40.2	A/A
T375	Patterson Pass Road - WB	Vasco Road	County Line	Livermore	10.11	East	38.0	rural	rural				170	31.2	B/-
T376	Redwood Road - SB	I-580	Castro Valley Boul	Alameda	0.38	Central	24.2	3	3				1512	14.2	C/D
T377	San Leandro Blvd - NB	E 14th Street	San	San	2.18	Central	34.3	3	3	New			252	20.5	B/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	2016 results			2018 Results		
										Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
			Leandro/Oakland	Leandro						Segment					
T378	San Leandro Street - WB	Fruitvale Avenue	Oakland//SL border	Oakland	4.33	North	34.3	3	3				94	19.4	B/C
T379	San Pablo Avenue - SB	I-580	16th Street	Oakland	1.70	North	22.4	3	3				60	17.0	C/D
T381	Seminary Avenue - WB	MacArthur Boulevard	I-580	Oakland	0.67	North	28.0	3	3				1731	24.5	B/B
T384	Stevenson Boulevard - SB	Cherry Street	Mission Boulevard	Fremont	4.02	South	30.0	3	3				1287	23.7	B/C
T386	Telegraph Avenue - SB	51st Street	Broadway	Oakland	2.25	North	28.8	3	3				216	12.3	D/E
T387	Tennyson Road - EB	Industrial Boulevard	Hesperian Boulevard	Hayward	0.60	Central	22.0	3	3				2146	20.2	B/C
T389	Thornton Avenue - WB	SR-84	I-880	Newark	3.73	South	38.0	3	3				1320	24.8	B/B
T391	UC Blvd-Ardenwood-Newark Blvd - WB	Central Avenue	SR 84	Newark	2.15	South	28.4	3	3				1589	20.5	B/C
T392	Vallecitos Road - SB	SR-84	1st St	Livermore	3.32	East	36.1	2	2				1095	30.2	A/B
T393	Vasco Road - NB	I-580	Tesla Road	Livermore	3.11	East	38.6	2	2				2099	28.8	B/B
T394	Village Parkway - SB	Dublin Boulevard	County Line	Dublin	1.50	East	32.5	2	2				1023	23.3	C/C
T395	W Las Positas Blvd - WB	Owens Drive	Santa Rita Road	Pleasanton	0.21	East	24.8	2	2				1018	19.0	C/D
T398	Washington Avenue - SB	Juana Avenue	Lewelling Blvd	San Leandro	2.72	Central	25.7	3	3				197	17.5	C/D
T399	Washington Boulevard - EB	Fremont Boulevard	Mission Boulevard	Fremont	2.20	South	34.8	3	3				1970	16.2	C/D
T401	Wicks Blvd-Merced Street - NB	Marina Boulevard	Lewelling Blvd	San Leandro	2.19	Central	35.5	3	3				300	24.9	B/B
T402	Winton Avenue - EB	Clawiter Road	Hesperian Boulevard	Hayward	0.54	Central	23.0	3	3				3703	12.8	D/E
T403	Stoneridge Dr-Jack London Blvd - WB	Hopyard Rd	Santa Rita Rd	Pleasanton	1.56	East	33.0	2	2				2498	27.2	B/C
T405	Stoneridge Dr-Jack London Blvd - EB	Santa Rita Rd	Hopyard Rd	Pleasanton	1.56	East	28.8	2	2				3577	27.3	B/C
T406	Stoneridge Dr-Jack London Blvd - EB	Hopyard Rd	Foothill Road	Pleasanton	1.51	East	30.7	1	1				3585	25.2	C/D
T407	UC Blvd-Ardenwood-Newark Blvd - EB	SR 84	Central Ave	Newark	2.15	South	34.0	3	3				1459	21.9	B/C
T409	SantaClara - NB	I-580	Okland Avenue	Oakland	0.82	North	24.5	3	3				515	18.9	C/C
T412	MacArthur-SantaClara - WB	Piedmont Ave	San Pablo Avenue	Emeryville	1.56	North	42.9	3	3				1244	15.9	C/D
T414	MacArthur-SantaClara	Grand Ave	Seminary Ave	Oakland	4.77	North	27.1	3	3				61	15.3	C/D
T415	MacArthur-SantaClara	Seminary Ave	Estudillo Ave	Oak- San	0.32	Norh-	20.5	3	3	New			61	18.5	C/C

Table B-8: 2018 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	2016 results			2018 Results		
										Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
	- SB			Leandro		Central				Segment					
T416	El Charro Road - SB	Stoneridge Drive	eridge Drive to Buach Rd	Pleasanton	0.09	East	24.5	2	2				2514	24.8	B/C
T417	El Charro Road - NB	Stoneridge Drive	eridge Drive to Buach Rd	Pleasanton	0.09	East	21.0	2	2				2987	21.0	C/D

B.9 | Arterials (Tier 2) - AM Peak Period (INRIX data)

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	2016 results			2018 Results		
										Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T1	W.Grand Ave - Grand Ave -EB	I-80/Maritime St	San Pablo Ave	Oak	1.63	North	26.6	2	3	653	20.2	C/C	314	21.4	C/C
T2	W.Grand Ave - Grand Ave -EB	San Pablo Ave	Broadway	Oak	0.4	North	19.9	3	4	1411	12.2	D/D	1741	12.7	D/D
T3	W.Grand Ave - Grand Ave -EB	Broadway	I-580	Oak	1.08	North	21.6	3	4	462	15.4	C/C	471	16.1	C/C
T4	W.Grand Ave - Grand Ave -WB	I-580	Broadway	Oak	1.08	North	21.5	3	4	767	15.6	C/C	1370	14.5	C/C
T5	W.Grand Ave - Grand Ave -WB	Broadway	San Pablo Ave	Oak	0.4	North	20.8	3	4	1158	11.2	D/D	1415	12.6	D/D
T6	W.Grand Ave - Grand Ave -WB	San Pablo Ave	I-80/Maritime St	Oak	1.63	North	28.3	2	3	2161	23.7	C/C	2686	24.8	B/B
T7	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	I-980 ON Ramp/Brush St	Webster	Oak	0.6	North	14.4	3	4	6	17.0	C/C	Commercial Data Not Available		
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	Webster	East side of Lake Merritt Channel	Oak	0.66	North	14.7	3	4	6	14.9	C/C	Commercial Data Not Available		
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	1.15	North	16.7	3	4	6	16.1	C/C	187	16.6	C/C
T10	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	MacArthur Blvd/I-580 ON Ramp	East side of Lake Merritt Channel	Oak	1.15	North	16.8	3	4	6	16.1	C/C	1559	17.5	C/C
T11	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	East side of Lake Merritt Channel	Webster	Oak	0.64	North	15.9	3	4	6	11.9	D/D	Commercial Data Not Available		
T12	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oak	0.6	North	17.4	3	4	6	10.0663	D/D	Commercial Data Not Available		
T13	Telegraph Ave-NB	51st St	Russell St	Oak - Berk	1.41	North	15.0	3	4	6	16.3	C/C	1038	16.1	C/C
T14	Telegraph Ave-NB	Russell St	Bancroft Way	Berk	0.77	North	13.5	3	4	6	22.5	B/B	735	15.5	C/C
T15	Dana-Dwight-Telegraph-SB	Bancroft Way	Russell St	Berk	0.9	North	13.9	3	4	6	13.3	C/C	Commercial Data Not Available		
T16	Telegraph Ave-SB	Russell St	51st St	Oak - Berk	1.41	North	18.5	3	4	6	17.8	C/C	1043	17.9	C/C
T17	Broadway-SB	Broadway/College Ave	Grand Ave	Oak	1.91	North	20.8	2	3	372	15.5	D/D	1523	13.4	E/E

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T18	Broadway-SB	Grand Ave	14th St	Oak	0.55	North	18.2	3	4	1140	14.5	C/C	1292	12.1	D/D
T19	Broadway-SB	14th St	5th St/Broadway	Oak	0.48	North	17.9	3	4	1058	9.1	D/D	1357	9.1	D/D
T20	Broadway (Connection to I-880)-SB	5th St/Broadway	I-880 ON Ramp	Oak	0.21	North	62.9	1	1	6	17.4	D/D	Commercial Data Not Available		
T21	Broadway (Connection to I-880)-NB	I-880 OFF Ramp	5th St/Broadway	Oak	1.26	North	23.0	1	2	6	21.9	D/D	Commercial Data Not Available		
T22	Broadway-NB	5th St/Broadway	14th St	Oak	0.48	North	17.1	3	4	532	10.9	D/D	770	9.4	D/D
T23	Broadway-NB	14th St	Grand Ave	Oak	0.55	North	18.3	3	4	1164	13.2	C/C	1382	11.0	D/D
T24	Broadway-NB	Grand Ave	Broadway/College Ave	Oak	1.91	North	21.9	2	3	234	15.9	D/D	1091	13.8	E/E
T25	Durant-EB	Shattuck	College Ave.	Berk	0.73	North	16.0	3	4	6	15.0	C/C	Commercial Data Not Available		
T26	College Ave-SB	Bancroft Way/College Ave	Ashby Ave	Berk	0.85	North	16.8	3	4	807	14.6	C/C	725	14.9	C/C
T27	College Ave-SB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oak - Berk	0.83	North	19.7	3	4	302	14.6	C/C	838	15.0	C/C
T28	College Ave-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Oak	0.61	North	16.7	3	4	706	13.6	C/C	1558	15.2	C/C
T29	College Ave-NB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Oak	0.61	North	17.0	3	4	1149	15.0	C/C	1930	14.4	C/C
T30	College Ave-NB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oak - Berk	0.83	North	18.3	3	4	747	13.1	C/C	1423	12.8	D/D
T31	College Ave-NB	Ashby Ave	Bancroft Way/College Ave	Berk	0.85	North	16.8	3	4	1079	14.4	C/C	1485	14.4	C/C
T32	Bancroft-WB	College Ave.	Shattuck	Berk	0.73	North	12.5	3	4	6	13.8	C/C	440	13.0	C/D
T33	51st St-EB	SR 24 Off Ramp/52nd St	Broadway	Oak	0.75	North	15.0	3	4	6	16.7	C/C	1973	14.5	C/C
T34	51st St-WB	Broadway	SR 24 Off Ramp/52nd St	Oak	0.75	North	15.7	3	4	6	18.9	C/C	1318	18.5	C/C
T35	Shattuck Ave-NB	51st	Alcatraz Ave.	Oak - Berk	0.81	North	22.8	3	4	6	18.2	C/C	2002	20.3	B/B
T36	Shattuck Ave-NB	Alcatraz Ave.	Adeline St.	Berk	0.7	North	16.7	3	4	6	16.1	C/C	1707	16.3	C/C
T37	Shattuck Ave-SB	Adeline St.	Alcatraz Ave.	Berk	0.7	North	17.1	3	4	6	17.6	C/C	2492	16.9	C/C
T38	Shattuck Ave-SB	Alcatraz Ave.	51st	Oak	0.81	North	17.3	3	4	6	19.9	B/B	2880	19.7	B/B
T39	Powell St-Stanford Ave-EB	NB I-80 OFF Ramp	San Pablo Ave	Emery	0.75	North	15.5	2	3	6	21.7	C/C	Commercial Data Not Available		
T40	Powell St-Stanford Ave-EB	San Pablo Ave	MLK Jr Way	Oak - Berk	0.76	North	17.0	2	3	6	20.3	C/C	Commercial Data		

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
													Not Available		
T41	Powell St-Stanford Ave-WB	MLK Jr Way	San Pablo Ave	Oak - Berk	0.76	North	19.1	2	3	6	24.7	B/B	Commercial Data Not Available		
T42	Powell St-Stanford Ave-WB	San Pablo Ave	NB I-80 OFF Ramp	Emery - Oak	0.75	North	15.3	2	3	6	16.9	D/D	2207	18.7	C/C
T43	40thSt-Shellmound Ave-EB	Shellmound Way (north of Powell St)	40th St	Emery	0.73	North	24.6	2	3	6	29.3	B/B	Commercial Data Not Available		
T44	40thSt-Shellmound Ave-EB	40th St	San Pablo Ave	Emery	0.68	North	16.5	3	4	6	21.9	B/B	333	17.5	C/C
T45	40thSt-Shellmound Ave-WB	San Pablo Ave	40th St	Emery	0.68	North	22.0	3	4	6	29.9	A/A	534	21.1	B/B
T46	40thSt-Shellmound Ave-WB	40th St	Shellmound Way (north of Powell St)	Emery	0.73	North	29.0	2	3	6	24.7	B/B	Commercial Data Not Available		
T47	International Blvd-NB	42nd Ave	Fruitvale Ave	Oak	0.62	North	21.9	3	4	2696	11.8	D/D	2015	10.8	D/D
T48	International Blvd-NB	Fruitvale Ave	14th Ave	Oak	1.38	North	22.9	3	4	2071	19.5	B/B	993	16.9	C/C
T49	International Blvd-NB	14th Ave	Lake Merritt Blvd	Oak	0.88	North	22.5	3	4	1532	17.3	C/C	878	16.7	C/C
T50	International Blvd-SB	Lake Merritt Blvd	14th Ave	Oak	0.88	North	21.5	3	4	295	17.8	C/C	196	19.0	B/C
T51	International Blvd-SB	14th Ave	Fruitvale Ave	Oak	1.38	North	22.9	3	4	643	19.7	B/B	421	17.7	C/C
T52	International Blvd-SB	Fruitvale Ave	42nd Ave	Oak	0.62	North	21.4	3	4	1228	14.7	C/C	747	14.8	C/C
T53	73d Ave-NB	International Blvd/ 73rd Ave	73rd Ave/Foothill Blvd	Oak	1.07	North	28.1	2	3	2144	21.3	C/C	1753	19.7	C/C
T54	Foothill Blvd-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oak	1.02	North	20.3	3	4	151	18.1	C/C	113	16.0	C/C
T55	Foothill Blvd-NB	Seminary Ave	High St	Oak	1.22	North	21.5	3	4	717	18.5	C/C	446	16.9	C/C
T56	Foothill Blvd-NB	High St	Fruitvale Ave	Oak	0.9	North	19.8	3	4	586	10.4	D/D	438	9.5	D/D
T57	Foothill Blvd-NB	Fruitvale Ave	14th Ave	Oak	1.32	North	22.9	2	3	804	18.9	C/C	465	19.0	C/C
T58	Foothill Blvd-NB	14th Ave	1st Ave/Lake Shore Blvd	Oak	0.88	North	20.5	3	4	103	14.2	C/C	117	20.0	B/B
T60	Foothill Blvd-SB	14th Ave	Fruitvale Ave	Oak	1.32	North	21.8	2	3	323	16.9	D/D	62	18.1	C/C
T61	Foothill Blvd-SB	Fruitvale Ave	High St	Oak	0.9	North	20.8	3	4	339	13.8	C/C	307	13.9	C/C
T62	Foothill Blvd-SB	High St	Seminary Ave	Oak	1.22	North	20.2	3	4	413	18.0	C/C	353	18.4	C/C
T63	Foothill Blvd-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	1.02	North	21.2	3	4	315	16.2	C/C	269	15.1	C/C
T64	73d Ave-SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oak	1.07	North	26.9	2	3	1346	21.5	C/C	2006	19.9	C/C
T65	E. 15th St-SB/14th Ave	1st Ave	Foothill Blvd/14th Ave	Oak	0.98	North	14.8	3	4	6	20.0	B/B	Commercial Data Not Available		
T66	High St-EB	Otis Dr	Central Ave	Ala	0.58	North	19.7	3	4	487	17.3	C/C	985	17.4	C/C
T67	High St-EB	Central Ave	Fernside Blvd	Ala	0.48	North	19.3	3	4	1717	17.4	C/C	2521	16.0	C/C

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T68	High St-EB	Fernside Blvd	NB I-880 OFF Ramp	Ala - Oak	0.5	North	14.8	2	3	895	12.2	E/E	1599	11.4	E/E
T69	High St-EB	NB I-880 OFF Ramp	Foothill Blvd	Oak	0.61	North	16.3	3	4	1629	13.0	C/D	1967	13.5	C/C
T70	High St-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oak	1.29	North	20.9	3	4	1196	18.5	C/C	1728	15.7	C/C
T71	High St-WB	MacArthur Blvd/WB I-580 OFF Ramp	Foothill Blvd	Oak	1.29	North	21.2	3	4	514	20.1	B/B	832	19.6	B/B
T72	High St-WB	Foothill Blvd	NB I-880 OFF Ramp	Oak	0.61	North	16.9	3	4	1122	11.6	D/D	1018	11.1	D/D
T73	High St-WB	NB I-880 OFF Ramp	Fernside Blvd	Ala - Oak	0.5	North	21.6	2	3	887	17.7	D/D	1393	17.7	D/D
T74	High St-WB	Fernside Blvd	Central Ave	Ala	0.48	North	16.8	3	4	1504	20.9	B/B	2173	20.7	B/B
T75	High St-WB	Central Ave	Otis Dr	Ala	0.58	North	24.5	3	4	810	16.6	C/C	1160	18.9	C/C
T76	Crow Cyn Rd/Grove Way-NB	A St/Redwood Rd	EB I-580 ON Ramp/ Grove Way	Uninc	0.95	Central	29.0	2	3	678	22.8	C/C	844	21.1	C/C
T77	Crow Cyn Rd/Grove Way-NB	EB I-580 ON Ramp/Grove Way	Cull Cyn	Uninc	0.81	Central	32.1	1	2	2248	18.4	D/D	2635	20.4	D/D
T78	Crow Cyn Rd-NB	Cull Cyn	Cold Water Dr	Uninc	0.88	Central	42.3	1	2	2581	37.8	A/A	2848	38.3	A/A
T79	Crow Cyn Rd-NB	Cold Water Dr	0.43 miles north of Norris Cyn Rd	Uninc	2.41	Central	42.0	Rural	Rural	3342	38.4	A/-	3666	38.4	A/-
T80	Crow Cyn Rd-NB	0.43 miles north of Norris Cyn Rd	County Line	Uninc	2.97	Central	42.0	Rural	Rural	3342	38.4	A/-	3666	38.4	A/-
T81	Crow Cyn Rd-SB	County Line	0.43 miles north of Norris Cyn Rd	Uninc	2.97	Central	41.4	Rural	Rural	3437	40.7	A/-	3692	39.4	A/-
T82	Crow Cyn Rd-SB	0.43 miles north of Norris Cyn Rd	Cold Water Dr	Uninc	2.4	Central	41.4	Rural	Rural	3437	40.7	A/-	3692	39.4	A/-
T83	Crow Cyn Rd-SB	Cold Water Dr	Cull Cyn	Uninc	0.89	Central	41.6	1	2	2636	39.0	A/A	3147	37.7	A/A
T84	Crow Cyn Rd/Grove Way-SB	Cull Cyn	EB I-580 ON Ramp/Grove Way	Uninc	0.82	Central	36.1	1	2	2348	27.5	C/C	2892	26.7	C/C
T85	Crow Cyn Rd/Grove Way-SB	EB I-580 ON Ramp/ Grove Way	A St/Redwood Rd	Uninc	0.94	Central	30.7	2	3	1471	22.4	C/C	1993	24.0	B/C
T86	Winton Ave - D St-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hay	0.39	Central	25.7	2	3	3491	22.4	C/C	3692	22.0	C/C
T87	Winton Ave - D St-EB	SB I-880 ON Ramp	Santa Clara St	Hay	0.35	Central	33.5	2	3	3183	25.2	B/B	2803	23.3	C/C
T88	Winton Ave - D St-EB	Santa Clara St	Soto Rd	Hay	0.55	Central	24.1	2	3	3350	18.9	C/C	3291	17.6	D/D
T89	Winton Ave - D St-EB	Soto Rd	Foothill Blvd/D St	Hay	0.92	Central	24.5	2	3	2203	13.5	E/E	2019	13.8	E/E
T90	Winton Ave - D St-WB	Foothill Blvd/D St	Soto Rd	Hay	0.92	Central	27.2	2	3	2290	16.6	D/D	2099	16.5	D/D
T91	Winton Ave - D St-WB	Soto Rd	Santa Clara St	Hay	0.55	Central	23.0	2	3	3469	17.1	D/D	3350	17.6	D/D
T92	Winton Ave - D St-WB	Santa Clara St	SB I-880 ON Ramp	Hay	0.35	Central	34.7	2	3	3243	26.2	B/B	3374	28.2	B/B

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T93	Winton Ave - D St-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hay	0.39	Central	24.1	2	3	3496	13.5	E/E	3706	14.8	D/D
T94	A St-EB	Foothill Blvd/A St	Redwood Rd/Grove Way	Hay - Uninc	0.8	Central	23.6	2	3	2440	21.8	C/C	3183	20.9	C/C
T95	A St-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Uninc	0.42	Central	18.5	2	3	2038	25.7	B/B	3105	21.9	C/C
T96	A St-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Uninc	0.42	Central	28.8	2	3	3405	21.1	C/C	3622	22.4	C/C
T97	A St-WB	Redwood Rd/Grove Way	Foothill Blvd/A St	Uninc	0.8	Central	15.8	2	3	3448	15.8	D/D	3655	16.9	D/D
T98	Hesperian Blvd-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Uni Cty	0.98	South	26.5	1	2	1693	26.4	C/C	2405	24.6	C/C
T99	Hesperian Blvd-Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	0.3	South	32.9	1	2	3129	28.9	B/B	3545	26.5	C/C
T100	Hesperian Blvd-Union City Blvd-NB	Hesperian/Union City Blvd/overbridge	Industrial Blvd	Hay	0.57	South	26.4	1	2	3021	21.4	D/D	3507	19.1	D/D
T101	Hesperian Blvd-Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Hay	1.05	South	25.2	2	3	3303	25.8	B/B	3323	23.4	C/C
T102	Hesperian Blvd-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Hay	1.05	South	26.8	2	3	3427	19.1	C/C	3555	16.6	D/D
T103	Hesperian Blvd-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Hay	0.57	South	19.3	1	2	1946	25.6	C/C	1718	22.0	C/D
T104	Hesperian Blvd-Union City Blvd-SB	Hesperian/Union City Blvd/overbridge	Whipple Rd	Uni Cty	0.3	South	22.1	1	2	3255	27.2	C/C	3700	25.6	C/C
T105	Hesperian Blvd-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Uni Cty	0.98	South	29.5	1	2	3069	26.5	C/C	3588	25.2	C/C
T106	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Fre	0.22	South	30.6	1	2	1553	28.9	B/B	1915	26.0	C/C
T107	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Uni Cty - Fre	1.42	South	32.4	1	2	192	20.8	D/D	1450	23.4	C/C
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Uni Cty	0.51	South	28.5	1	2	70	15.1	E/E	1627	18.9	D/D
T109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Uni Cty	0.51	South	28.1	1	2	1918	18.2	D/D	2410	17.5	D/D
T110	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Uni Cty - Fre	1.42	South	31.2	1	2	1836	24.2	C/C	2405	23.0	C/C
T111	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Fre	0.22	South	31.6	1	2	2758	26.9	C/C	3166	27.7	C/C
T112	Fremont Blvd-NB	NB I-880 OFF Ramp	Automall Parkway	Fre	1.28	South	34.7	1	2	882	27.1	C/C	1147	24.5	C/C
T113	Fremont Blvd-NB	Automall Parkway	Blacow Rd	Fre	0.91	South	34.2	1	2	2640	28.4	B/B	2171	28.8	B/B

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T114	Fremont Blvd-NB	Blacow Rd	Adams Ave	Fre	0.38	South	28.0	1	2	3300	22.7	C/C	3414	23.5	C/C
T115	Fremont Blvd-NB	Adams Ave	Stevenson Rd	Fre	1.17	South	27.9	2	3	2350	22.3	C/C	2853	23.2	C/C
T116	Fremont Blvd-NB	Stevenson Rd	Mowry Ave	Fre	1	South	30.2	2	3	1316	24.0	B/C	1399	26.2	B/B
T117	Fremont Blvd-NB	Mowry Ave	Peralta Blvd	Fre	1.21	South	30.0	2	3	1359	21.4	C/C	1493	20.9	C/C
T118	Fremont Blvd-NB	Peralta Blvd	Thornton Ave	Fre	0.33	South	30.9	2	3	1115	16.2	D/D	1433	16.1	D/D
T119	Fremont Blvd-NB	Thornton Ave	Decoto Rd	Fre	1.33	South	32.0	1	2	1422	24.4	C/C	2075	23.5	C/C
T120	Fremont Blvd-NB	Decoto Rd	Paseo Padre Pkwy	Fre	0.56	South	31.0	1	2	1413	26.7	C/C	1840	25.6	C/C
T121	Fremont Blvd-NB	Paseo Padre Pkwy	NB I-880 OFF Ramp	Fre	0.39	South	31.0	1	2	1102	26.2	C/C	1528	25.7	C/C
T122	Fremont Blvd-SB	NB I-880 OFF Ramp	Paseo Padre Pkwy	Fre	0.39	South	32.0	1	2	2245	26.5	C/C	2785	26.3	C/C
T123	Fremont Blvd-SB	Paseo Padre Pkwy	Decoto Rd	Fre	0.56	South	29.7	1	2	1899	19.7	D/D	2684	17.9	D/D
T124	Fremont Blvd-SB	Decoto Rd	Thornton Ave	Fre	1.33	South	30.2	1	2	2119	21.4	D/D	2649	21.7	D/D
T125	Fremont Blvd-SB	Thornton Ave	Peralta Blvd	Fre	0.32	South	29.3	2	3	2610	15.4	D/D	2908	17.7	D/D
T126	Fremont Blvd-SB	Peralta Blvd	Mowry Ave	Fre	1.21	South	29.4	2	3	1765	21.8	C/C	2572	21.7	C/C
T127	Fremont Blvd-SB	Mowry Ave	Stevenson Rd	Fre	1	South	32.3	2	3	1516	26.2	B/B	2495	26.2	B/B
T128	Fremont Blvd-SB	Stevenson Rd	Adams Ave	Fre	1.17	South	27.8	2	3	2120	22.9	C/C	2404	25.9	B/B
T129	Fremont Blvd-SB	Adams Ave	Blacow Rd	Fre	0.38	South	27.9	1	2	3158	23.0	C/C	2789	26.2	C/C
T130	Fremont Blvd-SB	Blacow Rd	Automall Parkway	Fre	0.91	South	33.1	1	2	2445	23.1	C/C	2780	27.6	C/C
T131	Fremont Blvd-SB	Automall Parkway	NB I-880 OFF Ramp	Fre	1.28	South	34.9	1	2	2281	29.3	B/B	2791	30.4	B/B
T132	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fre	0.85	South	23.1	1	2	6	31.9	B/B	3371	26.6	C/C
T133	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fre	0.74	South	29.5	1	2	6	17.9	D/D	3357	21.1	D/D
T134	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fre	0.75	South	21.1	1	2	6	14.0	E/E	3339	21.4	D/D
T135	Automall Parkway-WB	Fremont Blvd	NB I-880 OFF Ramp	Fre	0.85	South	27.1	1	2	6	28.5	B/B	3678	31.2	B/B
T136	Vasco Rd-NB	WB I-580 OFF Ramp	Scenic Ave	Liv	0.44	East	36.3	1	2	2755	28.3	B/B	3253	28.1	B/B
T137	Vasco Rd-NB	Scenic Ave	Dalton Ave/City-County Line	Liv	0.68	East	37.4	1	2	3022	32.2	B/B	3441	30.3	B/B
T138	Vasco Rd-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Liv	3.11	East	53.0	Rural	Rural	3136	55.8	A/-	3602	55.0	A/-
T139	Vasco Rd-NB	N. Vasco Rd/Vasco Rd	Local Rd underpass /County Line	Liv	2.25	East	53.0	Rural	Rural	3136	55.8	A/-	3602	55.0	A/-
T140	Vasco Rd-SB	Local Rd underpass/County Line	N. Vasco Rd/Vasco Rd	Liv	2.25	East	46.8	Rural	Rural	3259	35.3	C/-	3706	28.6	D/-
T141	Vasco Rd-SB	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Liv	3.11	East	46.8	Rural	Rural	3259	35.3	C/-	3706	28.6	D/-

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T142	Vasco Rd-SB	Dalton Ave/City-County Line	Scenic Ave	Liv	0.68	East	34.3	1	2	3254	33.0	B/B	3703	28.7	B/B
T143	Vasco Rd-SB	Scenic Ave	WB I-580 OFF Ramp	Liv	0.44	East	32.0	1	2	2960	32.9	B/B	3520	28.9	B/B
T144	Dublin Blvd.-EB	San Ramon Rd	Village Parkway	Dub	0.73	East	26.5	2	3	1476	19.3	C/C	1847	20.6	C/C
T145	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dub	0.81	East	29.5	2	3	1736	24.0	B/C	2073	22.6	C/C
T146	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dub	1.21	East	34.1	1	2	983	25.0	C/C	3507	25.6	C/C
T147	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dub	0.89	East	30.2	1	2	694	22.4	C/C	1266	23.5	C/C
T148	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dub	0.89	East	29.1	1	2	841	24.7	C/C	3265	26.4	C/C
T149	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dub	1.21	East	32.8	1	2	1035	21.1	D/D	3561	25.4	C/C
T150	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dub	0.81	East	29.5	2	3	2927	23.5	C/C	3424	24.6	B/B
T151	Dublin Blvd.-WB	Village Parkway	San Ramon Rd	Dub	0.73	East	24.5	2	3	1650	19.4	C/C	2225	18.3	C/C
T152	San Ramon Rd-NB	WB I-580 OFF ramp	Silvergate Dr	Dub	0.64	East	30.8	1	2	1678	22.1	C/C	1300	22.9	C/C
T153	San Ramon Rd-NB	Silvergate Dr	Alcosta Blvd/ Westside Dr/County Line	Dub	0.99	East	35.1	1	2	2284	31.9	B/B	2703	29.4	B/B
T154	San Ramon Rd-SB	Alcosta Blvd/Westside Dr/County Line	Silvergate Dr	Dub	0.99	East	35.8	1	2	2238	33.0	B/B	3093	32.0	B/B
T155	San Ramon Rd-SB	Silvergate Dr	WB I-580 OFF ramp	Dub	0.64	East	32.7	1	2	1270	23.3	C/C	2318	24.7	C/C
T156	Dougherty Rd-NB	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dub	1.12	East	35.4	1	2	2751	24.4	C/C	3456	18.8	D/D
T157	Dougherty Rd-NB	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dub	0.8	East	44.1	1	2	2653	42.4	A/A	3361	37.1	A/A
T158	Dougherty Rd-SB	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dub	0.8	East	43.1	1	2	3041	33.2	B/B	3692	33.8	B/B
T159	Dougherty Rd-SB	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dub	1.12	East	33.1	1	2	2998	21.0	D/D	3619	20.5	D/D
T160	Tassajara Rd-NB	WB I-580 OFF ramp	Central Parkway	Dub	0.49	East	24.7	1	2	6	16.6	E/E	Commercial Data Not Available		
T161	Tassajara Rd-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dub	0.68	East	34.3	1	2	6	25.2	C/C			
T162	Tassajara Rd-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dub	1.04	East	38.4	1	2	6	37.8	A/A			
T163	Tassajara Rd-NB	Fallon Rd	County Line	Uninc	0.51	East	35.2	1	1	6	29.6	B/C			
T164	Tassajara Rd-SB	County Line	Fallon Rd	Uninc	0.51	East	45.2	1	1	6	42.4	A/A			
T165	Tassajara Rd-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dub	1.04	East	38.7	1	2	6	39.8	A/A			
T166	Tassajara Rd-SB	Somerset Ln/N Dublin	Central Parkway	Dub	0.68	East	33.8	1	2	6	21.9	D/D			

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
		Ranch Dr													
T167	Tassajara Rd-SB	Central Parkway	WB I-580 OFF ramp	Dub	0.49	East	25.7	1	2	6	15.9	E/E			
T168	E. Stanley Blvd - Railroad Ave - 1st St-NB	SR 84/Isabel Ave	Murrita Blvd	Liv	0.91	East	31.5	1	2	2045	25.9	C/C	2082	25.1	C/C
T169	E. Stanley Blvd-Railroad Ave-1st St-NB	Murrita Blvd	S Livermore Ave	Liv	1.07	East	23.4	2	3	910	21.7	C/C	699	22.1	C/C
T170	E. Stanley Blvd - Railroad Ave - 1st St-NB	S Livermore Ave	Inman St	Liv	0.46	East	21.7	2	3	865	19.4	C/C	93	18.8	C/C
T171	E. Stanley Blvd - Railroad Ave - 1st St-SB	Inman St	S Livermore Ave	Liv	0.46	East	20.1	2	3	495	18.7	C/C	325	22.1	C/C
T172	E. Stanley Blvd - Railroad Ave - 1st St-SB	S Livermore Ave	Murrita Blvd	Liv	1.07	East	26.6	2	3	2416	23.1	C/C	2809	22.8	C/C
T173	E. Stanley Blvd - Railroad Ave - 1st St-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	0.91	East	21.9	1	2	3168	35.2	A/A	3649	35.1	A/A
T174	Stoneridge Dr-EB	SB I-680 OFF Ramp	Hopyard Rd	Plea	0.93	East	33.2	1	2	2023	28.1	B/B	3233	28.0	B/C
T175	Stoneridge Dr-EB	Hopyard Rd	Hacienda Dr	Plea	0.49	East	29.8	1	2	1397	21.3	D/D	1474	24.7	C/C
T176	Stoneridge Dr-EB	Hacienda Dr	W. Las Positas Blvd	Plea	0.63	East	31.1	1	2	2134	25.5	C/C	2116	29.2	B/B
T177	Stoneridge Dr-EB	W. Las Positas Blvd	Santa Rita Rd	Plea	0.44	East	30.0	1	2	479	21.6	D/D	531	21.4	D/D
T178	Santa Rita Rd-EB	Stoneridge Dr/Santa Rita Rd	W. Los Positas Blvd	Plea	0.29	East	31.1	1	2	2682	30.2	B/B	3170	28.6	B/B
T179	Santa Rita Rd-EB	W. Los Positas Blvd	WB I-580 OFF Ramp	Plea	0.88	East	30.3	1	2	2653	29.8	B/B	3304	31.4	B/B
T180	Santa Rita Rd-WB	WB I-580 OFF Ramp	W. Los Positas Blvd	Plea	0.88	East	31.3	1	2	2636	29.4	B/B	3414	28.7	B/B
T181	Santa Rita Rd-WB	W. Los Positas Blvd	Santa Rita Rd	Plea	0.29	East	31.5	1	2	2856	25.8	C/C	3529	25.1	C/C
T182	Stoneridge Dr-WB	Santa Rita Rd	W. Las Positas Blvd	Plea	0.44	East	31.8	1	2	1401	23.7	C/C	2092	28.1	B/B
T183	Stoneridge Dr-WB	W. Las Positas Blvd	Hacienda Dr	Plea	0.63	East	33.8	1	2	2896	29.2	B/B	3380	34.4	B/B
T184	Stoneridge Dr-WB	Hacienda Dr	Hopyard Rd	Plea	0.49	East	28.8	1	2	2361	18.1	D/D	3015	24.6	C/C
T185	Stoneridge Dr-WB	Hopyard Rd	SB I-680 OFF Ramp	Plea	0.93	East	32.9	1	2	2603	27.9	C/C	3110	29.6	B/B
T186	Sunol Blvd.-1st St-Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Plea	1.23	East	31.2	1	2	607	28.1	B/B	1237	28.7	B/B
T187	Sunol Blvd.-1st St-Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	0.63	East	26.1	3	4	2035	23.7	B/B	3002	22.8	B/B
T188	Sunol Blvd.-1st St-Stanley Blvd.-NB	Ray/Vineyard	Bernal/Valley Ave	Plea	0.86	East	32.1	2	3	618	28.3	B/B	1313	27.3	B/B
T189	Sunol Blvd.-1st St-Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Plea - Uninc	2.98	East	44.9	1	1	2442	47.4	A/A	2895	47.4	A/A
T190	Sunol Blvd.-1st St-Stanley Blvd.-NB	SR 84/Isabel Ave	Bernal /Valley Ave	Plea - Uninc	2.98	East	51.0	1	1	3246	47.4	A/A	3695	50.4	A/A
T191	Sunol Blvd.-1st St-Stanley Blvd.-NB	Bernal Ave/Valley Ave	Ray/Vineyard	Plea	0.86	East	34.6	2	3	2762	27.3	B/B	3245	26.4	B/B
T192	Sunol Blvd.-1st St-Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave	Plea	0.63	East	25.4	3	4	3080	16.3	C/C	3538	16.0	C/C

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T193	Sunol Blvd.-1st St-Stanley Blvd.-NB	Bernal Ave	NB I-680 OFF	Plea	1.23	East	35.6	1	2	3185	25.6	C/C	3660	23.9	C/C
T194	14th Ave - EB	E 8th St	Foothill Blvd	Oak	0.26	North	20.6	3	3	New Segment			684	11.3	D/E
T195	14th St-Lake Merritt Blvd - WB	12th St	Bush St	Oak	1.13	North	16.0	3	3				171	12.1	D/E
T197	23rd Ave - NB	23rd Ave NB/SB Split	E 11th	Oak	0.15	North	23.3	3	3				3028	22.0	B/C
T198	23rd Ave - SB	E 12th St	23rd Ave NB/SB Split	Oak	0.14	North	20.6	3	3				803	15.0	C/D
T200	40th St-Shellmound Ave - WB	Broadway	Powell Blvd	Emery - Oak	1.31	North	25.4	3	3				568	17.6	C/D
T202	52nd St - WB	Telegraph Ave	Shattuck	Oak	0.11	North	57.5	3	3				1691	13.1	C/E
T208	8th St - WB	Harrison	Broadway	Oak	0.22	North	10.0	3	3				1438	9.7	D/F
T209	98th Ave - EB	Airport Access Rd	I-580	Oak	3.25	North	27.8	3	3				968	16.0	C/D
T210	Airport Access Rd - NB	Dollittle Dr	Hegenberger Rd	Oak	0.32	North	25.4	3	3				911	13.9	C/E
T211	Altamont Pass Rd-Grant Line - EB	Greenville Rd	County Line (EB)	Alameda County	9.71	East	39.0	Rural	Rural				189	38.4	A/-
T214	Alvarado-Niles/Smith/Niles Blvd - EB	Union City Blvd	Mission Blvd	Fre - Uni Cty	6.9	South	34.7	3	3				1148	21.0	B/C
T215	Auto Mall Parkway - EB	Cherry St	I-880	Fre	0.75	South	22.9	3	3				3478	20.7	B/C
T217	Bernal Ave - EB	Bernal Ave	Sunol Blvd/First St	Plea	1.37	East	33.6	1	1				2459	27.6	C/C
T218	Broadway - NB	College Ave	SR24	Oak	0.94	North	27.1	3	3				1737	22.2	B/C
T220	Buchanan St-Marin Ave - EB	I-80	Arlington/Del Norte	Berk - Albany	2.12	North	19.0	3	3				1200	15.6	C/D
T224	Casto St - NB	7th St	San Pablo Ave	Oak	0.77	North	22.1	3	3				162	16.3	C/D
T225	Castro Valley Blvd-Mattox - EB	Mission Blvd	Crow Cyn Rd	Alameda County	2.7	Central	27.1	3	3				652	17.6	C/D
T226	Central Ave - NB	Cherry St	I-880	Newark - Fre	0.85	South	33.5	3	3				659	22.1	B/C
T229	Clawiter Rd - SB	Winton Ave	SR-92	Hay	1.75	Central	30.5	3	3				3244	19.0	B/C
T233	Dyer St - SB	Whipple Rd	Alvarado Blvd	Uni Cty	1.15	South	24.8	3	3				2169	22.8	B/C
T235	E 18th St - EB	Lakeshore Ave	Park Blvd	Oak	0.22	North	20.0	3	3				304	16.0	C/D
T236	East Ave - EB	Livermore Ave	Vasco Rd	Liv	2.53	East	35.0	2	2				1698	28.9	B/B
T237	El Charro Rd - NB	Stoneridge Dr	I-580	Plea	0.26	East	22.7	2	2				2030	22.5	C/C
T238	Estudillo Ave - EB	E 14th St	MacArthur Blvd	San Leandro	0.98	Central	23.5	3	3				1064	21.7	B/C
T241	First St - EB	Stanley Blvd	Railroad Ave	Liv	10.11	East	23.4	2	2				109	15.7	D/E
T242	Foothill Rd - NB	Stoneridge Dr	I-580	Plea	0.38	East	23.9	2	2				2195	21.3	C/D
T244	Fruitvale Ave - NB	Tilden Way	MacArthur Blvd	Alameda-Oak	2.18	North	18.2	3	3				317	13.1	C/E
T245	Gilman St - EB	I-80	San Pablo Blvd	Berk	4.33	North	18.0	3	3				1825	16.3	C/D
T246	Gimmer Blvd - SB	Paseo Padre Parkway	Mission Blvd	Fre	0.67	South	33.5	3	3				241	22.1	B/C

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T247	Harrison St-Oakland Ave - EB	20th St	MacArthur Blvd	Oak	4.02	North	30.7	3	3	New Segment			579	19.2	B/C
T248	High St - NB	I-580	MacArthur Blvd	Oak	1.52	North	14.2	3	3				1779	8.9	E/F
T249	Industrial Blvd-Pkwy West - EB	Clawiter Rd	Mission Blvd	Hay	2.25	Central	33.1	3	3				2449	23.0	B/C
T252	Lewelling Blvd - EB	Hesperian Blvd	Hespedian Blvd	San Leandro - Alameda County	0.60	Central	25.4	3	3				434	19.1	B/C
T253	Lewelling Blvd - WB	Hesperian Blvd	Wicks Blvd	San Leandro	11.93	Central	33.7	3	3				1337	23.5	B/C
T254	Livermore Ave - NB	Tesla Rd	I-580	Liv - Alameda County	3.73	East	39.6	2	2				612	24.4	B/C
T255	MacArthur-SantaClara - WB	Estudillo Ave	Seminary Ave	San Leandro - Oak	3.32	Central - North	27.7	3	3				146	17.3	C/D
T257	Marina Blvd - WB	Washington Ave	Dollitle Dr	San Leandro	4.05	Central	23.5	3	3				1306	17.5	C/D
T258	Market St - NB	55th St	Stanford Ave	Oak	1.50	North	25.0	3	3				909	17.6	C/D
T259	Martin Luther King Jr Way - NB	Adeline St	Marin Ave	Berk	0.22	North	22.1	3	3				921	15.9	C/D
T260	Martin Luther King Jr Way - NB	San Pablo Ave	47th St	Oak	2.72	North	27.0	3	3				54	18.2	C/C
T261	Mission Blvd - SB	I-680	I-680	Fre	2.20	South	32.2	3	3				2250	28.1	A/B
T267	Owens Dr - EB	Willow Rd	W Las Positas Blvd	Plea	2.19	East	26.5	2	2				967	21.5	C/D
T268	Park Blvd - EB	E. 18th St	SR-13	Piedmont-Oak	0.54	North	32.0	3	3				370	20.9	B/C
T269	Park St - NB	Otis Dr	Encinal Ave	Alameda	0.26	North	16.0	3	3				1405	16.0	C/D
T270	Paseo Padre Parkway - WB	Grimmer Blvd	Peralta Blvd	Fre	1.13	South	26.8	3	3				1437	25.8	A/B
T271	Paseo Padre Parkway - EB	Sr-84	Ardenwood Blvd	Newark - Fre	0.15	South	45.6	3	3				835	36.8	A/A
T272	Patterson Pass Rd - EB	Vasco	County Line	Liv - Alameda County	0.14	East	38.0	Rural	Rural				349	30.3	C/-
T273	Redwood Rd - NB	I-580	Catro Valley Boul	Alameda County	1.31	Central	25.2	3	3				1707	14.2	C/D
T274	San Leandro Blvd - EB	San Leandro/Oakland	E 14th St	San Leandro - Oak	0.11	Central - North	30.7	3	3				507	20.9	B/C
T275	San Leandro St - EB	Fruitvale Ave	Oakland//SL border	Oak	3.43	North	31.9	3	3				167	21.2	B/C
T278	Seminary Ave - EB	MacArthur Blvd	I-580	Oak	3.25	North	24.8	3	3				1665	21.1	B/C
T281	Stevenson Blvd - NB	Cherry St	Mission Blvd	Fre	0.32	South	27.2	3	3				1815	23.2	B/C
T282	Stoneridge Dr-Jack London Blvd - WB	Hopyard Rd	Foothill Rd	Plesanton	9.71	East	32.1	1	1				3250	27.6	C/C
T283	Telegraph Ave - NB	Broadway	51st St	Oak	6.89	North	28.9	3	3				303	14.8	C/D

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T284	Tennyson Rd - WB	Hesperian Blvd	Industrial Blvd	Hay	0.75	Central	28.1	3	3	New Segment			2255	25.3	A/B
T285	Tesla Rd - WB	Livermore Ave	County Line (EB)	Alameda County	1.37	East	38.4	Rural	rural				67	36.5	A/-
T286	Thornton Ave - EB	SR-84	I-880	Newark - Fre	0.94	South	37.9	3	3				2013	25.1	A/B
T289	Vallecitos Rd - NB	Sr-84	1st St	Liv - Alameda County	2.12	East	40.9	2	2				1201	32.4	A/B
T290	Vasco Rd - SB	I-580	Tesla Rd	Liv - Alameda County	2.70	East	39.0	2	2				1843	32.3	A/B
T291	Village Parkway - NB	Dublin Blvd	County Line	Dublin	0.85	East	32.5	2	2				110	19.1	C/D
T292	W Las Positas Blvd - EB	Owens Dr	Santa Rita Rd	Plesanton	1.75	East	23.5	2	2				887	15.6	D/E
T295	Washington Ave - NB	Lewelling Blvd	Juana Ave	San Leandro	1.15	Central	27.5	3	3				395	17.7	C/D
T296	Washington Blvd - WB	Mission Blvd	Fremont Blvd	Fre	0.22	South	36.7	3	3				1735	26.1	A/B
T298	Wicks Blvd-Merced St - SB	Marina Blvd	Lewelling Blvd	San Leandro	2.53	Central	38.4	3	3				213	27.0	A/B
T299	Winton Ave - WB	Hesperian Blvd	Clawiter Rd	Hay	0.26	Central	29.4	3	3				3667	24.9	B/B
T300	14th Ave - WB	Foothill Blvd	E 8th St	Oak	0.98	North	17.4	3	3				987	13.8	C/E
T301	14th St-Lake Merritt Blvd - EB	Brush St	12th St	Oak	0.88	North	17.7	3	3				228	11.8	D/E
T303	23rd Ave - SB	E 11th	23rd Ave NB/SB Split	Oak	0.74	North	20.6	3	3				1011	15.4	C/D
T304	23rd Ave - NB	23rd Ave NB/SB Split	E 12 St	Oak	2.37	North	23.3	3	3				1849	16.6	C/D
T306	40th St-Shellmound Ave - EB	Powell Blvd	Broadway	Emery	0.63	North	23.9	3	3				108	16.2	C/D
T308	52nd St - EB	Shattuck Ave	Telegraph Ave	Oak	5.08	North	11.2	3	3				2489	10.3	D/E
T313	7th St-E 8th St - EB	I-880	14th Ave	Oak	0.99	North	23.6	3	3				91	16.4	C/D
T314	98th Ave - WB	I-580	Airport Access Rd	Oak	0.05	North	29.0	3	3				517	15.2	C/D
T315	Airport Access Rd - SB	Hegenberger Rd	Dollittle Dr	Oak	5.16	North	18.6	3	3				56	11.0	D/E
T316	Altamont Pass Rd-Grant Line - WB	County Line (WB)	Greenville Rd	Alameda County	1.42	East	33.0	Rural	Rural				2790	32.8	A/-
T319	Alvarado-Niles/Smith/NilesBlvd - WB	Mission Blvd	Union City Blvd	Fre - Uni Cty	1.53	South	38.2	3	3				1190	23.3	B/C
T320	Auto Mall Parkway - WB	I-880	Cherry St	Fre	3.29	South	20.3	3	3				3626	19.2	B/C
T322	Bernal Ave - WB	Sunol Blvd/First St	I-680	Plea	1.56	East	28.5	1	1				2246	23.9	C/D
T323	Broadway - SB	SR-24	College Ave	Oak	3.10	North	25.9	3	3				2299	22.5	B/C
T325	Buchanan St-Marin Ave - WB	Arlington/Del Nort	I-80	Berk - Albany	1.80	North	22.3	3	3				834	18.6	C/C
T328	Castro Valley Blvd-Mattox - WB	Crow Cyn Rd	Mission Blvd	Alameda County	0.36	Central	29.5	3	3				887	18.9	C/C

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T329	Central Ave - SB	I-880	Cherry St	Newark - Fre	2.67	South	30.4	3	3	New Segment			945	20.5	B/C
T332	Clawiter Rd - NB	Winton Ave	SR-92	Hay	1.78	Central	25.6	3	3				1767	19.3	B/C
T336	Dyer St - NB	Alvarado Blvd	Whipple Rd	Uni Cty	3.01	South	22.3	3	3				1433	20.3	B/C
T338	E 18th St - WB	Park Blvd	Lakeshore Ave	Oak	1.10	North	16.1	3	3				723	13.1	C/E
T339	East Ave - WB	Vasco Rd	Livermore Ave	Liv	3.12	East	32.5	2	2				1926	25.6	B/C
T340	El Charro Rd - SB	I-580	Stoneridge Dr	Plea	0.42	East	27.0	2	2				2339	26.9	B/C
T341	Estudillo Ave - WB	MacArthur Blvd	E 14th St	San Leandro	2.30	Central	24.3	3	3				1969	19.1	B/C
T344	First St - WB	Stoneridge Dr	I-580	Liv	1.50	East	24.9	2	2				282	16.6	D/E
T345	Foothill Rd - SB	I-580	Stoneridge Dr	Plea	10.11	East	36.0	2	2				3359	27.0	B/C
T347	Fruitvale Ave - SB	MacArthur Blvd	Tilden Way	Alameda-Oak	0.38	North	23.1	3	3				259	13.3	C/E
T348	Gilman St - WB	San Pablo Blvd	I-80	Berk	2.18	North	18.6	3	3				1516	19.3	B/C
T349	Gimmer Blvd - NB	Mission Blvd	Paseo Padre Parkway	Fre	4.33	South	32.9	3	3				151	23.3	B/C
T350	Harrison St-Oakland Ave - SB	MacArthur Blvd	20th St	Oak	1.70	North	29.1	3	3				1646	14.5	C/D
T351	High St - WB	MacArthur Blvd	I-580	Oak	0.67	North	16.6	3	3				1718	14.0	C/E
T352	Industrial Blvd-Pkwy West - WB	Mission Blvd	Clawiter Rd	Hay	4.02	Central	33.7	3	3				2942	25.5	A/B
T355	Lewelling Blvd - WB	Mission Blvd	Hespedian Blvd	San Leandro - Alameda County	2.25	Central	24.7	3	3				636	18.4	C/C
T356	Lewelling Blvd - EB	Wicks Blvd	Hespedian Blvd	San Leandro	0.60	Central	32.7	3	3				591	18.6	C/C
T357	Livermore Ave - SB	I-580	Tesla Rd	Liv - Alameda County	11.93	East	38.6	2	2				253	22.7	C/C
T358	MacArthur-SantaClara - EB	San Pablo Ave	Piedmont Ave	Emery	3.73	North	43.2	3	3				217	15.2	C/D
T359	Main St-Santa Rita Rd - SB	Stoneridge Dr	Bernal Ave	Plea	2.15	East	35.1	2	2				3312	17.5	D/D
T360	Marina Blvd - EB	Dollittle Dr	Washington Ave	San Leandro	3.32	Central	22.9	3	3				417	17.5	C/D
T361	Market St - SB	Stanford Ave	55th St	Oak	3.11	North	21.2	3	3				1725	17.9	C/D
T362	Martin Luther King Jr Way - SB	Marin Ave	Adeline St	Berk	1.50	North	21.9	3	3				1775	17.2	C/D
T363	Martin Luther King Jr Way - SB	47th St	San Pablo Ave	Oak	0.22	North	34.7	3	3				80	21.7	B/C
T364	Mission Blvd - NB	I-680	I-680	Fre	2.72	South	29.3	3	3				1410	26.7	A/B
T370	Owens Dr - WB	W Las Positas Blvd	Willow Rd	Plea	2.20	East	38.0	2	2				1570	23.1	C/C
T371	Park Blvd - WB	SR-13	E 18th St	Piedmont	2.19	North	33.8	3	3				674	19.9	B/C
T372	Park St - SB	Encinal Ave	Otis Dr	Alameda	0.54	North	21.0	3	3				1291	16.4	C/D

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

										2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T373	Paseo Padre Parkway - EB	Peralta Blvd	Grimmer Blvd	Fre	1.56	South	29.8	3	3	New Segment			2334	24.1	B/B
T374	Paseo Padre Parkway - WB	SR-84	Ardenwood Blvd	Newark - Fre	1.56	South	45.7	3	3				3335	40.5	A/A
T375	Patterson Pass Rd - WB	County Line	Vasco Rd	Liv - Alameda County	1.52	East	38.0	Rural	Rural				2435	34.2	B/-
T376	Redwood Rd - SB	Castro Valley Boul	I-580	Alameda County	2.15	Central	24.2	3	3				2139	15.1	C/D
T377	San Leandro Blvd - NB	E 14th St	San Leandro/ Oakland	San Leandro - Oak	0.82	Central - North	34.3	3	3				477	19.1	B/C
T378	San Leandro St - WB	Oakland//SL border	Fruitvale Ave	Oak	4.79	North	34.3	3	3				1090	16.5	C/D
T379	San Pablo Ave - SB	I-580	16th St	Oak	1.56	North	22.4	3	3				305	20.9	B/C
T381	Seminary Ave - WB	I-580	MacArthur Blvd	Oak	4.77	North	28.0	3	3				1772	25.6	A/B
T384	Stevenson Blvd - SB	Mission Blvd	Cherry St	Fre	0.32	South	30.0	3	3				2303	22.8	B/C
T386	Telegraph Ave - SB	51st St	Broadway	Oak	0.09	North	28.8	3	3				252	14.0	C/E
T387	Tennyson Rd - EB	Industrial Blvd	Hespedian Blvd	Hay	0.09	Central	22.0	3	3				1479	19.6	B/C
T388	Tesla Rd - WB	County Line	Livermore Ave	Alameda County	10.11	East	43.0	Rural	Rural				2226	37.1	B/-
T389	Thornton Ave - WB	I-880	SR-84	Newark - Fre	0.38	South	38.0	3	3				2258	26.3	A/B
T391	UC Blvd-Ardenwood-Newark Blvd - WB	Central Ave	SR 84	Newark	2.18	South	28.4	3	3				1013	23.3	B/C
T392	Vallecitos Rd - SB	1st St	SR-84	Liv - Alameda County	4.33	East	36.1	2	2				1793	17.4	D/D
T393	Vasco Rd - NB	Tesla Rd	I-580	Liv - Alameda County	0.67	East	38.6	2	2				1903	30.2	A/B
T394	Village Parkway - SB	County Line	Dublin Blvd	Dublin	4.02	East	32.5	2	2				820	23.3	C/C
T395	W Las Positas Blvd - WB	Santa Rita Rd	Owens Dr	Plea	1.52	East	24.8	2	2				1074	19.5	C/D
T398	Washington Ave - SB	Juana Ave	Lewelling Blvd	San Leandro	2.25	Central	25.7	3	3				319	19.5	B/C
T399	Washington Blvd - EB	Fremont Blvd	Mission Blvd	Fre	0.60	South	34.8	3	3				885	23.6	B/C
T401	Wicks Blvd-Merced St - NB	Lewelling Blvd	Marina Blvd	San Leandro	11.93	Central	35.5	3	3				109	22.5	B/C
T402	Winton Ave - EB	Clawiter Rd	Hespedian Blvd	Hay	3.73	Central	23.0	3	3				3706	22.6	B/C
T403	Stoneridge Dr-Jack London Blvd - WB	Santa Rita Rd	Hopyard Rd	Plea	3.32	East	33.0	2	2				2891	29.4	B/B
T405	Stoneridge Dr-Jack London Blvd - EB	Hopyard Rd	Santa Rita Rd	Plea	4.05	East	28.8	2	2				1414	25.5	B/C

Table B-9: 2018 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX data)

CMP ID	CMP Route	From	To	Jurisdiction	Length (mi)	Plan Area	FFS	Class (1985)	Class (2000)	2016 results			2018 Results		
										Sample	Speed	LOS (85/00)	Sample	Speed	LOS (85/00)
T406	Stoneridge Dr-Jack London Blvd - EB	Foothill Blvd	Hopyard Rd	Plea	1.50	East	30.7	1	1	New Segment			1970	27.4	C/C
T407	UC Blvd-Ardenwood-Newark Blvd - EB	SR 84	Central Ave	Newark	0.22	South	34.0	3	3				2259	25.1	A/B
T409	SantaClara - NB	I-580	Okland Ave	Oak	2.72	North	24.5	3	3				790	18.6	C/C
T410	MacArthur-SantaClara - WB	Seminary Ave	Grand Ave	Oak	2.20	North	25.6	3	3				53	13.9	C/E
T412	MacArthur-SantaClara - WB	Piedmont Ave	San Pablo Ave	Emery	2.19	North	42.9	3	3				578	16.4	C/D
T414	MacArthur-SantaClara - EB	Grand Ave	Seminary Ave	Oak	0.54	North	27.1	3	3				61	15.7	C/D
T415	MacArthur-SantaClara - SB	Seminary Ave	Estudillo Ave	Oak- San Leandro	0.26	Norh-Central	20.5	3	3				51	22.4	B/C
T416	El Charro Rd - SB	Stoneridge Dr	Bauch Rd	Plea	1.13	East	24.5	2	2				2579.0	24.3	B/C
T417	El Charro Rd - NB	Bauch Rd	Stoneridge Dr	Plea	0.15	East	21.0	2	2				2411.0	21	C/D

B.10 | HOV/Express Lanes - PM Peak Period (Floating Car Surveys)

Table B-10: 2018 LOS Monitoring Results for HOV/Express Lanes - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	2016 results			2018 Results		
								Sample	Speed	LOS	Sample	Speed	LOS
H1	I-80 - EB	Begin of HOV	I-80 HOV/GP Gore	Oak	North	0.69	1	6	7.2	F	6	14.2	F
H2	I-80 - EB	I-80 HOV/GP Gore	Powell (Overhead bridge)	Emery - Berk	North	0.56	1	6	4.7	F	6	5.8	F
H3	I-80 - EB	Powell (Overhead bridge)	Ashby (Interchange Center Point)	Emery - Berk	North	0.71	1	6	17.0	F	6	19.6	F
H4	I-80 - EB	Ashby (Interchange Center Point)	University (Overhead bridge)	Emery - Berk	North	1.3	1	6	25.7	F	6	28.6	F
H5	I-80 - EB	University (Overhead bridge)	I-80/580 Split (Divider)	Berk - Alb	North	1.37	1	6	44.6	D	6	44.3	D
H6	I-80 - EB	I-80/580 Split (Divider)	County Line	Berk - Alb	North	0.84	1	6	58.6	B	6	48.9	D
H7	I-80 - WB	County Line	I-580/80 Merge (Concrete Barrier)	Berk - Alb	North	0.7	1	6	64.5	A	6	60.8	A
H8	I-80 - WB	I-580/80 Merge (Concrete Barrier)	University (Overhead Bridge)	Berk - Alb	North	1.51	1	6	61.8	A	6	61.8	A
H9	I-80 - WB	University (Overhead Bridge)	Ashby (Interchance Center Point)	Emery - Berk	North	1.31	1	6	43.8	D	6	48.8	D
H10	I-80 - WB	Ashby (Interchance Center Point)	Powell (Overhead Bridge)	Emery - Berk	North	0.71	1	6	41.5	D	6	41.9	D
H11	I-80 - WB	Powell (Overhead Bridge)	I-80/I-580 (GP Lanes Split)	Emery - Berk	North	0.47	1	6	51.5	C	6	51.7	C
H12	I-80 - WB	I-580 Split (ramp)	Toll Plaza	Oak	North	1.31	1	6	49.9	C	6	53.7	C
H13	I-80 - WB	Toll Plaza	End of HOV	Oak	North	0.21	1	6	14.0	F	6	48.4	D
H14	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	South	1.02	1	6	63.0	A	6	58.7	B
H15	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	South	1.15	1	6	72.4	A	6	62.9	A
H16	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	South	0.54	1	6	65.6	A	6	57.7	B

Table B-10: 2018 LOS Monitoring Results for HOV/Express Lanes - PM Peak Period (Floating Car Surveys)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
H17	SR 92 - WB	Begin of HOV (Hesperian Blvd)	Clawiter	Hay	Central	1.17	1	6	68.9	A	6	65.0	A
H18	SR 92 - WB	Clawiter	Toll Plaza	Uninc - Hay	Central	1.88	1	6	67.2	A	6	61.0	A
E5	I-580 - EB	Hacienda	Santa Rita	Plea	East	1.9	2	-	-	-	-	43.9	D
E6	I-580 - EB	Santa Rita	El Charro	Uninc - Plea	East	1.25	2	-	-	-	-	58.3	B
E7	I-580 - EB	El Charro	SR 84/Airway Blvd.	Uninc	East	1.72	2	-	-	-	-	66.1	A
E8	I-580 - EB	SR 84/Airway Blvd.	Portola	Uninc	East	1.73	2	-	-	-	-	68.3	A
E9	I-580 - EB	Portola	1st St	Liv	East	2.56	2	-	-	-	-	62.9	A
E10	I-580 - EB	1st St	Greenville	Liv - Uninc	East	2.13	2	-	-	-	-	31.9	E
E11	I-580 - WB	Greenville	1st St	Liv - Uninc	East	2.13	1	-	-	-	-	74.0	A
E12	I-580 - WB	1st St	Portola	Liv	East	2.56	1	-	-	-	-	74.1	A
E13	I-580 - WB	Portola	SR 84/Airway Blvd.	Uninc	East	1.73	1	-	-	-	-	72.8	A
E14	I-580 - WB	SR 84/Airway Blvd.	El Charro	Uninc	East	1.73	1	-	-	-	-	72.5	A
E15	I-580 - WB	El Charro	Santa Rita/Tassajara	Uninc - Plea	East	1.25	1	-	-	-	-	81.3	A
E16	I-580 - WB	Santa Rita/Tassajara	I-680	Plea	East	2.8	1	-	-	-	-	73.5	A
E1	I-680 - SB	Begin of HOV (Rt 84)	Washington Blvd Entry Point	Uninc - Fre	South	5.76	1	5	67.0	A	6	75.0	A
E2	I-680 - SB	Washington Blvd Entry Point	Auto Mall Pkwy Exit Point	Fre	South	1.32	1	5	68.6	A	6	76.5	A
E3	I-680 - SB	Auto Mall Pkwy Exit Point	Mission Blvd Entry Point	Fre	South	1.06	1	5	69.2	A	6	76.7	A
E4	I-680 - SB	Mission Blvd Entry Point	Ala border (S of Scott Creek Rd)	Fre	South	3.03	1	5	70.6	A	6	76.4	A
H25	I-880 - NB	Begin HOV	I-880/I-80 Split (16th Street)	Oak	North	0.17	1	6	67.9	A	6	76.5	A
H26	I-880 - NB	I-880/I-80 Split (16th Street)	Toll Plaza	Oak	North	1.42	1	6	62.6	A	6	55.2	B
H27	I-880 - NB	Begin HOV (W Grand Ave)	I-880/I-80 Merge	Oak - Emery	North	1.11	1	6	36.8	E	6	40.8	E
H28	I-880 - NB	SCL County Line	SR 262/Mission (450 ft s/o Warren Ave Overhead Bridge)	Fre	South	2	1	6	28.7	F	6	29.0	F
H29	I-880 - NB	SR262/Mission (450 ft s/o Warren Ave Overhead Bridge)	AutoMall Pkwy (Overhead Bridge)	Fre	South	2.43	1	6	38.5	E	6	44.6	D
H30	I-880 - NB	AutoMall Pkwy (Overhead Bridge)	Stevenson Blvd (Overhead Bridge)	Fre	South	1.53	1	6	42.1	D	6	48.7	D
H31	I-880 - NB	Stevenson Blvd (Overhead Bridge)	Decoto (Overhead Bridge)	Fre	South	4.06	1	6	20.3	F	6	35.7	E
H32	I-880 - NB	Decoto (Overhead Bridge)	Alvarado Blvd (Overhead Bridge)	Fre	South	1.17	1	6	18.9	F	6	23.8	F
H33	I-880 - NB	Alvarado Blvd (Overhead Bridge)	Alvarado-Niles Rd (Overhead Bridge)	Fre- Uni Cty	South	1.57	1	6	24.0	F	6	23.3	F
H34	I-880 - NB	Alvarado-Niles Rd (Overhead Bridge)	Tennyson (Overhead Bridge)	Uni Cty - Hay	South	2.6	1	6	21.1	F	6	20.9	F
H35	I-880 - NB	Tennyson (Overhead Bridge)	SR 92 (Overhead Bridge)	Hay	Central	1.02	1	6	26.2	F	6	30.6	E

Table B-10: 2018 LOS Monitoring Results for HOV/Express Lanes - PM Peak Period (Floating Car Surveys)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
H36	I-880 - NB	SR 92 (Overhead Bridge)	A St (Overhead Bridge)	Hay	Central	1.68	1	6	35.9	E	6	37.8	E
H37	I-880 - NB	A St (Overhead Bridge)	End of HOV	Uninc	Central	0.78	1	6	52.2	C	6	52.0	C
H38	I-880 - SB	Marina Blvd (Overhead Bridge)	SR 238 WB (Merge)	San L	North	2.56	1	6	55.8	B	6	69.2	A
H39	I-880 - SB	SR 238 WB (Merge)	A St (Overhead Bridge)	San L-Uninc	Central	1.91	1	6	53.1	C	6	50.8	C
H40	I-880 - SB	A St (Overhead Bridge)	Rt 92/Jackson (Overhead Bridge)	Hay	Central	1.7	1	6	53.7	C	6	48.4	D
H41	I-880 - SB	Rt 92/Jackson (Overhead Bridge)	Tennyson (Overhead Bridge)	Hay	Central	1.01	1	6	47.4	D	6	53.6	C
H42	I-880 - SB	Tennyson (Overhead Bridge)	Alvarado-Niles (Overhead Bridge)	Hay - Uni Cty	Central	2.6	1	6	53.6	C	6	57.0	B
H43	I-880 - SB	Alvarado-Niles (Overhead Bridge)	Alvarado (Overhead Bridge)	Uni Cty - Fre	Central	1.56	1	6	65.6	A	6	61.6	A
H44	I-880 - SB	Alvarado (Overhead Bridge)	Decoto (Overhead Bridge)	Fre	Central	1.19	1	6	59.7	B	6	61.4	A
H45	I-880 - SB	Decoto (Overhead Bridge)	Stevenson (Overhead Bridge)	Fre	South	4.06	1	6	67.4	A	6	59.6	B
H46	I-880 - SB	Stevenson (Overhead Bridge)	AutoMall Pkwy (Overhead Bridge)	Fre	Central	1.52	1	6	71.1	A	6	64.9	A
H47	I-880 - SB	AutoMall Pkwy (Overhead Bridge)	Rt 262/Mission (Painted Gore)	Fre	Central	2.83	1	6	69.9	A	6	65.7	A
H48	I-880 - SB	SR 262/Mission (Painted Gore)	SCL County Line	Fre	South	1.6	1	6	71.7	A	6	63.8	A
H49	I-880 - SB	Begin HOV (South of Hegenberger)	SR 112/Davis	Oak-San L	North	1.64	1	6	62.4	A	6	54.5	C
H50	I-880 - SB	SR 112/Davis	Marina Blvd	San L	North	0.81	1	6	56.4	B	6	56.3	B

B.11 | HOV/Express Lanes - AM Peak Period (Floating Car Surveys)

Table B-11: 2018 LOS Monitoring Results for HOV/Express Lanes - AM Peak Period (Floating Car Surveys)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
H1	I-80 - EB	Begin of HOV	I-80 HOV/GP Gore	Oak	North	0.69	1	6	62.2	A	6	54.8	C
H2	I-80 - EB	I-80 HOV/GP Gore	Powell (Overhead bridge)	Emery - Berk	North	0.56	1	6	63.2	A	6	62.5	A
H3	I-80 - EB	Powell (Overhead bridge)	Ashby (Interchange Center Point)	Emery - Berk	North	0.71	1	6	67.4	A	6	63.0	A
H4	I-80 - EB	Ashby (Interchange Center Point)	University (Overhead bridge)	Emery - Berk	North	1.3	1	6	70.8	A	6	67.9	A
H5	I-80 - EB	University (Overhead bridge)	I-80/580 Split (Divider)	Berk - Alb	North	1.37	1	6	70.8	A	6	67.3	A
H6	I-80 - EB	I-80/580 Split (Divider)	County Line	Berk - Alb	North	0.84	1	6	66.2	A	6	62.7	A
H7	I-80 - WB	County Line	I-580/80 Merge (Concrete Barrier)	Berk - Alb	North	0.7	1	6	37.1	E	6	29.1	F
H8	I-80 - WB	I-580/80 Merge (Concrete Barrier)	University (Overhead Bridge)	Berk - Alb	North	1.51	1	6	33.3	E	6	29.1	F
H9	I-80 - WB	University (Overhead Bridge)	Ashby (Interchance Center Point)	Emery - Berk	North	1.31	1	6	34.3	E	6	39.6	E
H10	I-80 - WB	Ashby (Interchance Center Point)	Powell (Overhead Bridge)	Emery - Berk	North	0.71	1	6	31.5	E	6	38.5	E
H11	I-80 - WB	Powell (Overhead Bridge)	I-80/I-580 (GP Lanes Split)	Emery - Berk	North	0.47	1	6	32.6	E	6	51.5	C
H12	I-80 - WB	I-580 Split (ramp)	Toll Plaza	Oak	North	1.31	1	6	34.5	E	6	47.7	D

Table B-11: 2018 LOS Monitoring Results for HOV/Express Lanes - AM Peak Period (Floating Car Surveys)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
H13	I-80 - WB	Toll Plaza	End of HOV	Oak	North	0.21	1	6	48.2	D	6	49.4	C
H14	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	South	1.02	1	6	57.6	B	6	60.1	A
H15	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	South	1.15	1	6	58.0	B	6	45.5	D
H16	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	South	0.54	1	6	54.3	C	6	23.8	F
H17	SR 92 - WB	Begin of HOV (Hesperian Blvd)	Clawiter	Hay	Central	1.17	1	6	34.6	E	6	44.9	D
H18	SR 92 - WB	Clawiter	Toll Plaza	Uninc - Hay	Central	1.88	1	6	39.5	E	6	34.7	E
E5	I-580 - EB	Hacienda	Santa Rita	Plea	East	1.9	2	-	-	-	-	76.8	A
E6	I-580 - EB	Santa Rita	El Charro	Uninc - Plea	East	1.25	2	-	-	-	-	74.7	A
E7	I-580 - EB	El Charro	SR 84/Airway Blvd.	Uninc	East	1.72	2	-	-	-	-	72.7	A
E8	I-580 - EB	SR 84/Airway Blvd.	Portola	Uninc	East	1.73	2	-	-	-	-	72.9	A
E9	I-580 - EB	Portola	1st St	Liv	East	2.56	2	-	-	-	-	73.3	A
E10	I-580 - EB	1st St	Greenville	Liv - Uninc	East	2.13	2	-	-	-	-	74.0	A
E11	I-580 - WB	Greenville	1st St	Liv - Uninc	East	2.13	1	-	-	-	-	66.4	A
E12	I-580 - WB	1st St	Portola	Liv	East	2.56	1	-	-	-	-	64.0	A
E13	I-580 - WB	Portola	SR 84/Airway Blvd.	Uninc	East	1.73	1	-	-	-	-	56.4	B
E14	I-580 - WB	SR 84/Airway Blvd.	El Charro	Uninc	East	1.73	1	-	-	-	-	54.0	C
E15	I-580 - WB	El Charro	Santa Rita/Tassajara	Uninc - Plea	East	1.25	1	-	-	-	-	66.4	A
E16	I-580 - WB	Santa Rita/Tassajara	I-680	Plea	East	2.8	1	-	-	-	-	64.9	A
E1	I-680 - SB	Begin of HOV (Rt 84)	Washington Blvd Entry Point	Uninc - Fre	South	5.76	1	6	65.6	A	6	63.5	A
E2	I-680 - SB	Washington Blvd Entry Point	Auto Mall Pkwy Exit Point	Fre	South	1.32	1	6	66.2	A	6	61.0	A
E3	I-680 - SB	Auto Mall Pkwy Exit Point	Mission Blvd Entry Point	Fre	South	1.06	1	6	53.3	C	6	67.0	A
E4	I-680 - SB	Mission Blvd Entry Point	Ala border (S of Scott Creek Rd)	Fre	South	3.03	1	6	68.3	A	6	69.3	A
H25	I-880 - NB	Begin HOV	I-880/I-80 Split (16th Street)	Oak	North	0.17	1	6	70.3	A	6	70.6	A
H26	I-880 - NB	I-880/I-80 Split (16th Street)	Toll Plaza	Oak	North	1.42	1	6	60.8	A	6	44.7	D
H27	I-880 - NB	Begin HOV (W Grand Ave)	I-880/I-80 Merge	Oak - Emery	North	1.11	1	6	60.1	A	6	58.7	B
H28	I-880 - NB	SCL County Line	SR 262/Mission (450 ft s/o Warren Ave Overhead Bridge)	Fre	South	2	1	6	71.1	A	6	62.0	A
H29	I-880 - NB	SR262/Mission (450 ft s/o Warren Ave Overhead Bridge)	AutoMall Pkwy (Overhead Bridge)	Fre	South	2.43	1	6	69.0	A	6	64.8	A
H30	I-880 - NB	AutoMall Pkwy (Overhead Bridge)	Stevenson Blvd (Overhead Bridge)	Fre	South	1.53	1	6	70.4	A	6	58.8	B
H31	I-880 - NB	Stevenson Blvd (Overhead Bridge)	Decoto (Overhead Bridge)	Fre	South	4.06	1	6	70.2	A	6	62.2	A
H32	I-880 - NB	Decoto (Overhead Bridge)	Alvarado Blvd (Overhead Bridge)	Fre	South	1.17	1	6	71.5	A	6	70.2	A

Table B-11: 2018 LOS Monitoring Results for HOV/Express Lanes - AM Peak Period (Floating Car Surveys)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
H33	I-880 - NB	Alvarado Blvd (Overhead Bridge)	Alvarado-Niles Rd (Overhead Bridge)	Fre- Uni Cty	South	1.57	1	6	69.3	A	6	59.9	B
H34	I-880 - NB	Alvarado-Niles Rd (Overhead Bridge)	Tennyson (Overhead Bridge)	Uni Cty - Hay	South	2.6	1	6	67.9	A	6	56.3	B
H35	I-880 - NB	Tennyson (Overhead Bridge)	SR 92 (Overhead Bridge)	Hay	Central	1.02	1	6	65.1	A	6	61.2	A
H36	I-880 - NB	SR 92 (Overhead Bridge)	A St (Overhead Bridge)	Hay	Central	1.68	1	6	66.7	A	6	58.2	B
H37	I-880 - NB	A St (Overhead Bridge)	End of HOV	Uninc	Central	0.78	1	6	67.3	A	6	49.2	C
H38	I-880 - SB	Marina Blvd (Overhead Bridge)	SR 238 WB (Merge)	San L	North	2.56	1	6	59.6	B	6	75.8	A
H39	I-880 - SB	SR 238 WB (Merge)	A St (Overhead Bridge)	San L-Uninc	Central	1.91	1	6	56.9	B	6	42.9	D
H40	I-880 - SB	A St (Overhead Bridge)	Rt 92/Jackson (Overhead Bridge)	Hay	Central	1.7	1	6	56.1	B	6	41.0	E
H41	I-880 - SB	Rt 92/Jackson (Overhead Bridge)	Tennyson (Overhead Bridge)	Hay	Central	1.01	1	6	44.1	D	6	35.0	E
H42	I-880 - SB	Tennyson (Overhead Bridge)	Alvarado-Niles (Overhead Bridge)	Hay - Uni Cty	Central	2.6	1	6	51.8	C	6	27.2	F
H43	I-880 - SB	Alvarado-Niles (Overhead Bridge)	Alvarado (Overhead Bridge)	Uni Cty - Fre	Central	1.56	1	6	52.4	C	6	29.0	F
H44	I-880 - SB	Alvarado (Overhead Bridge)	Decoto (Overhead Bridge)	Fre	Central	1.19	1	6	50.2	C	6	32.2	E
H45	I-880 - SB	Decoto (Overhead Bridge)	Stevenson (Overhead Bridge)	Fre	South	4.06	1	6	46.4	D	6	32.8	E
H46	I-880 - SB	Stevenson (Overhead Bridge)	AutoMall Pkwy (Overhead Bridge)	Fre	Central	1.52	1	6	54.0	C	6	49.3	C
H47	I-880 - SB	AutoMall Pkwy (Overhead Bridge)	Rt 262/Mission (Painted Gore)	Fre	Central	2.83	1	6	56.4	B	6	48.8	D
H48	I-880 - SB	SR 262/Mission (Painted Gore)	SCL County Line	Fre	South	1.6	1	6	73.6	A	6	46.7	D
H49	I-880 - SB	Begin HOV (South of Hegenberger)	SR 112/Davis	Oak-San L	North	1.64	1	6	68.3	A	6	60.4	A
H50	I-880 - SB	SR 112/Davis	Marina Blvd	San L	North	0.81	1	6	67.5	A	6	64.4	A

B.12 | Bridges - PM Peak Period (INRIX Data)

Table B-12: 2018 LOS Monitoring Results for Bridges - PM Peak Period (INRIX Data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F151	SR 92 - WB	San M CL	Foster City Boulevard	SM	4.97	Central	3	3200	65.8	A	1311	68.6	A
F152	SR 92 - EB	Foster City Boulevard	San M CL	SM	4.97	Central	3	3200	34.4	E	1311	35.3	E
F153	SR 84 - WB	San M CL	Ravenswood Slough	SM	1.31	South	3	3101	60.0	A	3680	62.88	A
F154	SR 84 - EB	Ravenswood Slough	San M CL	SM	1.31	South	3	3200	45.3	D	3706	48.2	D
F155	I-80 - WB	SF County Line	Fremont St Off Ramp	SF	3.32	North	5	2960	25.8	(F30)	3467	19.3	(F20)
F156	I-80 - EB	Bryant St On Ramp	SF County Line	SF	3.29	North	5	2960	33.5	E	3551	38.1	E

B.13 | Bridges - AM Peak Period (INRIX Data)

Table B-13: 2018 LOS Monitoring Results for Bridges - AM Peak Period (INRIX Data)

								2016 results			2018 Results		
CMP ID	CMP Route	From	To	Jurisdiction	Plan Area	Length (mi)	# Lanes	Sample	Speed	LOS	Sample	Speed	LOS
F151	SR 92 - WB	San M CL	Foster City Boulevard	SM	4.97	Central	3	2914	44.4	D	1313	41.2	D
F152	SR 92 - EB	Foster City Boulevard	San M CL	SM	4.97	Central	3	2675	67.4	A	1313	68.9	A
F153	SR 84 - WB	San M CL	Ravenswood Slough	SM	1.31	South	3	3026	30.0	E	3706	28.6	(F30)
F154	SR 84 - EB	Ravenswood Slough	San M CL	SM	1.31	South	3	2895	59.4	B	3692	61.9	A
F155	I-80 - WB	SF County Line	Fremont St Off Ramp	SF	3.32	North	5	2797	35.4	E	3466	41.8	D
F156	I-80 - EB	Bryant St On Ramp	SF County Line	SF	3.29	North	5	2797	52.5	C	3586	57.7	B

B.14 | Tier 2 - NRIX Unavailable

Table B-14: 2018 LOS Monitoring New Tier 2 - INIRIX Unavailable

CMP ID	CMP Route	From	To	Length (mi)
T196	20th Street	San Pablo Avenue	Harrison Street	0.51
T199	29th Avenue	Ford St	International/E 14th	0.52
T201	42nd Avenue-Courtland	International Blvd	High Street	0.37
T203	55th Street	Market Street	Shattuck Avenue	0.52
T204	5th Street	Adeline Street	Oak Street	1.32
T205	6th Street	Adeline Street	Oak Street	1.32
T206	73rd Avenue	MacArthur Blvd	I-580	0.79
T207	7th Street-E 8th Street	I-880	14th Avenue	3.43
T212	Altamont Pass Road-Grant Line	Vasco Road	County Line	0.49
T213	AltamontPass-Grant Line	Vasco Road	County Line	0.90
T216	B Street	Mission Boulevard	Foothill Boulevard	0.20
T219	Broadway	Encinal Avenue	Tilden Way	0.55
T221	Bush Street	San Pablo Avenue	7th Street	0.87
T222	C Street	Mission Boulevard	Foothill Boulevard	0.19
T223	Carlos Bee Blvd-Hayward Blvd	Campus Drive	Mission Boulevard	0.93
T227	Cherry-Boyce-Cushing	Thornton	Avenue to I-880	5.67
T228	Claremont Avenue	Telegraph Avenue	Ashby Avenue	2.62
T230	Constitution Way-8th Street	Webster Street	Central Avenue	0.95
T231	Dublin Boulevard	Tassajara Road	Fallon Road	1.24

Table B-14: 2018 LOS Monitoring New Tier 2 - INIRIX Unavailable

CMP ID	CMP Route	From	To	Length (mi)
T232	Durant Avenue	Shattuck Avenue	College Avenue	0.73
T234	E 12th Street	40th St	Lake Merritt Blvd	2.82
T239	Fallon Road	I-580	Tassajara Road	2.85
T240	Fernside Boulevard	High Street	Otis-Dollitle Drive	1.15
T243	Fremont Boulevard	I-880	County Line	3.01
T250	Industrial Pkwy Southwest	Whipple Road	Industrial Pkwy West	1.95
T251	Isabel Avenue	Porla Avenue	Airway Boulevard	0.85
T256	Main St-Santa Rita Rd	Bernal Avenue	Stoneridge Drive	3.10
T262	Mowry Avenue	Cherry Street	I-880	0.78
T263	Neal Street	Santa Rita Road	Sunol Blvd	0.13
T264	North Canyons Parkway-Portola	Airway Boulevard	1st Street	4.20
T265	Osgood Road-WarmSpringsBlvd	Fremont/Washington	County Line	5.48
T266	Otis Drive	Park Street	Broadway	0.24
T276	San Pablo Avenue	I-580	16th Street	1.70
T277	Santa Clara Avenue	Webster Street	Broadway	2.28
T279	Shattuck Avenue	University Avenue	Marin Avenue	1.27
T280	Solano Avenue	San Pablo Boulevard	Sutter Street	1.47
T287	Tilden Way	Fruitvale Avenue	Park Street	0.80
T288	UC Blvd-Ardenwood-Newark Blvd	Alvarado Blvd	SR 84	3.57
T293	Walnut Avenue	Fremont Boulevard	Mission Boulevard	1.83
T294	Warren Avenue	Warm Springs Blvd	Fremont Blvd	1.04
T297	Whipple Road	Union City Boulevard	Mission Boulevard	3.43
T302	20th Street	San Pablo Avenue	Harrison Street	0.51
T305	29th Avenue	Ford St	International/E 14th	0.52
T307	42nd Avenue-Courtland	International Blvd	High Street	0.37
T309	55th Street	Market Street	Shattuck Avenue	0.52
T310	5th Street	Adeline Street	Oak Street	1.32
T311	6th Street	Adeline Street	Oak Street	1.32
T312	73rd Avenue	MacArthur Blvd	I-580	0.79
T317	Altamont Pass Road-Grant Line	Vasco Road	County Line	0.49
T318	AltamontPass-Grant Line	Vasco Road	County Line	0.90
T321	B Street	Mission Boulevard	Foothill Boulevard	0.20

Table B-14: 2018 LOS Monitoring New Tier 2 - INIRIX Unavailable

CMP ID	CMP Route	From	To	Length (mi)
T324	Broadway	Encinal Avenue	Tilden Way	0.55
T326	C Street	Mission Boulevard	Foothill Boulevard	0.19
T327	Carlos Bee Blvd-Hayward Blvd	Campus Drive	Mission Boulevard	0.93
T330	Cherry-Boyce-Cushing	Thornton Avenue	I-880	5.67
T331	Claremont Avenue	Telegraph Avenue	Ashby Avenue	2.62
T333	Constitution Way-8th Street	Webster Street	Central Avenue	0.95
T334	Dublin Boulevard	Tassajara Road	Fallon Road	1.24
T335	Durant Avenue	Shattuck Avenue	College Avenue	0.73
T337	E 12th Street	Lake Merritt Blvd	High Street	3.00
T342	Fallon Road	I-580	Tassajara Road	2.85
T343	Fernside Boulevard	High Street	Otis-Dollitle Drive	1.15
T346	Fremont Boulevard	I-880	County Line	3.01
T353	Industrial Pkwy Southwest	Whipple Road	Industrial Pkwy West	1.95
T354	Isabel Avenue	Porla Avenue	Airway Boulevard	0.85
T365	Mowry Avenue	Cherry Street	I-880	0.78
T366	Neal Street	Santa Rita Road	Sunol Blvd	0.13
T367	North Canyons Parkway-Portola	Airway Boulevard	1st Street	4.20
T368	Osgood Road-WarmSpringsBlvd	Fremont/Washington	County Line	5.48
T369	Otis Drive	Park Street	Broadway	0.24
T380	Santa Clara Avenue	Webster Street	Broadway	2.28
T382	Shattuck Avenue	University Avenue	Marin Avenue	1.18
T383	Solano Avenue	San Pablo Boulevard	Sutter Street	1.47
T385	Stoneridge Dr-Jack London Blvd	Isabel Avenue	Santa Rita Rd	2.50
T390	Tilden Way	Fruitvale Avenue	Park Street	0.80
T396	Walnut Avenue	Fremont Boulevard	Mission Boulevard	1.83
T397	Warren Avenue	Warm Springs Blvd	Fremont Blvd	1.04
T400	Whipple Road	Union City Boulevard	Mission Boulevard	3.43
T404	Stoneridge Dr-Jack London Blvd	Santa Rita Rd	Isabel Avenue	4.34
T408	UC Blvd-Ardenwood-Newark Blvd	SR 84	Alvarado Blvd	3.57
T411	MacArthur-SantaClara	Grand Ave	Piedmont Ave	0.74
T413	MacArthur-SantaClara	Piedmont Avenue	Grand Ave	1.08

Appendix C | 2018 Updates to the CMP network

This appendix documents changes to the CMP network observed during the 2016 LOS monitoring cycle. Other minor descriptions were updated as appropriate, but are not recorded here. There were no major changes to the Tier 1 Arterials or Tier 2 Arterials this analysis cycle.

C.1 | Tier 1 Freeways

There were no changes to the Tier 1 Freeway network.

C.2 | Tier 1 Arterials

There were no changes to the Tier 1 Arterial network.

C.3 | HOV and Express Lanes

In the 2018 monitoring cycle the following HOV/Express Lanes were added.

Table C-1: 2018 HOV and Express Lanes

Route / Direction	HOV	EL*	Description	Length (mi)
880/SB	✓		Begin of HOV South of Hegenberger to Marina Blvd.	2.4
580/WB	✓		Greenville to I-680	12.2
	✓		Hacienda to Greenville	11.3

*EL: Express Lane

Similar to the comment above in the freeway section, the new express lanes on I-580 were not monitored because they are still in the ramp up period. In the next monitoring cycle, monitoring will continue as normal in the eastbound direction. For the westbound direction, the new express lanes were constructed anew, rather than by converting existing HOV lanes. For this reason, in the next monitoring cycle, new CMP segments should be developed to cover this new section of managed lane. Consistent with the 2016 monitoring cycle, HOV lanes on arterials or ramps were considered out of scope.

C.4 | Tier 2 Arterials

In the 2018 monitoring cycle, the following Tier 2 Arterials were added.

Table C-2: 2018 Tier 2 Arterials

CMP Route	From	To	Length (mi)	CMP Route	From	To	Length (mi)
14th Ave - EB	E 8th St	Foothill Blvd	0.26	98th Ave - WB	I-580	Airport Access Rd	3.25
14th St-Lake Merritt Blvd - WB	12th St	Bush St	1.13	Airport Access Rd - SB	Hegenberger Rd	Dollittle Dr	0.32
23rd Ave - NB	23rd Ave NB/SB Split	E 11th	0.15	Altamont Pass Rd- Grant Line - WB	County Line (WB)	Greenville Rd	9.71
23rd Ave - SB	E 12th St	23rd Ave NB/SB Split	0.14	Alvarado- Niles/Smith/Niles Blvd -WB	Mission Blvd	Union City Blvd	6.89
40th St- Shellmound Ave - WB	Broadway	Powell Blvd	1.31	Auto Mall Parkway - WB	I-880	Cherry St	0.75
52nd St - WB	Telegraph Ave	Shattuck	0.11	Bernal Ave - WB	Sunol Blvd/First St	I-680	1.37
8th St - WB	Harrison	Broadway	0.22	Broadway - SB	SR-24	College Ave	0.94
98th Ave - EB	Airport Access Rd	I-580	3.25	Buchanan St- Marin Ave - WB	Arlington/Del Nort	I-80	2.12
Airport Access Rd - NB	Dollittle Dr	Hegenberger Rd	0.32	Castro Valley Blvd-Mattox - WB	Crow Canyon Rd	Mission Blvd	2.70
Altamont Pass Rd-Grant Line - EB	Greenville Rd	County Line (EB)	9.71	Central Ave - SB	I-880	Cherry St	0.85
Alvarado- Niles/Smith/ Niles Blvd - EB	Union City Blvd	Mission Blvd	6.89	Clawiter Rd - NB	Winton Ave	SR-92	1.75
Auto Mall Parkway - EB	Cherry St	I-880	0.75	Dyer St - NB	Alvarado Blvd	Whipple Rd	1.15
Bernal Ave - EB	Bernal Ave	Sunol Blvd/First St	1.37	E 18th St - WB	Park Blvd	Lakeshore Ave	0.22
Broadway - NB	College Ave	SR24	0.94	East Ave - WB	Vasco Rd	Livermore Ave	2.53
Buchanan St- Marin Ave - EB	I-80	Arlington/Del Norte	2.12	El Charro Rd - SB	I-580	Stoneridge Dr	0.26
Casto St - NB	7th St	San Pablo Ave	0.77	Estudillo Ave - WB	MacArthur Blvd	E 14th St	0.98
Castro Valley Blvd-Mattox - EB	Mission Blvd	Crow Canyon Rd	2.70	First St - WB	Stoneridge Dr	I-580	0.88
Central Ave - NB	Cherry St	I-880	0.85	Foothill Rd - SB	I-580	Stoneridge Dr	0.74
Clawiter Rd - SB	Winton Ave	SR-92	1.75	Fruitvale Ave - SB	MacArthur Blvd	Tilden Way	2.37
Dyer St - SB	Whipple Rd	Alvarado Blvd	1.15	Gilman St - WB	San Pablo Blvd	I-80	0.63
E 18th St - EB	Lakeshore Ave	Park Blvd	0.22	Gimmer Blvd - NB	Mission Blvd	Paseo Padre Parkway	5.08
East Ave - EB	Livermore Ave	Vasco Rd	2.53	Harrison St-Oakland Ave - SB	MacArthur Blvd	20th St	0.99
El Charro Rd - NB	Stoneridge Dr	I-580	0.26	High St - WB	MacArthur Blvd	I-580	0.05
Estudillo Ave - EB	E 14th St	MacArthur Blvd	0.98	Industrial Blvd-Pkwy West - WB	Mission Blvd	Clawiter Rd	5.16
First St - EB	Stanley Blvd	Railroad Ave	0.88	Lewelling Blvd - WB	Mission Blvd	Hespedian Blvd	1.42
Foothill Rd - NB	Stoneridge Dr	I-580	0.74	Lewelling Blvd - EB	Wicks Blvd	Hespedian Blvd	1.53
Fruitvale Ave - NB	Tilden Way	MacArthur Blvd	2.37	Livermore Ave - SB	I-580	Tesla Rd	3.29
Gilman St - EB	I-80	San Pablo Blvd	0.63	MacArthur- Santa Clara - EB	San Pablo Ave	Piedmont Ave	1.56
Gimmer Blvd - SB	Paseo Padre Pkwy	Mission Blvd	5.08	Main St-Santa Rita Rd - SB	Stoneridge Dr	Bernal Ave	3.10
Harrison St- Oakland Ave - EB	20th St	MacArthur Blvd	0.99	Marina Blvd - EB	Dollittle Dr	Washington Ave	1.80
High St - NB	I-580	MacArthur Blvd	0.05	Market St - SB	Stanford Ave	55th St	0.36
Industrial Blvd- Pkwy West - EB	Clawiter Rd	Mission Blvd	5.06	Martin Luther King Jr Way - SB	Marin Ave	Adeline St	2.67

CMP Route	From	To	Length (mi)	CMP Route	From	To	Length (mi)
Lewelling Blvd - EB	Hesperian Blvd	Hespedian Blvd	1.42	Martin Luther King Jr Way - SB	47th St	San Pablo Ave	1.78
Lewelling Blvd - WB	Hesperian Blvd	Wicks Blvd	1.53	Mission Blvd - NB	I-680	I-680	3.01
Livermore Ave- NB	Tesla Rd	I-580	3.29	Owens Dr - WB	W Las Positas Blvd	Willow Rd	1.10
MacArthur- SantaClara - WB	Estudillo Ave	Seminary Ave	4.36	Park Blvd - WB	SR-13	E 18th St	3.12
Marina Blvd- WB	Washington Ave	Dollitle Dr	1.80	Park St - SB	Encinal Ave	Otis Dr	0.42
Market St - NB	55th St	Stanford Ave	0.36	Paseo Padre Parkway - EB	Peralta Blvd	Grimmer Blvd	2.30
Martin Luther King Jr Way - NB	Adeline St	Marin Ave	2.67	Paseo Padre Parkway - WB	SR-84	Ardenwood Blvd	1.50
Martin Luther King Jr Way - NB	San Pablo Ave	47th St	1.78	Patterson Pass Rd- WB	County Line	Vasco Rd	10.11
Mission Blvd- SB	I-680	I-680	3.01	Redwood Rd - SB	Castro Valley Boul	I-580	0.38
Owens Dr - EB	Willow Rd	W Las Positas Blvd	1.10	San Leandro Blvd - NB	E 14th St	San Leandro/Oakland	2.18
Park Blvd - EB	E. 18th St	SR-13	3.12	San Leandro St - WB	Oakland//SL border	Fruitvale Ave	4.33
Park St - NB	Otis Dr	Encinal Ave	0.42	San Pablo Ave - SB	I-580	16th St	1.70
Paseo Padre Parkway - WB	Grimmer Blvd	Peralta Blvd	2.30	Seminary Ave - WB	I-580	MacArthur Blvd	0.67
Paseo Padre Parkway - EB	Sr-84	Ardenwood Blvd	1.50	Stevenson Blvd - SB	Mission Blvd	Cherry St	4.02
Patterson Pass Rd - EB	Vasco	County Line	10.11	Telegraph Ave - SB	51st St	Broadway	2.25
Redwood Rd - NB	I-580	Catro Valley Boul	0.38	Tennyson Rd - EB	Industrial Blvd	Hespedian Blvd	0.60
San Leandro Blvd- EB	San Leandro/Oakland	E 14th St	2.18	Tesla Rd - WB	County Line	Livermore Ave	11.93
San Leandro St - EB	Fruitvale Ave	Oakland//SL border	4.33	Thornton Ave - WB	I-880	SR-84	3.73
Seminary Ave- EB	MacArthur Blvd	I-580	0.67	UC Blvd-Ardenwood- Newark Blvd - WB	Central Ave	SR 84	2.15
Stevenson Blvd - NB	Cherry St	Mission Blvd	4.02	Vallecitos Rd - SB	1st St	SR-84	3.32
Stoneridge Dr- Jack London Blvd-WB	Hopyard Rd	Foothill Rd	1.52	Vasco Rd - NB	Tesla Rd	I-580	3.11
Telegraph Ave- NB	Broadway	51st St	2.25	Village Parkway - SB	County Line	Dublin Blvd	1.50
Tennyson Rd - WB	Hesperian Blvd	Industrial Blvd	0.60	W Las Positas Blvd - WB	Santa Rita Rd	Owens Dr	0.22
Tesla Rd - WB	Livermore Ave	County Line (EB)	11.93	Washington Ave- SB	Juana Ave	Lewelling Blvd	2.72
Thornton Ave - EB	SR-84	I-880	3.73	Washington Blvd - EB	Fremont Blvd	Mission Blvd	2.20
Vallecitos Rd - NB	SR-84	1st St	3.32	Wicks Blvd-Merced St - NB	Lewelling Blvd	Marina Blvd	2.19
Vasco Rd - SB	I-580	Tesla Rd	4.05	Winton Ave - EB	Clawiter Rd	Hespedian Blvd	0.54
Village Parkway - NB	Dublin Blvd	County Line	1.50	Stoneridge Dr-Jack London Blvd - WB	Santa Rita Rd	Hopyard Rd	1.56
W Las Positas Blvd- EB	Owens Dr	Santa Rita Rd	0.22	Stoneridge Dr-Jack London Blvd - EB	Hopyard Rd	Santa Rita Rd	1.56
Washington Ave - NB	Lewelling Blvd	Juana Ave	2.72	Stoneridge Dr-Jack London Blvd - EB	Foothill Blvd	Hopyard Rd	1.52
Washington Blvd - WB	Mission Blvd	Fremont Blvd	2.20	UC Blvd-Ardenwood- Newark Blvd - EB	SR 84	Central Ave	2.15
Wicks Blvd- Merced St - SB	Marina Blvd	Lewelling Blvd	2.19	Santa Clara - NB	I-580	Oakland Ave	0.82
Winton Ave - WB	Hesperian Blvd	Clawiter Rd	0.54	MacArthur- Santa Clara - WB	Seminary Ave	Grand Ave	4.79
14th Ave - WB	Foothill Blvd	E 8th St	0.26	MacArthur- Santa Clara - WB	Piedmont Ave	San Pablo Ave	1.56
14th St-Lake Merritt Blvd - EB	Brush St	12th St	1.13	MacArthur- Santa Clara - EB	Grand Ave	Seminary Ave	4.77
23rd Ave - SB	E 11th	23rd Ave NB/SB Split	0.15	MacArthur- SantaClara - SB	Seminary Ave	Estudillo Ave	0.32
23rd Ave - NB	23rd Ave NB/SB Split	E 12 St	0.14	El Charro Rd - SB	Stoneridge Dr	Bauch Rd	0.09
40th St- Shellmound Ave - EB	Powell Blvd	Broadway	1.31	El Charro Rd - NB	Bauch Rd	Stoneridge Dr	0.09
52nd St - EB	Shattuck Ave	Telegraph Ave	0.11	7th St-E 8th St - EB	I-880	14th Ave	3.43

Appendix D | Corridor Analysis

D.1 | Comparison of PM Peak Period Travel Time & Speed on Selected Freeway Routes (1991-2018)

CMP Route	Dir	From	To	Length (mi)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
I-80	EB	Tollgate	Central	6.35	15:56	18:24	17:19	18:23	18:50	14:18	19:45	12:03	17:05	18:52	13:51	17:53	15:48	19:33	17:39
					23.5	20.4	21.7	20.8	20.2	26.6	19.3	31.6	23.1	20.9	28.5	22.1	23.0	18.6	20.6
	WB	Central	Tollgate	6.11	14:27	15:26	15:41	14:53	13:07	20:52	16:33	13:10	12:38	9:38	12:51	11:52	14:01	13:08	10:58
					25.3	23.7	23.3	24.6	28.0	17.6	22.2	27.8	27.7	36.2	27.2	25.9	25.7	27.4	32.9
I-580	EB	SR-238/Foothill	I-205	30.33	32:55	33:40	33:37	33:04	n/a	49:25	59:43	53:22	45:46	47:41	51:57	39:36	44:13		58:59
					56.3	55.0	55.1	55.0	n/a	40.5	30.5	34.1	36.8	34.5	30.8	40.4	41.4		31.0
	WB	I-205	SR-238/Foothill	30.15	32:10	33:05	32:07	29:30	n/a	33:09	33:10	30:02	30:35	29:03	27:13	27:04	28:47		28:29
					57.2	55.6	55.1	55.0	n/a	55.0	54.5	60.2	58.6	61.4	65.6	64.7	63.1		63.8
I-580	EB	I-80/I-580 Split	I-238	15.88	18:18	18:35	21:53	18:13	16:16	15:21	17:45	22:15	0:26	19:27	22:55	22:07	23:08	26:59	26:48
					52.6	51.8	44.0	53.2	60.0	62.7	54.7	42.8	39.3	47.0	41.8	40.6	39.9	34.2	34.5
	WB	I-238	I-80	14.73	16:11	16:50	18:20	15:36	14:58	14:36	15:25	15:37	15:58	14:05	15:16	15:59	15:33	16:34	16:07
					57.7	55.5	51.0	52.2	61.2	62.8	59.5	56.6	55.2	62.6	59.9	53.9	60.3	56.6	58.2
I-680	NB	Scott Creek	Alcosta(on)	21.13	21:59	22:59	22:31	24:16	25:07	21:54	24:39	30:21	23:48	29:14	31:39	30:19	42:54	54:50	47:55
					58.1	56.7	56.7	52.2	50.5	58.2	51.4	41.8	52.9	43.4	40.1	41.8	29.8	23.3	26.7
	SB	Alcosta(on)	Scott Creek	21.3	21:45	22:05	23:23	21:04	19:06	20:13	20:44	19:27	21:51	20:10	19:24	19:30	19:10	19:19	19:11
					59.0	58.1	54.9	60.6	66.8	63.2	61.6	65.7	58.5	63.4	65.9	65.6	66.8	66.3	66.7
I-880	NB	Dixon Landing	I-980	31.41	16:49	17:15	18:37	2:26	1:21	17:26	2:20	14:23	17:50	19:10	20:20	20:19	47:41	4:46	56:45
					44.8	44.4	42.9	45.5	38.8	47.5	37.5	49.1	44.6	43.2	42.1	42.1	39.6	29.2	33.3
	SB	I-980	Dixon Landing	30.85	17:55	20:41	23:36	16:31	13:19	16:48	21:46	21:57	1:53	14:53	16:06	13:59	41:00	46:36	46:45
					43.0	40.4	37.9	45.8	49.7	49.1	40.5	38.6	37.1	47.6	46.2	48.1	46.0	40.5	40.4
SR13	NB	Mountain	Hiller	5.43	6:12	6:40	6:51	6:45	6:06	6:24	6:27	9:25	8:42	6:10	7:38	8:58	11:27	11:01	9:14
					53.6	49.9	48.5	48.1	53.2	50.9	50.4	34.6	38.8	51.0	41.3	35.1	30.4	31.6	37.7

D.2 | Comparison of PM Peak Period Travel Time & Speed on Selected Arterial Routes (1991-2018)

CMP Route	Dir	From	To	Length (mi)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
Hesperian	NB	Tennyson	14th St.	5.5	19:35	19:19	18:40	16:06	17:18	18:10	22:00	22:10	0:55	1:09	22:04	23:33	22:53	25:56	20:48
					17.2	17.5	18.1	20.5	19.5	17.3	15.3	14.9	13.4	13.4	14.8	14.3	14.8	13.0	16.2
	SB	14th St.	Tennyson	5.6	17:20	16:05	17:38	16:10	16:13	16:41	17:24	17:33	18:13	20:29	21:44	20:19	19:24	19:49	18:44
					19.4	20.9	19.1	20.7	20.7	19.5	19.3	19.1	18.5	16.4	15.5	16.8	17.4	17.0	18.0
SR 13 Ashby	EB	I-80	Hiller	3.77	15:17	13:19	13:40	13:40	14:26	16:57	15:04	16:47	15:44	14:08	17:52	16:16	17:02	15:54	13:44
					14.7	16.9	16.5	16.5	15.6	13.4	15.0	13.5	14.4	16.0	16.0	13.9	13.5	14.4	16.7
	WB	Hiller	I-80	3.8	14:13	13:09	13:49	15:09	14:06	5:16	16:36	15:27	14:00	13:29	14:30	16:14	15:46	14:58	14:49
					16.0	17.2	16.4	15.0	16.1	15.9	13.8	14.7	16.3	16.9	15.7	14.0	14.6	15.4	15.5

CMP Route	Dir	From	To	Length (mi)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
SR 61	SB	Atlantic	Davis	7.57	18:40	18:07	18:30	19:36	19:01	17:41	19:47	20:59	18:46	17:25	19:25	20:05	22:42	20:37	20:23
					24.9	25.0	24.5	23.1	23.9	29.4	23.0	21.6	24.2	26.1	23.4	22.6	20.1	22.2	22.4
	NB	Davis	Atlantic	7.57	19:32	18:38	18:41	18:58	19:24	19:17	18:49	20:20	19:29	16:55	18:21	19:01	21:04	21:14	19:49
					24.3	25.5	25.5	24.1	23.4	25.6	24.1	22.3	23.3	26.9	24.7	23.9	21.7	21.5	23.1
SR 84 Fremont	WB	SR-238	I-880 SB	4.3	10:07	8:27	10:56	6:28	11:42	10:23	11:33	9:48	9:49	9:51	10:33	9:41	10:13	11:03	9:41
					25.0	30.5	23.5	24.1	22.0	24.9	22.3	26.3	26.3	26.2	23.1	25.1	23.9	22.0	25.1
	EB	I-880 SB	SR-238	4.3	11:21	10:24	11:45	11:38	12:56	14:31	11:58	10:43	11:29	11:15	12:17	11:57	11:17	12:17	12:11
					24.3	24.8	21.9	18.7	19.9	16.6	21.5	24.1	22.5	22.9	20.1	20.7	21.7	19.9	20.1
SR 84 Livermore (old alignment along Airway)	WB	I-580 WB	Isabel	5.22	9:20	10:36	9:27	11:03	11:01	10:20	10:45	5:30	7:43	7:25	7:51	7:54	10:29	10:36	9:07
					32.4	28.5	32.0	27.4	27.5	10.2	23.1	38.5	40.7	38.2	39.9	39.7	29.9	29.6	34.3
	EB	Isabel	I-580 WB	5.22	11:32	10:32	10:23	10:46	11:12	11:57	11:25	5:46	8:34	8:25	9:30	9:46	9:23	9:09	8:56
					26.2	28.7	29.1	28.1	27.0	22.6	21.8	36.8	36.6	35.8	33.0	32.1	33.4	34.2	35.0
SR 84 Livermore (new alignment at I-580)	WB	I-580 WB	Isabel	4.69													9:04	10:09	8:23
																	31.0	27.7	33.6
	EB	Isabel	I-580 WB	4.68													8:18	8:24	7:54
																	33.9	33.4	35.5
SR 123	SB	Carlson	35th St.	5.45	16:26	16:32	14:22	18:09	18:15	18:48	17:22	17:38	22:38	19:53	17:37	20:08	20:40	23:29	18:45
					19.0	19.7	22.7	18.0	17.9	17.4	18.8	18.5	14.5	16.5	18.6	16.2	15.1	13.3	16.6
	NB	35th St.	Carlson	5.46	16:56	15:32	18:12	17:42	2:00	18:36	22:39	19:56	22:53	23:36	17:59	20:53	22:11	24:31	21:54

Appendix E | Technical Details for Commercial Speed Data Processing

The commercial speed data processing, which ultimately converted the raw Traffic Message Channel (TMC) link data into average peak period speeds on every CMP segment, consisted of four steps described in Figure E-1.

Figure E-1: Data Analysis Procedures for Commercial Speed Data

Further explanation of each step is provided below.

E.1 | Step 1. Mapping TMC links onto CMP Segments

Commercial speed data collected by INRIX was reported against lengths of roadway called TMC links. TMC links are typically short links of roadway averaging 0.4-mile in length (range: 19 feet to 4.2 miles)[15].

For this project, it was required that the average speed be reported against an Alameda CTC CMP segment. CMP segments are typically longer segments of roadway averaging approximately 1.2 mile in length (range: 0.2 to 5.0 miles).

Therefore, TMC links needed to be aligned against or mapped onto the CMP segments. This mapping was created as a part of the 2013 validation project and updated for the 2014 and 2016 TMCs.

It should be noted that for some CMP segments, the ends of the CMP did not align with the ends of the TMCs. Figure E-2 shows a schematic example to explain this concept. It shows one CMP segment that is made up of four TMC links. However the end of the last TMC link does not align with the end of the CMP segment. In these instances, only the overlapping portion of the TMC length was used to calculate the average speed.

Figure E-2: End points of CMP and TMC do not align

[15] TMC length statistics are based on TMCs used in this monitoring project.

E.2 | Step 2. Filter Raw Data

The raw INRIX data was filtered to remove:

- Times outside the morning and afternoon peak periods;
- Days other than Tuesdays to Thursdays;
- Data points impacted by special events i.e. spring break, incidents, construction, major sporting events; and
- Data points with lower data quality scores.

INRIX includes a data quality score that accompanies every INRIX data point. The score value is defined as:

- Score of 30: Data are exclusively generated from real-time sources.
- Score of 20: A mix of historical and real-time sources are used.
- Score of 10: Data are exclusively generated from historical data.

Only raw speeds that were directly measured were used for computing LOS in the CMP network. As such, data points with scores of 10 and 20 were removed, and only data with a score of 30 were used.

The quantity of remaining data points was tracked so the sample size of score 30 was known. The sample sizes are presented in conjunction with all associated commercial speed data results.

Note that Steps 2 and 3 were undertaken using the open source software R. This software is widely used in data analytics and statistics for managing medium size quantities of data (as was the case in this project). Datasets of this size would be difficult to manipulate in a spreadsheet program. Iteris wrote R scripts that performed these processes.

E.3 | Step 3. Spatial and Temporal Data Aggregation - Average Speed Computations

This section discusses the methodology of aggregating the data both spatially and temporally. The input to this step was 11 million data points of INRIX speed data. Table E-1 displays two such sample data points. The output from this were the average speed and sample size of each CMP segment. A sample of the output is included in Table E-2.

Table E-1: Sample INRIX Input Data

TMC Code	Time Stamp	Speed (mph)	Travel time (min)	Score
105+04359	2016-03-01 07:00:39	69	1.17	30
105N04358	2016-03-01 07:00:39	65	0.59	30

Table E-2: Sample Output from Step 3 – Average Speed on CMP Link

ID	CMP Route	Jurisdiction	Length (mi)	Sample Size	Speed (mph)
F1	I-80 – EB: SF County Line to Toll Plaza	Oak	2.01	2795	62.2
F2	I-80 – EB: Toll Plaza to I-580 SB Merge	Oak	1.3	1889	63.2

The following steps describe how the dataset was restructured to obtain the results in Table E-2. This involved spatial and temporal aggregation.

F.3.1 | Spatial Aggregation

Using the mapping created in Step 1 and the filtered INRIX data from Step 2, the TMC data was spatially aggregated on the CMP segments. In cases where multiple TMC links span a single CMP segment, the travel time was summed for all TMCs.

$$CMP\ Travel\ Time = TMC_1 + TMC_2 + \cdots + TMC_n$$

F.3.2 | Temporal Aggregation

Temporal aggregation involved the translation of the CMP travel time metric for each minute of data into one average speed value corresponding to each CMP segment for the entire monitoring period. The following formula was used for this:

$$Average\ CMP\ Speed = \frac{\sum CMP\ Length}{\sum CMP\ Travel\ time}$$

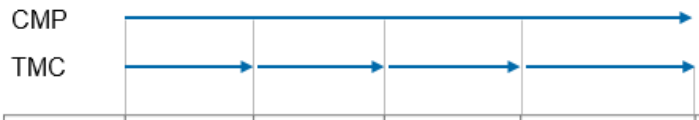
Sample size information was retained to assess the confidence level in the computed statistics.

F.3.3 | Sample Size

The sample size is the number of data points that contributed to the final calculation of average speed. The sample size varied on each TMC through removal of data points during the filtering process and through the processes discussed below.

Removal of TMC data points with scores of 20 and 10 (Step 2 above) eliminated data for particular one-minute time periods from one or more of the TMCs that comprise certain CMP segments. The example shows a longer CMP segment which is comprised of four TMCs. The table shows the data scores for each TMC for each one minute time period. In time periods 1, 2, and 7, one of the TMCs had a data score of 20 and therefore the record from that TMC was excluded for those

minutes. In time period 6, two of the TMCs had data scores of 20 and similarly, these TMC records were also excluded for time period 6 (Figure E-3).



Time period	TMC1	TMC2	TMC3	TMC4	Length
1	20	30	30	30	¾
2	20	30	30	30	¾
3	30	30	30	30	1
4	30	30	30	30	1
5	30	30	30	30	1
6	20	30	20	30	½
7	30	30	20	30	¾

Figure E-3: Example of Filtering Process

Iteris performed a check to ensure that any time periods that had too many TMCs removed were not included in the analysis. Where TMC data were available for less than 99% of the TMCs that were chosen for mapping, that one-minute time period was removed. To extend the above example further, if TMC1 was less than 1% of the CMP segment length, then it would still be possible to use the data in Time periods 1 and 2 (in addition to time periods 3, 4 and 5). This can be justified, because TMC1 does not contribute significantly to the distance-based average speed calculation.

In a small minority of cases, using the 99% threshold resulted in removal of too many time periods and an inadequate sample size. In these cases, the threshold was lowered to 70% to ensure that the sample size was adequate. A minimum sample size of 50 was used.

The remainder of this section gives information about the sample sizes observed on all CMPs. Note that there are 327 CMP segments measured with commercial speed data each having an AM and PM measurement of average speed. This totals 654 measurements.[16] Figure E-4 shows a frequency plot of the sample sizes obtained for each CMP (AM and PM recorded separately). For example, there were 78 CMP measurements that had a sample size between 1000 and 2000 data points. The data points with lower sample sizes were typically located on the arterial network (Tier 2).

[16] Segments measured using floating car surveys were excluded from this analysis of sample size.

The assumptions made by Iteris in this section have been confirmed with Alameda CTC for their reasonableness.

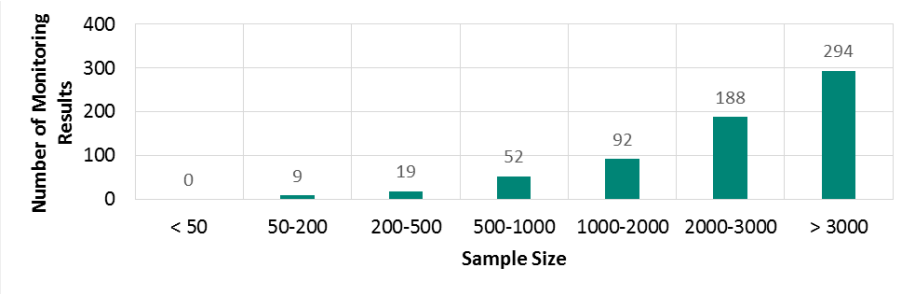


Figure E-4: Histogram of Sample Sizes for CMP Segments Monitored using Commercial Speed Data (Tuesday to Thursday time period)

Appendix F | Technical details for Field Surveys

F.1 | Approach for Arterials (Tier 1 and 2), Ramps and HOV

Floating car surveys were conducted on arterials (Tier 1), HOV lanes, a portion of arterials (Tier 2), and three ramp segments.

Floating car runs were completed using the industry accepted approach of attempting to represent the average vehicle. Drivers aimed to pass as many vehicles as passed them. Six surveys were conducted in each of the morning (7 a.m. to 9 a.m.) and afternoon (4 p.m. to 6 p.m.) peak periods. Surveys were only undertaken on Tuesdays, Wednesdays, and/or Thursdays. For a particular segment, the surveys were scheduled so they spanned a range of days and times. The aim of this is to ensure that a range of representative traffic conditions are surveyed.

As discussed in Section 2.1, floating car surveys were scheduled to avoid certain conditions that could be expected to lead to irregular traffic patterns such as school holidays, incidents and short term construction etc.

Drivers were instructed to comply with all road rules. This includes the speed limit, traffic signal displays and not stopping within intersections. In this respect, it is noted that there may be some minor differences between the results from these professional floating car surveys and normal driving behavior; however these differences are unavoidable.

Once the field data was collected for each route, it was downloaded from the survey device and processed in PC Travel[17] software. Technicians specified the check points at the beginning/end of each CMP segment and the software extracted the timestamp of when the survey vehicle passed the check point. The timestamps were transferred to spreadsheets (developed previously by Alameda CTC) and the spreadsheets calculated the travel time (in minutes), average speed (mph) and LOS according to the appropriate HCM look up table in Section 2.3.

The software also provided the associated length between check points and, as a quality check, these were compared to the reported CMP segment length. Where necessary, the PC Travel processing was refined to ensure the lengths surveyed matched the lengths reported. As a further quality check, the average speed values were reviewed for reasonableness against:

[17] PC Travel http://www.pc-travel.com/

- Data from previous monitoring efforts;
- Adjacent CMP segments; and/or
- Congestion trends in Google Maps.

F.2 | Approach for OD Surveys

OD surveys were conducted in a similar manner to other floating car surveys, except considering the following additional requirements. OD surveys consisted of a simultaneous survey of up to three modes of travel in the following quantities:

- Four floating car surveys for the auto mode;
- Four floating car surveys for the HOV mode;
- Two transit surveys, where the surveyor rode transit as a passenger;
- Two transit surveys, where the surveyor makes a synthesized transit trip using real time transit information from a desktop computer; and
- Two bike surveys using the same bike rider.

Note that the desktop transit survey is considered as a pilot study and is used in 2016 only. As a complement to the in-field surveys which were conducted at the same time, in the desktop survey the bus arrivals, travel times, and departures, as well as walking times were taken from online transit information and navigation websites. This method or other methods are up for further consideration in later study cycles.

The start times of two of the survey runs were coordinated to begin at the same time for each mode. The two additional auto/HOV surveys were undertaken separately.

Appendix G | Big Data Performance Analysis

G.1 | Reliability Analysis

The Reliability Segments which are defined for all freeways in Alameda County as described in Chapter 7 of the main report. **Error! Reference source not found.** lists the Reliability Segments by their ID (N1 to N38). This table also gives their results.

- Additionally the following collections of graphs are presented.
- **Error! Reference source not found.** gives the travel time distributions of all Reliability Segments.
- Figures **Error! Reference source not found.** and **Error! Reference source not found.** show the reliability on the entire freeway network, for the morning and afternoon peak periods respectively.

Summaries of the performance measures used in these tables are provided below:

- 95% Travel Time: 95th Percentile Travel time
- Free Flow Travel Time: Equal to the travel time at 65 mph.
- PTI – Planning Time Index: 95th percentile travel time divided by the free flow travel time
- Mean Travel Time: Mean of travel times.
- BTI – Buffer Time Index – (95th Percentile Travel Time – Mean Travel Time) / Mean Travel time

Table G-1: Reliability Segment Results

Reliability Segment ID	Description	Peak Period	New ID	Segment Length (mi)	95% Travel Time (min)	Free Flow Travel Time (min)	PTI	Mean Travel Time (min)	BTI
N1	I-80 - EB from SF County Line to Toll Plaza	AM	1	5.3	5.7	4.7	1.2	5.2	0.1
N1	I-80 - EB from SF County Line to Toll Plaza	PM	1	5.3	11.0	4.6	2.4	7.4	0.5
N10	I-580 - WB from I-680 to I-238	AM	7	10.3	15.7	9.5	1.7	10.8	0.5
N10	I-580 - WB from I-680 to I-238	PM	7	10.3	12.7	9.5	1.3	10.3	0.2
N11	I-580 - EB from I-80 to SR 13	AM	5	7.5	7.6	6.9	1.1	6.9	0.1
N11	I-580 - EB from I-80 to SR 13	PM	5	7.5	26.9	6.8	3.9	18.4	0.5
N12	I-580 - EB from SR 13 to I-238	AM	6	7.9	7.6	7.3	1.1	6.9	0.1
N12	I-580 - EB from SR 13 to I-238	PM	6	7.9	8.7	7.2	1.2	8.1	0.1
N13	I-580 - WB from I-238 to SR 13	AM	6	7.9	25.3	7.1	3.6	13.1	0.9
N13	I-580 - WB from I-238 to SR 13	PM	6	7.9	8.3	7.0	1.2	6.8	0.2
N14	I-580 - WB from SR 13 to I-80	AM	5	7.7	23.6	6.7	3.5	13.7	0.7
N14	I-580 - WB from SR 13 to I-80	PM	5	7.7	10.7	6.9	1.6	8.7	0.2

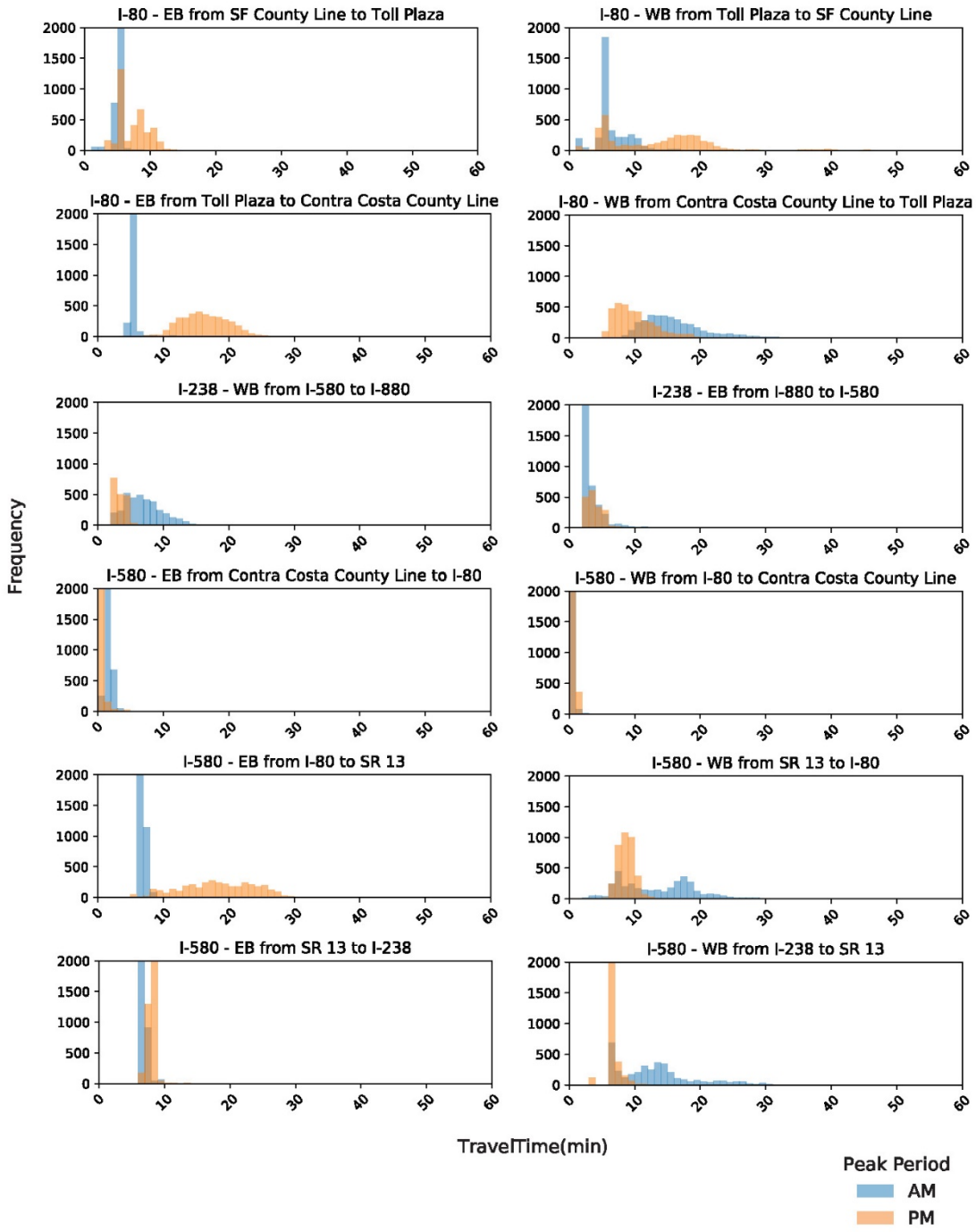
Table G-1: Reliability Segment Results

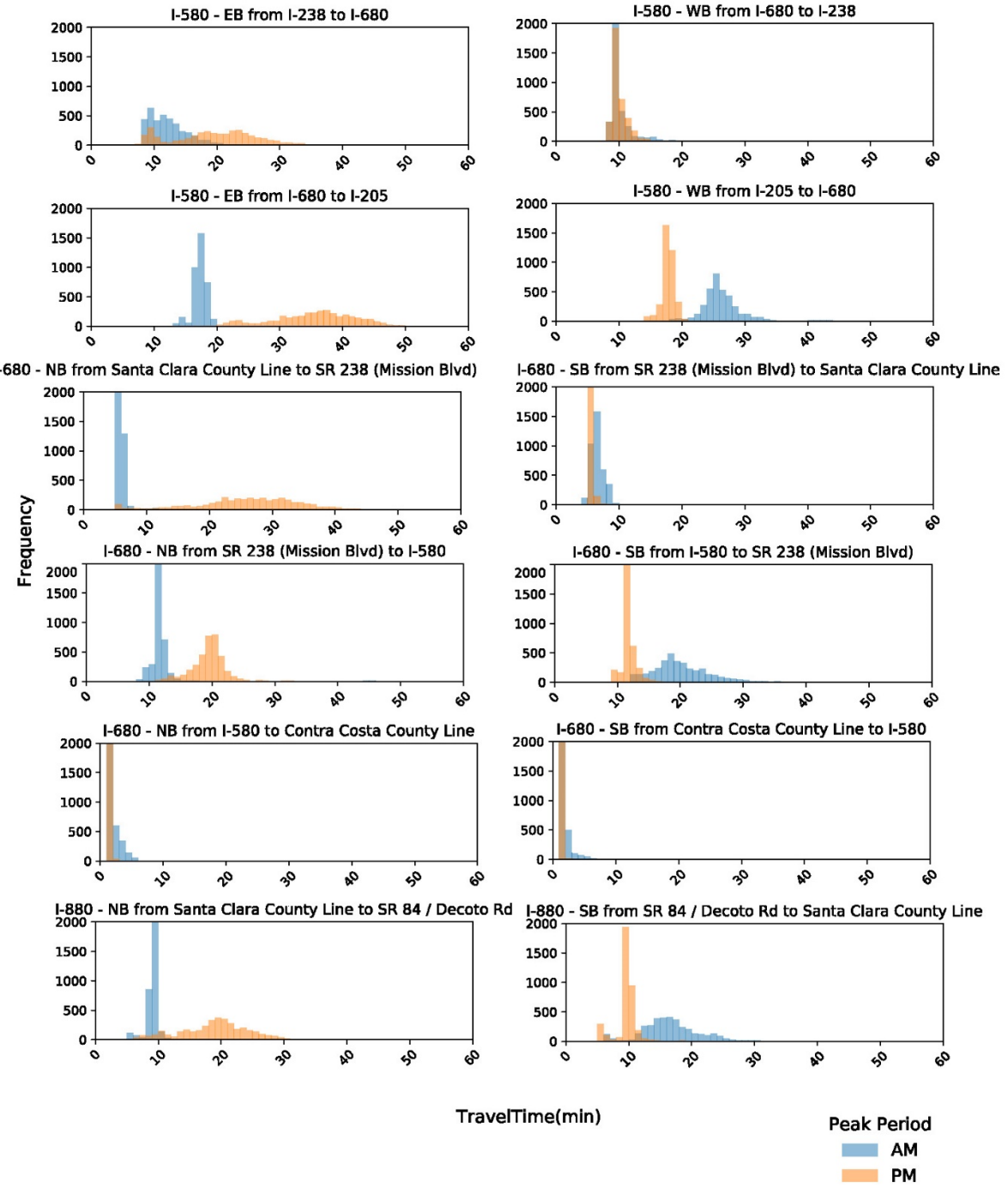
Reliability Segment ID	Description	Peak Period	New ID	Segment Length (mi)	95% Travel Time (min)	Free Flow Travel Time (min)	PTI	Mean Travel Time (min)	BTI
N15	I-580 - EB from Contra Costa County Line to I-80	AM	4	0.7	2.6	0.6	4.0	1.7	0.5
N15	I-580 - EB from Contra Costa County Line to I-80	PM	4	0.7	1.1	0.6	1.6	0.8	0.3
N16	I-580 - WB from I-80 to Contra Costa County Line	AM	4	0.9	0.9	0.8	1.2	0.9	0.1
N16	I-580 - WB from I-80 to Contra Costa County Line	PM	4	0.9	1.0	0.8	1.3	0.9	0.1
N17	I-680 - NB from Santa Clara County Line to SR 238 (M	AM	9	6.3	6.7	5.8	1.2	6.0	0.1
N17	I-680 - NB from Santa Clara County Line to SR 238 (M	PM	9	6.3	38.8	5.8	6.7	26.2	0.5
N18	I-680 - NB from SR 238 (Mission Blvd) to I-580	AM	10	13.1	14.2	11.8	1.2	12.9	0.1
N18	I-680 - NB from SR 238 (Mission Blvd) to I-580	PM	10	13.1	23.4	11.9	2.0	19.6	0.2
N19	I-680 - NB from I-580 to Contra Costa County Line	AM	11	1.9	4.1	1.7	2.4	2.2	0.9
N19	I-680 - NB from I-580 to Contra Costa County Line	PM	11	1.9	1.8	1.7	1.0	1.7	0.1
N2	I-80 - EB from Toll Plaza to Contra Costa County Line	AM	2	6.1	6.0	5.2	1.1	5.5	0.1
N2	I-80 - EB from Toll Plaza to Contra Costa County Line	PM	2	6.1	22.1	5.1	4.3	16.3	0.4
N20	I-680 - SB from Contra Costa County Line to I-580	AM	11	1.9	3.5	1.7	2.0	2.0	0.8
N20	I-680 - SB from Contra Costa County Line to I-580	PM	11	1.9	1.7	1.7	1.0	1.6	0.1
N21	I-680 - SB from I-580 to SR 238 (Mission Blvd)	AM	10	13.1	28.6	12.0	2.4	20.1	0.4
N21	I-680 - SB from I-580 to SR 238 (Mission Blvd)	PM	10	13.1	13.7	11.9	1.2	11.8	0.2
N22	I-680 - SB from SR 238 (Mission Blvd) to Santa Clara C	AM	9	6.4	8.4	5.8	1.5	6.5	0.3
N22	I-680 - SB from SR 238 (Mission Blvd) to Santa Clara C	PM	9	6.4	6.0	5.9	1.0	5.5	0.1
N23	I-880 - NB from Santa Clara County Line to SR 84 / De	AM	12	10.1	10.1	9.1	1.1	9.1	0.1
N23	I-880 - NB from Santa Clara County Line to SR 84 / De	PM	12	10.1	27.1	8.6	3.2	18.8	0.4
N24	I-880 - NB from SR 84 / Decoto Rd to SR 92	AM	13	6.4	11.8	5.5	2.2	7.1	0.7
N24	I-880 - NB from SR 84 / Decoto Rd to SR 92	PM	13	6.4	24.2	5.9	4.1	18.7	0.3
N25	I-880 - NB from SR 92 to I-80	AM	14	18.9	55.3	16.8	3.3	34.3	0.6
N25	I-880 - NB from SR 92 to I-80	PM	14	18.9	30.1	11.7	2.6	19.6	0.5
N26	I-880 - SB from I-80 to SR 92	AM	14	18.8	31.9	16.8	1.9	22.6	0.4
N26	I-880 - SB from I-80 to SR 92	PM	14	18.8	45.9	11.6	4.0	24.4	0.9
N27	I-880 - SB from SR 92 to SR 84 / Decoto Rd	AM	13	6.4	24.0	5.5	4.4	15.5	0.5
N27	I-880 - SB from SR 92 to SR 84 / Decoto Rd	PM	13	6.4	12.4	5.6	2.2	7.7	0.6
N28	I-880 - SB from SR 84 / Decoto Rd to Santa Clara County	AM	12	10.1	24.8	8.9	2.8	16.8	0.5
N28	I-880 - SB from SR 84 / Decoto Rd to Santa Clara County	PM	12	10.1	11.5	8.9	1.3	9.7	0.2
N29	I-980 - WB from I-580 to I-880	AM	15	2.5	2.3	2.1	1.1	2.1	0.1
N29	I-980 - WB from I-580 to I-880	PM	15	2.5	3.3	2.1	1.6	2.3	0.5

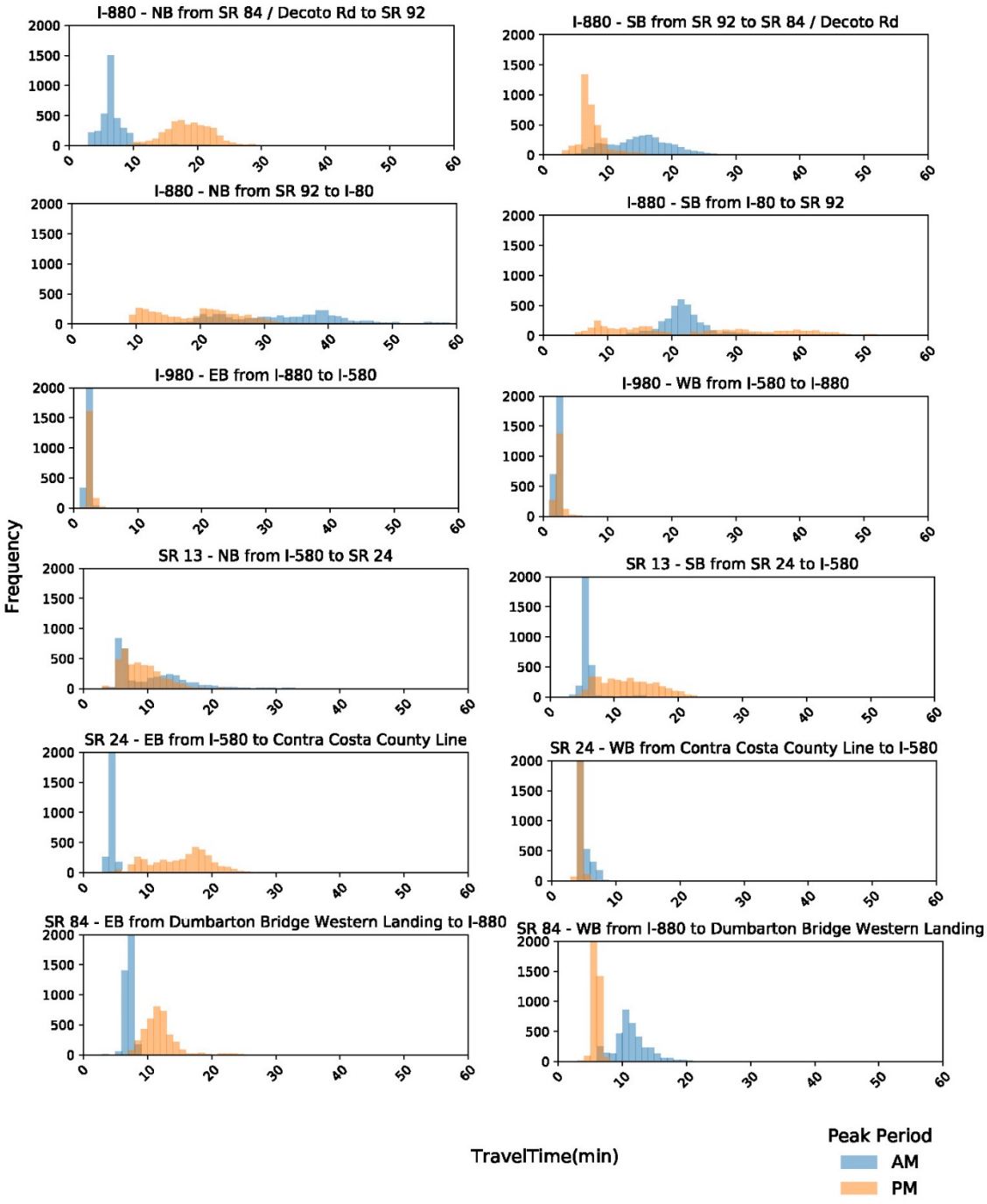
Table G-1: Reliability Segment Results

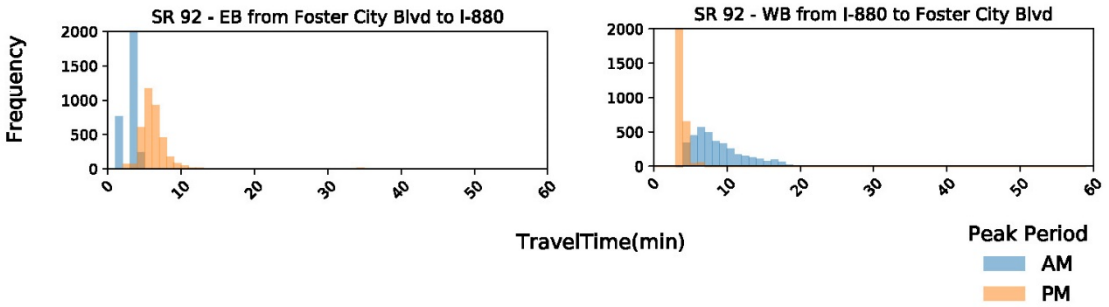
Reliability Segment ID	Description	Peak Period	New ID	Segment Length (mi)	95% Travel Time (min)	Free Flow Travel Time (min)	PTI	Mean Travel Time (min)	BTI
N3	I-80 - WB from Contra Costa County Line to Toll Plaza	AM	2	6.0	26.4	5.0	5.3	16.2	0.6
N3	I-80 - WB from Contra Costa County Line to Toll Plaza	PM	2	6.0	17.2	5.1	3.3	10.2	0.7
N30	I-980 - EB from I-880 to I-580	AM	15	2.4	2.4	2.1	1.2	2.2	0.1
N30	I-980 - EB from I-880 to I-580	PM	15	2.4	3.4	2.1	1.6	2.4	0.4
N31	SR 13 - NB from I-580 to SR 24	AM	16	5.8	23.0	5.3	4.3	11.1	1.1
N31	SR 13 - NB from I-580 to SR 24	PM	16	5.8	14.9	5.3	2.8	9.1	0.6
N32	SR 13 - SB from SR 24 to I-580	AM	16	5.9	6.6	5.4	1.2	5.8	0.1
N32	SR 13 - SB from SR 24 to I-580	PM	16	5.9	19.7	5.4	3.6	12.1	0.6
N33	SR 24 - EB from I-580 to Contra Costa County Line	AM	17	4.5	5.0	4.1	1.2	4.4	0.1
N33	SR 24 - EB from I-580 to Contra Costa County Line	PM	17	4.5	22.6	4.1	5.5	15.4	0.5
N34	SR 24 - WB from Contra Costa County Line to I-580	AM	17	4.6	7.0	4.2	1.7	5.0	0.4
N34	SR 24 - WB from Contra Costa County Line to I-580	PM	17	4.6	4.9	4.2	1.2	4.4	0.1
N35	SR 84 - EB from Dumbarton Bridge Western Landing t	AM	18	7.5	8.0	6.8	1.2	7.1	0.1
N35	SR 84 - EB from Dumbarton Bridge Western Landing t	PM	18	7.5	16.1	6.8	2.4	11.9	0.3
N36	SR 84 - WB from I-880 to Dumbarton Bridge Western L	AM	18	7.5	16.2	5.6	2.9	11.3	0.4
N36	SR 84 - WB from I-880 to Dumbarton Bridge Western L	PM	18	7.5	6.6	5.6	1.2	5.9	0.1
N37	SR 92 - EB from Foster City Blvd to I-880	AM	19	11.7	11.5	10.4	1.1	10.2	0.1
N37	SR 92 - EB from Foster City Blvd to I-880	PM	19	11.7	56.2	10.8	5.2	30.4	0.8
N38	SR 92 - WB from I-880 to Foster City Blvd	AM	19	11.7	49.8	10.7	4.6	29.3	0.7
N38	SR 92 - WB from I-880 to Foster City Blvd	PM	19	11.7	13.1	10.7	1.2	11.7	0.1
N4	I-80 - WB from Toll Plaza to SF County Line	AM	1	5.3	11.2	4.2	2.7	6.5	0.7
N4	I-80 - WB from Toll Plaza to SF County Line	PM	1	5.3	23.5	4.2	5.6	13.5	0.7
N5	I-238 - EB from I-880 to I-580	AM	3	2.6	6.9	2.4	2.9	3.6	0.9
N5	I-238 - EB from I-880 to I-580	PM	3	2.6	5.6	2.4	2.4	3.9	0.4
N6	I-238 - WB from I-580 to I-880	AM	3	2.5	13.2	2.3	5.8	7.6	0.7
N6	I-238 - WB from I-580 to I-880	PM	3	2.5	4.7	2.3	2.1	3.4	0.4
N7	I-580 - EB from I-238 to I-680	AM	7	10.4	18.0	9.1	2.0	12.2	0.5
N7	I-580 - EB from I-238 to I-680	PM	7	10.4	30.6	8.7	3.5	19.8	0.5
N8	I-580 - EB from I-680 to I-205	AM	8	20.0	18.9	18.2	1.0	17.3	0.1
N8	I-580 - EB from I-680 to I-205	PM	8	20.0	45.4	17.6	2.6	35.8	0.3
N9	I-580 - WB from I-205 to I-680	AM	8	19.9	32.6	17.9	1.8	26.5	0.2
N9	I-580 - WB from I-205 to I-680	PM	8	19.9	19.5	18.2	1.1	17.9	0.1

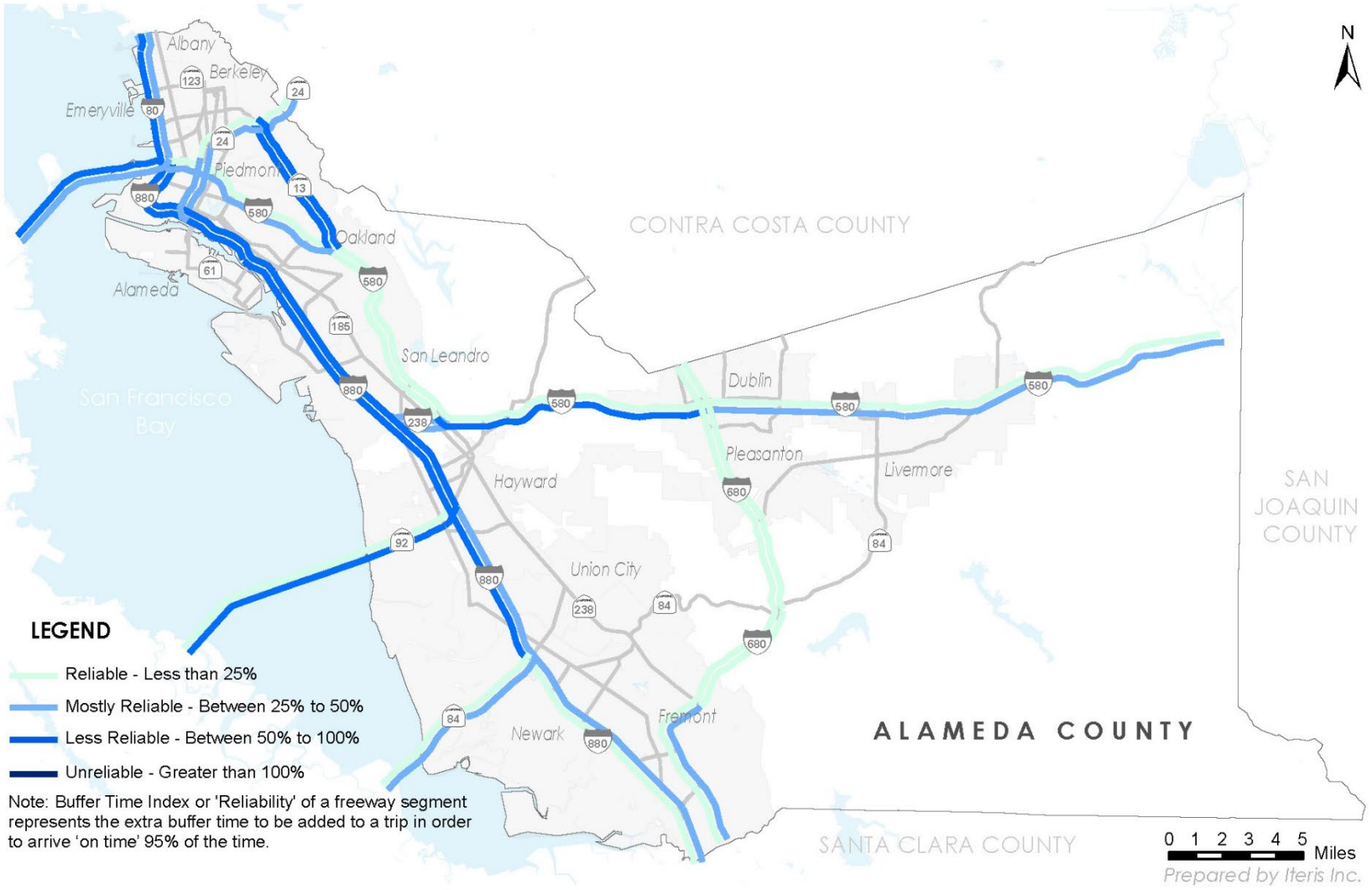
Notes
[1] Express Lane Ramp Up Period


I-80 - EB from SF County Line to Toll Plaza
I-80 - WB from Toll Plaza to SF County Line
I-80 - EB from Toll Plaza to Contra Costa County Line
I-80 - WB from Contra Costa County Line to Toll Plaza
I-238 - WB from I-580 to I-880
I-238 - EB from I-880 to I-580
I-580 - EB from Contra Costa County Line to I-80
I-580 - WB from I-80 to Contra Costa County Line
I-580 - EB from I-80 to SR 13
I-580 - WB from SR 13 to I-80
I-580 - EB from SR 13 to I-238
I-580 - WB from I-238 to SR 13
Frequency
TravelTime(min)
Peak Period
AM
PM

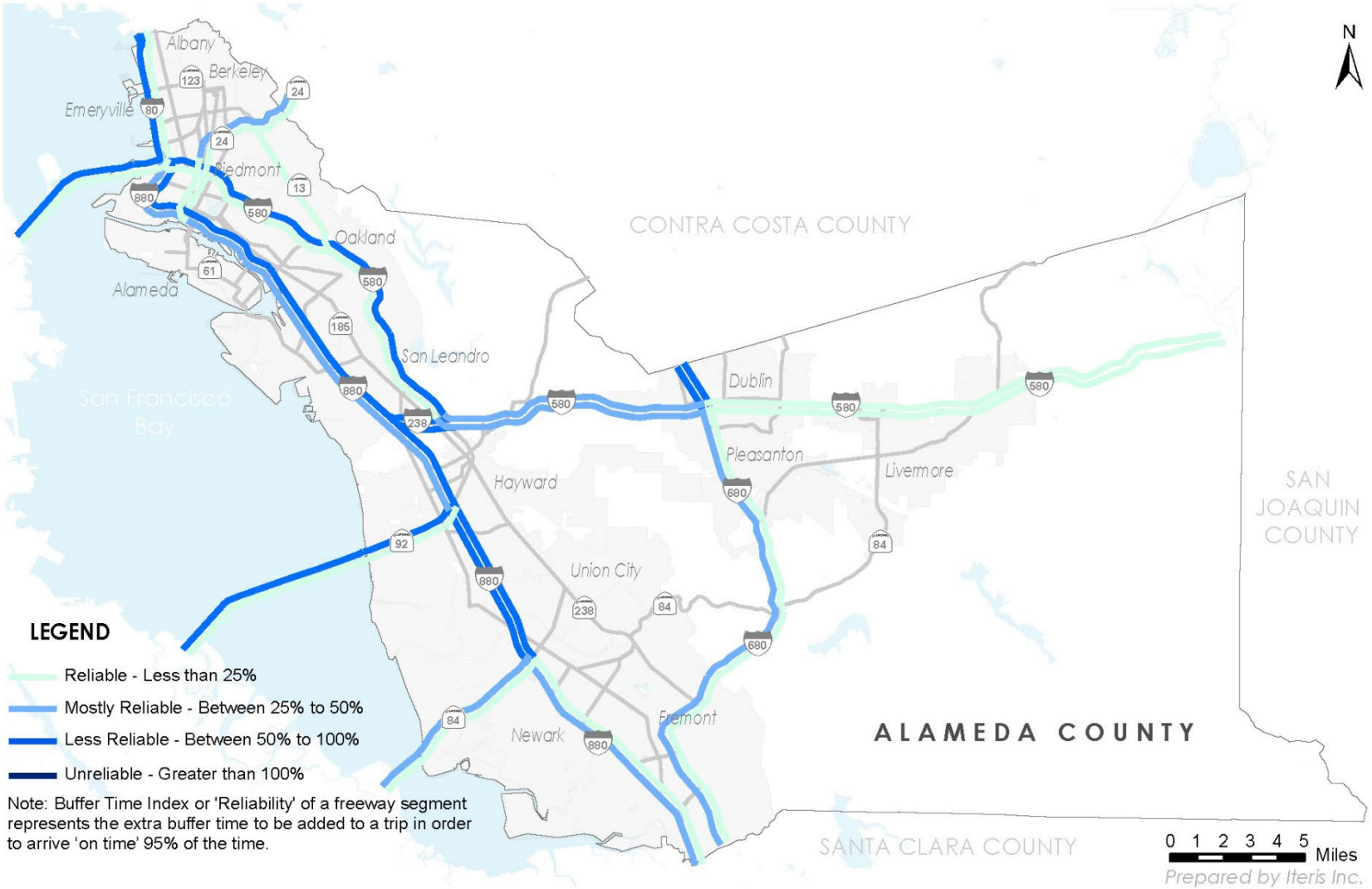

I-580 - EB from I-238 to I-680
I-580 - WB from I-680 to I-238
I-580 - EB from I-680 to I-205
I-580 - WB from I-205 to I-680
I-680 - NB from Santa Clara County Line to SR 238 (Mission Blvd)
I-680 - SB from SR 238 (Mission Blvd) to Santa Clara County Line
I-680 - NB from SR 238 (Mission Blvd) to I-580
I-680 - SB from I-580 to SR 238 (Mission Blvd)
I-680 - NB from I-580 to Contra Costa County Line
I-680 - SB from Contra Costa County Line to I-580
I-880 - NB from Santa Clara County Line to SR 84 / Decoto Rd
I-880 - SB from SR 84 / Decoto Rd to Santa Clara County Line
Frequency
TravelTime(min)
Peak Period
AM
PM


I-880 - NB from SR 84 / Decoto Rd to SR 92
I-880 - SB from SR 92 to SR 84 / Decoto Rd
I-880 - NB from SR 92 to I-80
I-880 - SB from I-80 to SR 92
I-980 - EB from I-880 to I-580
I-980 - WB from I-580 to I-880
SR 13 - NB from I-580 to SR 24
SR 13 - SB from SR 24 to I-580
SR 24 - EB from I-580 to Contra Costa County Line
SR 24 - WB from Contra Costa County Line to I-580
SR 84 - EB from Dumbarton Bridge Western Landing to I-880
SR 84 - WB from I-880 to Dumbarton Bridge Western Landing
Frequency
TravelTime(min)
Peak Period
AM
PM


SR 92 - EB from Foster City Blvd to I-880
SR 92 - WB from I-880 to Foster City Blvd
Frequency
2000
1500
1000
500
0
0
10
20
30
40
50
60
TravelTime(min)
Peak Period
AM
PM



2018 LEVEL OF SERVICE MONITORING ADDITIONAL RESULTS: RELIABILITY/BUFFER TIME INDEX - PM PEAK PERIOD



2018 LEVEL OF SERVICE MONITORING ADDITIONAL RESULTS: RELIABILITY/BUFFER TIME INDEX - AM PEAK PERIOD

G.2 | Duration of Congestion

The duration of congestion throughout the day is given for all freeway CMP segments in Table G-2, and shown on the map in Figure G-5.

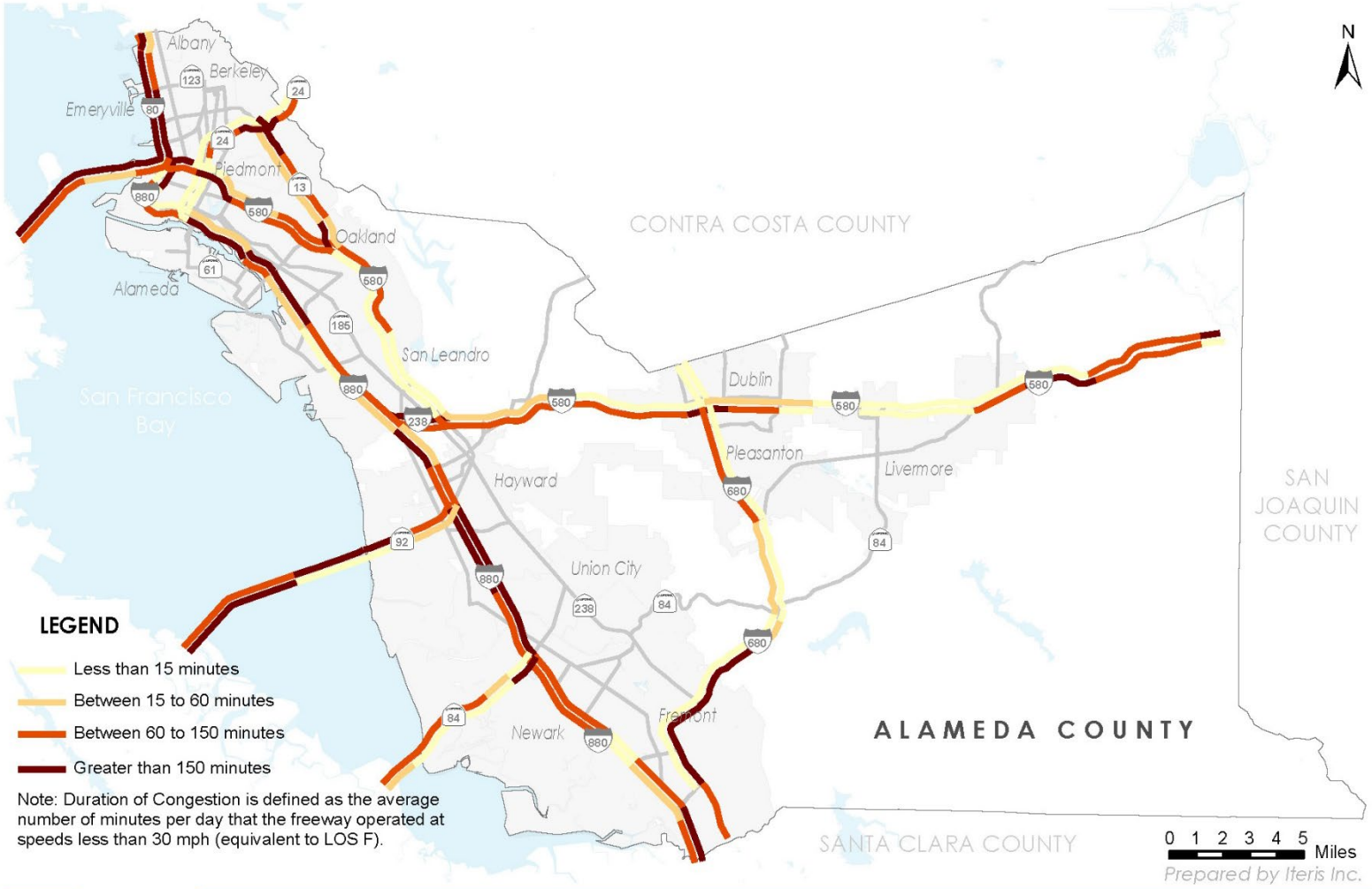
Table G-3: Duration of Congestion Analysis Results

CMP	Description	Length (mi)	Duration of Congestion (Avg. mins per day)
F1	I-80 - EB from SF County Line to Toll Plaza	2.01	25
F2	I-80 - EB from Toll Plaza tol-580 SB Merge	1.3	123
F3	I-80 - EB from I-80/I-580 (Merge) to Powell	0.54	260
F4	I-80 - EB from Powell to Ashby	0.72	292
F5	I-80 - EB from Ashby to University	1.3	205
F6	I-80 - EB from University to Jct I-580 (off)	1.37	86
F7	I-80 - EB from Jct I-580 (off) to Central (County Line)	0.84	44
F8	I-80 - WB from Central (County Line) to Jct I-580	0.7	179
F9	I-80 - WB from Jct I-580 to University	1.51	254
F10	I-80 - WB from University to Ashby	1.31	328
F12	I-80 - WB from Powell tol-80/I-580 (Split)	0.47	175
F11	I-80 - WB from Ashby to Powell	0.71	476
F13	I-80 - WB from I-580 Split to Toll Plaza	1.31	392
F14	I-80 - WB from Toll Plaza to SF County	2.01	187
F15	I-238 - EB from I-880 tol-580	2.59	71
F16	I-238 - WB from I-580 tol-880	2.48	166
F17	I-580 - EB from I-580/I-238 changed fm (I-238/Fthl Off) to Grove	2.68	61
F18	I-580 EB from Grove to Eden Canyon	2.19	66
F19	I-580 EB from Eden Canyon to San Ramon/ Foothill	4.82	132
F20	I-580 EB from San Ramon/ Foothill tol-680	0.71	208
F21	I-580 EB from I-680 to Hopyard	0.87	226
F22	I-580 EB from Hopyard to Santa Rita	1.9	141
F23	I-580 EB from Santa Rita to El Charro	1.25	7
F25	I-580 EB from SR 84/Airway Blvd. to Portola	1.73	2
F26	I-580 - EB from Portola to1st St	2.56	12
F27	I-580 - EB from 1st St to Greenville	2.13	121
F28	I-580 - EB from Greenville to N.Flynn	2.73	203
F29	I-580 - EB from N.Flynn to Grant Line	4.32	90
F30	I-580 - EB from Grant Line tol-205 (SJ Co) Off	0.87	2
F31	I-580 - WB from I-205 (SJ Co) to Grant Line	0.72	282
F32	I-580 - WB from Grant Line to N Flynn	4.59	88
F33	I-580 - WB from N Flynn to Greenville Rd	2.43	11
F34	I-580 - WB from Greenville Rd to1st St	2.21	5
F35	I-580 - WB from 1st St to Portola Ave	2.56	5
F36	I-580 - WB from Portola to SR 84/Airway Blvd	1.73	12
F37	I-580 - WB from SR 84/Airway Blvd to Fallon Rd/El Charro	1.73	14

F38	I-580 - WB from Fallon Rd/El Charro to Tassajara	1.23	16
F39	I-580 - WB from Tassajara Rd to I-680	2.78	24
F40	I-580 - WB from I-680 to San Ramon Rd	0.71	14
F41	I-580 - WB from San Ramon Rd to Eden Canyon	4.82	13
F42	I-580 - WB from Eden Canyon to Center St	2.5	17
F43	I-580 - WB from Center to I-580/238	2.26	25
F44	I-580 - EB from I-80 to I-980	1.27	124
F45	I-580 - EB from I-980 to Harrison	1.02	162
F46	I-580 - EB from Harrison to Lakeshore	0.84	161
F47	I-580 - EB from Lakeshore to Coolidge	2.21	72
F48	I-580 - EB from Coolidge to SH 13 Off	2.2	84
F49	I-580 - EB from SH 13 Off to MacArthur	4.08	1
F50	I-580 - EB from MacArthur to I-580/238	3.78	1
F51	I-580 - WB from I-238 to Foothill/MacArthur	3.86	11
F52	I-580 - WB from Foothill/MacArthur to SH 13 Off	4.04	74
F53	I-580 - WB from SH 13 Off to Fruitvale	2.63	106
F54	I-580 - WB from Fruitvale to Harrison	2.68	19
F55	I-580 - WB from Harrison to SH 24 On-ramp	1.24	10
F56	I-580 - WB from SH-24 On-ramp to I-80/580 Split	1.17	294
F57	I-580 - EB from Central (County Line) to I-80 Jct	0.7	147
F58	I-580 - WB from I-80 Jct to Central (County Line)	0.86	1
F59	I-680 - NB from Scott Creek Rd to Rt 262/Mission	2.26	114
F60	I-680 - NB from Rt 262/Mission to Durham Rd	1.62	307
F61	I-680 - NB from Durham Rd to Washington Blvd	1.3	334
F62	I-680 - NB from Washington Blvd to Rt 238/Mission	1.14	259
F63	I-680 NB from SR 238/Mission to Vargas Rd	1.1	196
F64	I-680 NB from Vargas Rd to Andrade Rd	2.21	282
F65	I-680 NB from Andrade Rd to Calaveras	1.15	49
F66	I-680 NB from Calaveras toRt.84/Vallecitos	0.39	1
F67	I-680 NB from SR 84 to Sunol Blvd	3.52	5
F68	I-680 NB from Sunol Blvd. to Bernal Ave	1.49	13
F69	I-680 NB from Bernal Ave to Stoneridge Dr	2.53	5
F70	I-680 NB from Stoneridge Dr to I-580	0.74	9
F71	I-680 - NB from I-580 to Alcosta	1.85	11
F72	I-680 - SB from Alcosta to I-580	1.85	8
F73	I-680 SB from I-580 to Stoneridge Dr	0.73	67
F74	I-680 SB from Stoneridge Dr to Bernal	2.54	127
F75	I-680 SB from Bernal Ave. to Sunol Blvd	1.49	136
F76	I-680 SB from Sunol Blvd. to SR 84	3.71	18
F77	I-680 SB from SR 84 (Niles Canyon) to Andrade Rd	1.33	6
F78	I-680 SB from Andrade Rd to Sheridan Rd	1.4	2
F79	I-680 SB from Sheridan Rd to Vargas Rd	0.81	5
F80	I-680 SB from Vargas Rd to SR 238/Mission	1.11	5

F81	I-680 - SB from Rt 238/Mission to Washington Blvd	1.14	4
F82	I-680 - SB from Washington Blvd to Durham Rd	1.35	12
F83	I-680 - SB from Durham Rd to Rt 262/Mission	1.63	1
F85	I-880 - NB from Dix Landing to SR 262/Mission	2.09	170
F86	I-880 - NB from SR 262/Mission to Auto Mall Pkwy	2.43	128
F87	I-880 - NB from Auto Mall Pkwy to Stevenson	1.53	1
F88	I-880 - NB from Stevenson to Decoto	4.06	104
F89	I-880 - NB from Decoto to Alvarado Blvd	1.17	235
F90	I-880 - NB from Alvarado Blvd to Alvarado-Niles Blvd	1.57	229
F91	I-880 - NB from Alv-Niles to Tennyson	2.6	311
F92	I-880 - NB from Tennyson to SR 92	1.02	274
F93	I-880 - NB from SR 92 to A St	1.68	110
F94	I-880 - NB from A St tol-238 (Marina before 06)	1.95	37
F95	I-880 - NB from I-880/I238 (split) to Marina Blvd	2.54	115
F96	I-880 - NB from Marina Blvd to SR 112/Davis	0.82	140
F97	I-880 - NB from SR 112/Davis to Hegenberger	1.83	109
F98	I-880 - NB from Hegenberger to High/42nd	2.34	190
F99	I-880 - NB from High/42nd to23rd (1st on)	1.25	193
F100	I-880 - NB from 23RD (1ST on) to Jct 980 (off)	2.63	16
F101	I-880 - NB from Jct 980 (off) tol-880/I-80 split	2.43	4
F102	I-880 - NB from I-880/I-80 (split) tol-880/I-80 (merge)	1.44	188
F103	I-880 - SB from I-880/I-80 split tol-880/I-80 merge	1.28	1
F104	I-880 - SB from I-880/I-80 merge to Jct 980	2.51	125
F105	I-880 - SB from I-980 to 23rd	2.74	361
F106	I-880 - SB from 23rd St to High/42nd	1.1	94
F107	I-880 - SB from High/42nd to Hegenberger	2.36	53
F108	I-880 - SB from Hegenberger to SR 112/Davis	1.82	11
F109	I-880 - SB from SR 112/Davis to Marina Blvd	0.82	14
F110	I-880 - SB from Marina Blvd to SR 238 WB (merge)	2.55	19
F111	I-880 - SB from I-238 (Marina before 06) to A St	1.91	176
F112	I-880 - SB from A St to Rt 92	1.7	113
F113	I-880 - SB from Rt 92 to Tennyson	1.01	183
F114	I-880 - SB from Tennyson to Alv-Niles	2.6	153
F115	I-880 - SB from Alvarado-Niles to Alvarado	1.56	131
F116	I-880 - SB from Alvarado to Decoto	1.19	115
F117	I-880 - SB from Decoto to Stevenson	4.06	116
F118	I-880 - SB from Stevenson to Auto Mall Pkwy	1.52	9
F119	I-880 - SB from Auto Mall Pkwy to Rt 262/Mission	2.83	30
F120	I-880 - SB from SR 262/Mission to Dix Landing(off)	1.69	91
F121	I-980 - WB from SR 24 @ 580 tol-880	2.49	5
F122	I-980 - EB from I-880 to SR 24 @ 580	2.44	6
F123	SR 13 - NB from Mountain On to Carson/Redwood (1) (off)	1.27	43
F124	SR 13 - NB from Carson/Redwood (1) (off)"to Joaquin Miller	1.08	78

F125	SR 13 - NB from Joa Miller/Linc "to Moraga Ave	1.83	115
F126	SR 13 - NB from Moraga Ave to Hiller (Sig)	1.63	186
F127	SR 13 - SB from Hiller Sig "to Moraga Ave	1.6	43
F128	SR 13 - SB from Moraga Ave "to Joa Miller/Linc	1.85	16
F129	SR 13 - SB from Joaq Miller/Lincoln "to Redwood	1.07	15
F130	SR 13 - SB from Redwood to Jct I-580 (EB Merge)	1.4	174
F131	SR 24 - EB from Jct I-580 (on) to Broadway/SR 13	1.84	136
F132	SR 24 - EB from Broadway/SR 13"toCaldecott (enter)	1.65	259
F133	SR 24 - EB from Caldecott (enter) to Fish Ranch Road	1.04	106
F134	SR 24 - WB from Fish Ranch Road (CC)"to Caldecott (exit)	0.99	3
F135	SR 24 - WB from Caldecott (exit) to Broadway	1.73	7
F136	SR 24 - WB from Broadway to Jct I-580 (on)	1.86	8
F137	SR 84 - EB from San M CL to Toll Plaza	3.29	14
F138	SR 84 - EB from Toll Plaza to Thornton	0.54	0
F139	SR 84 - EB from Thornton Ave/Pascon Padre to Newark Blvd/Ardenwood Blvd	1.16	7
F140	SR 84 - EB from Newark Blvd/Ardenwood Blvd"tol-880 NB (off)	1.2	257
F141	SR 84 - WB from I-880 NB (off) to Ardenwood/Newark	1.21	7
F142	SR 84 - WB from Ardenwood/Newark to Paseo Padre Pkwy	1.15	42
F143	SR 84 - WB from Paseo Padre Pkwy to Toll Gate	0.54	116
F144	SR 84 - WB from Toll Plaza to San M CL	3.29	120
F145	SR 92 - EB from San M CL to Toll Plaza	2.78	11
F146	SR 92 - EB from Toll Plaza to Clawiter	1.87	12
F147	SR 92 - EB from Clawiter to I-880	2.07	52
F148	SR 92 - WB from I-880"toClawiter	2.05	73
F149	SR 92 - WB from Clawiter to Toll Plaza	1.88	168
F150	SR 92 - WB from Toll Plaza to San M CL	2.79	175
F151	SR 92 - WB from San M CL to Foster City Boulevard	4.97	147
F152	SR 92 - EB from Foster City Boulevard to San M CL	4.97	219
F153	SR 84 - WB from San M CL to Ravenswood Slough	1.31	110
F154	SR 84 - EB from Ravenswood Slough to San M CL	1.31	15
F155	I-80 - WB from SF County Line to Fremont St Off Ramp	3.32	228
F156	I-80 - EB from Bryant St On Ramp to SF County Line	3.29	76



2018 LEVEL OF SERVICE MONITORING ADDITIONAL RESULTS: DURATION OF CONGESTION (BETWEEN 4:00 AM to 10:00 PM)

Appendix H | 2018 Transit Monitoring Results

H.1 | AC Transit - PM Period (AVL)

Table H-1: 2018 Transit Monitoring Results for AC Transit - PM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit-to-Auto Ratio	Sample	Speed	Peak-to-Off-peak Ratio	Sample	Speed	Method
A15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	C	0.49	0.55	194	8.3	0.98	2421	15.0	INRIX
A16	Hesperian - NB	SH 92	La Playa	Hay	C	0.78	0.64	182	9.4	0.75	2461	14.8	INRIX
A17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	C	0.43	0.72	189	10.4	1.02	3532	14.4	INRIX
A18	Hesperian - NB	W.Winton Ave	A St	Hay	C	0.97	0.45	202	9.4	0.92	3619	20.6	INRIX
A19	Hesperian - NB	A St	Hacienda	Uninc	C	0.67	0.76	210	13.9	0.92	3038	18.4	INRIX
A20	Hesperian - NB	Hacienda	Grant	Uninc	C	0.66	0.71	133	13.9	0.96	3490	19.7	INRIX
A21	Hesperian - NB	Grant	Llewelling	Uninc	C	0.27	0.70	169	7.8	0.82	3120	11.2	INRIX
A27	Hesperian - SB	Springlake	Llewelling	Uninc	C	0.39	0.92	162	11.4	0.87	2903	12.4	INRIX
A28	Hesperian - SB	Llewelling	Grant	Uninc	C	0.27	1.02	157	12.8	0.91	3118	12.6	INRIX
A29	Hesperian - SB	Grant	Hacienda	Uninc	C	0.66	0.71	103	14.8	0.99	3363	21.0	INRIX
A30	Hesperian - SB	Hacienda	A St	Uninc	C	0.67	0.57	180	10.2	0.95	3028	18.0	INRIX
A31	Hesperian - SB	A St	W.Winton Ave.	Hay	C	0.97	0.69	180	15.1	1.03	2055	21.8	INRIX
A32	Hesperian - SB	W. Winton Ave	La Playa	Hay	C	0.43	0.56	187	11.1	0.98	2932	19.9	INRIX
A33	Hesperian - SB	La Playa	SH 92	Hay	C	0.78	0.53	184	10.3	0.98	1853	19.4	INRIX
A34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	C	0.49	0.91	163	15.4	0.98	1331	16.8	INRIX
A39	Park/23rd - EB	Encinal	Santa Clara	Ala	N	0.23	0.86	378	7.7	1.18	2974	9.0	INRIX
A40	Park/23rd - EB	Santa Clara	Kennedy	Ala	N	0.68	0.86	381	9.2	0.85	2676	10.7	INRIX
A43	Park/23rd - WB	Kennedy	Santa Clara	Ala	N	0.74	1.17	310	13.7	0.99	244	11.7	INRIX
A44	Park/23rd - WB	Santa Clara	Encinal	Ala	N	0.23	0.95	267	8.6	0.98	2629	9.1	INRIX
A45	MLK Jr Way - NB	SH 24	Adeline	Oak	N	1.48	0.41	208	6.1	0.95	6	14.9	Floating Car
A46	Adeline - NB	MLK Jr -South	MLK Jr -North	Berk	N	0.28	0.60	110	7.4	0.81	2530	12.4	INRIX
A48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	N	0.31	0.52	333	7.2	0.94	2739	13.9	INRIX
A49	Shattuck NB	Dwight	University	Berk	N	0.57	0.50	305	6.0	0.92	2991	12.1	INRIX
A50	Shattuck SB	University	Dwight	Berk	N	0.57	0.46	299	5.3	1.02	3081	11.6	INRIX
A51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	N	0.3	0.40	425	6.5	0.98	3508	16.2	INRIX
A53	Adeline - SB	MLK Jr -North	MLK Jr -South	Berk	N	0.29	0.64	230	8.1	0.85	2832	12.7	INRIX
A54	MLK Jr Way - SB	Adeline	SH 24	Oak	N	1.39	0.39	271	6.6	0.92	6	16.8	Floating Car
A61	University - EB	San Pablo	Sacramento	Berk	N	0.56	0.71	118	12.1	0.98	2781	17.0	INRIX
A62	University - EB	Sacramento	ML King	Berk	N	0.49	0.52	268	9.4	0.94	3172	18.1	INRIX
A63	University - EB	ML King	Shattuck Pl	Berk	N	0.29	0.64	281	8.3	1.10	2217	12.9	INRIX
A64	University - WB	Shattuck Pl	ML King	Berk	N	0.29	0.91	306	10.4	0.90	1830	11.5	INRIX
A65	University - WB	ML King	Sacramento	Berk	N	0.49	0.53	281	9.9	0.76	3369	18.6	INRIX
A83	SR 61 - SB	Atlantic	Cent/Webster	Ala	N	0.57	0.88	83	11.5	0.94	2345	13.1	INRIX
A87	SR 61(Doolittle) - SB	High	Island Dr	Ala	N	0.44	0.68	94	15.0	0.83	2835	22.2	INRIX
A98	SR 61 - NB	Cent/Web	Atlantic	Ala	N	0.57	0.72	102	10.1	1.00	1405	14.0	INRIX
A101	Decoto - WB	SH238/Mission	Union Square	Uni Cty	S	0.86	0.64	156	12.7	0.79	3277	19.9	INRIX

Table H-1: 2018 Transit Monitoring Results for AC Transit - PM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit-to-Auto Ratio	Sample	Speed	Peak-to-Off-peak Ratio	Sample	Speed	Method
A102	Decoto - WB	Union Square	Alv-Niles Rd	Uni Cty	S	0.24	0.57	312	10.7	0.86	2587	19.0	INRIX
A103	Decoto - WB	Alv-Niles Rd	Fremont CL	Uni Cty	S	0.65	0.48	201	11.3	0.89	2607	23.4	INRIX
A106	Decoto - EB	Union City CL	Alv-Niles Rd	Uni Cty	S	0.66	0.81	206	16.1	1.02	3088	19.9	INRIX
A107	Decoto - EB	Alv-Niles Rd	Union Square	Uni Cty	S	0.24	0.63	228	13.0	1.00	3605	20.7	INRIX
A108	Decoto - EB	Union Square	SH238/Mission	Uni Cty	S	0.85	0.44	168	9.0	0.87	928	20.6	INRIX
A111	SR 84/ Fremont(Fre)-WB	Peralta	Thornton	Fre	S	0.33	0.97	165	14.4	0.91	3238	14.8	INRIX
A114	SR84/Fremont (Fre)-EB	Thornton	Peralta	Fre	S	0.32	0.71	333	12.5	0.84	2568	17.7	INRIX
A163	SR 123 SanPablo - SB	Carlson	Washington	Alb	N	0.51	0.66	201	10.7	0.81	3369	16.2	INRIX
A164	SR 123 SanPablo - SB	Washington	Marin	Alb	N	0.36	0.65	309	9.9	0.80	3156	15.1	INRIX
A165	SR 123 San Pablo - SB	Marin	Gilman	Alb - Berk	N	0.45	0.89	379	13.0	0.98	3372	14.7	INRIX
A166	SR 123 San Pablo - SB	Gilman	University	Berk	N	0.81	0.67	390	12.2	1.13	2770	18.3	INRIX
A167	SR 123 San Pablo - SB	University	Allston	Berk	N	0.19	0.74	267	12.8	1.04	3288	17.4	INRIX
A168	SR 123 San Pablo - SB	Allston	Dwight	Berk	N	0.38	0.64	403	11.2	0.99	3288	17.4	INRIX
A169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	N	0.64	0.67	425	11.5	0.99	2981	17.1	INRIX
A170	SR 123 San Pablo - SB	Ashby	Stanford	Oak	N	0.8	0.60	458	11.3	0.98	3388	18.7	INRIX
A171	SR 123 San Pablo - SB	Stanford	53rd	Oak	N	0.27	0.77	439	11.5	1.01	3555	15.0	INRIX
A172	SR 123 San Pablo - SB	53rd	Park	Emery	N	0.34	0.73	411	10.9	1.02	3555	15.0	INRIX
A173	SR 123 San Pablo - SB	Park	35th	Emery - Oak	N	0.44	0.79	340	12.1	1.09	2205	15.4	INRIX
A174	SR 123 San Pablo - SB	35th	Park	Oak - Emery	N	0.42	0.76	418	10.2	1.04	1824	13.3	INRIX
A175	SR 123 San Pablo - SB	Park	53rd	Emery	N	0.34	0.80	279	12.2	1.06	3580	15.3	INRIX
A176	SR 123 San Pablo - SB	53rd	Stanford	Oak	N	0.27	0.49	396	7.6	0.68	3580	15.3	INRIX
A177	SR 123 San Pablo - SB	Stanford	Ashby	Oak	N	0.8	0.71	398	8.7	0.77	3520	12.3	INRIX
A178	SR 123 San Pablo - SB	Ashby	Dwight	Berk	N	0.64	0.65	401	11.4	0.89	3063	17.5	INRIX
A179	SR 123 San Pablo - SB	Dwight	Allston	Berk	N	0.38	0.81	425	10.2	0.82	3351	12.5	INRIX
A180	SR 123 SanPablo - NB	Allston	University	Berk	N	0.19	0.78	388	9.7	0.78	3351	12.5	INRIX
A181	SR 123 SanPablo - NB	University	Gilman	Berk	N	0.81	0.70	375	10.2	0.78	3157	14.7	INRIX
A182	SR 123 SanPablo - NB	Gilman	Marin	Alb - Berk	N	0.45	0.61	350	8.5	0.78	3542	13.9	INRIX
A183	SR 123 SanPablo - NB	Marin	Washington	Alb	N	0.36	0.68	230	9.7	0.80	3356	14.3	INRIX
A192	SR 185 (14th) - SB	San L Blvd	Hesperian	San L	C	0.94	0.73	203	13.0	0.91	3033	17.9	INRIX
A193	SR 185 (14th) - SB	Hesperian	Bayfair	San L	C	0.47	0.70	202	11.6	0.96	1905	16.6	INRIX
A194	SR 185 (14th) - SB	Bayfair	170th	Uninc	S	1.19	0.64	192	11.8	0.92	1417	18.6	INRIX
A195	SR 185 (14th) - SB	170th	Llewelling	Uninc	S	0.2	0.78	208	15.1	0.93	2120	19.3	INRIX
A198	SR 185Hayward - NB	A St (SR 92/238 until 2012)	Sunset	Hay	C	0.43	0.76	199	15.0	0.96	2018	19.9	INRIX
A199	SR 185 (14th) - NB	Sunset	Llewelling	Uninc	S	1.05	0.80	204	16.9	1.00	411	21.2	INRIX
A200	SR 185 (14th) - NB	Llewelling	170th	Uninc	S	0.2	0.53	177	11.7	0.93	1535	22.0	INRIX
A201	SR 185 (14th) - NB	170th	Bayfair	Uninc	S	1.19	0.64	187	10.7	0.97	930	16.6	INRIX
A202	SR 185 (14th) - NB	Bayfair	Hesperian	San L	C	0.47	0.97	308	14.2	0.97	1349	14.7	INRIX
A203	SR 185 (14th) - NB	Hesperian	San L Blvd	San L	C	0.94	0.52	99	10.4	0.95	2337	20.1	INRIX
A220	SR 238 (Mission) - NB	Tamarack	Industrial	Uni Cty - Ha	S	1.96	0.55	151	11.9	0.83	3706	21.7	INRIX
A221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	C	1.46	0.61	102	12.7	0.85	3706	20.7	INRIX

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		From	To				Transit-to-Auto Ratio	Sample	Speed	Peak-to-Off-peak Ratio	Sample	Speed	Method
A223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	C	1.83	0.69	98	15.7	0.90	3394	22.8	INRIX
A224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	C	1.46	0.59	125	14.1	0.87	3588	24.0	INRIX
A225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay - Uni Ct	C	1.96	0.56	129	14.7	0.95	3611	26.2	INRIX
A229	SR 260(Tubes) - NB	Atlantic	7th/Web	Oak	N	1.35	0.52	364	13.7	1.07	2846	26.4	INRIX
A230	SR 260(Tubes) - SB	7th/Web	Atlantic	Oak	N	1.43	0.40	92	10.3	1.02	1201	25.9	INRIX
T1	W. Grand Ave - Grand Ave - EB	I-80/Maritime St	San Pablo Ave	Oak	N	1.63	0.41	611	8.1	0.65	776	19.7	INRIX
T3	W. Grand Ave - Grand Ave - EB	Broadway	I-580	Oak	N	1.08	0.60	265	7.3	0.74	1647	12.1	INRIX
T4	W. Grand Ave - Grand Ave - WB	I-580	Broadway	Oak	N	1.08	0.70	94	10.3	0.92	814	14.8	INRIX
T6	W. Grand Ave - Grand Ave - WB	San Pablo Ave	I-80/Maritime St	Oak	N	1.63	0.34	108	9.1	0.92	2394	26.8	INRIX
T7	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	I-980 ON Ramp/Brush St	Webster	Oak	N	0.6	-	299	6.1	1.08	-	-	Commercial Data Not Available
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	Webster	East side of Lake Merritt Channel	Oak	N	0.66	-	338	7.8	0.97	-	-	Commercial Data Not Available
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	N	1.15	0.85	404	11.0	0.89	1255	13.0	INRIX
T10	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	MacArthur Blvd/I-580 ON Ramp	East side of Lake Merritt Channel	Oak	N	1.15	0.52	245	7.8	0.94	758	15.0	INRIX
T11	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	East side of Lake Merritt Channel	Webster	Oak	N	0.64	-	627	7.7	1.09	-	-	Commercial Data Not Available
T12	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oak	N	0.6	-	844	7.6	1.13	-	-	Commercial Data Not Available
T17	Broadway- SB	Broadway/ College Ave	Grand Ave	Oak	N	1.91	0.73	114	8.7	1.02	1547	11.9	INRIX
T18	Broadway- SB	Grand Ave	14th St	Oak	N	0.55	0.67	1190	6.7	0.99	1654	10.1	INRIX
T19	Broadway- SB	14th St	5th St/Broadway	Oak	N	0.48	0.99	842	7.2	1.00	2496	7.3	INRIX
T22	Broadway- NB	5th St/Broadway	14th St	Oak	N	0.48	0.78	1305	6.6	1.07	631	8.5	INRIX
T23	Broadway- NB	14th St	Grand Ave	Oak	N	0.55	0.65	562	7.3	1.13	1411	11.1	INRIX
T24	Broadway- NB	Grand Ave	Broadway/ College Ave	Oak	N	1.91	0.67	99	8.4	1.01	2357	12.6	INRIX
T25	Durant-EB	Shattuck	College Ave.	Berk	N	0.73	-	262	8.1	0.93	-	-	Commercial Data Not Available
T26	College Ave-SB	Bancroft Way/ College Ave	Ashby Ave	Berk	N	0.85	0.79	124	7.2	0.80	1704	9.1	INRIX
T28	College Ave-SB	Miles Ave/SR 24	Broadway/ College	Oak	N	0.61	0.80	110	10.0	0.98	2378	12.5	INRIX

Table H-1: 2018 Transit Monitoring Results for AC Transit - PM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit-to-Auto Ratio	Sample	Speed	Peak-to-Off-peak Ratio	Sample	Speed	Method
		OFF Ramp	Ave										
T31	College Ave-NB	Ashby Ave	Bancroft Way/ College Ave	Berk	N	0.85	0.83	222	9.3	0.98	1658	11.2	INRIX
T32	Bancroft-WB	College Ave.	Shattuck	Berk	N	0.73	0.60	259	6.5	0.94	482	10.8	INRIX
T35	Shattuck Ave-NB	51st	Alcatraz Ave.	Oak - Berk	N	0.81	0.62	88	10.2	0.86	3062	16.4	INRIX
T36	Shattuck Ave-NB	Alcatraz Ave.	Adeline St.	Berk	N	0.7	0.41	225	5.6	0.94	2479	13.6	INRIX
T37	Shattuck Ave-SB	Adeline St.	Alcatraz Ave.	Berk	N	0.7	0.66	249	6.9	0.93	2454	10.5	INRIX
T43	40thSt- Shellmound Ave-EB	Shellmound Way (north of Powell St)	40th St	Emery	N	0.73	-	156	14.7	0.83	-	-	Commercial Data Not Available
T44	40thSt- Shellmound Ave-EB	40th St	San Pablo Ave	Emery	N	0.68	0.88	135	10.2	0.73	1142	11.6	INRIX
T45	40thSt- Shellmound Ave-WB	San Pablo Ave	40th St	Emery	N	0.68	0.61	74	10.2	0.91	658	16.6	INRIX
T46	40thSt- Shellmound Ave-WB	40th St	Shellmound Way (north of Powell St)	Emery	N	0.73	-	77	10.0	0.88	-	-	Commercial Data Not Available
T49	International Blvd- NB	14th Ave	Lake Merritt Blvd	Oak	N	0.88	0.80	169	14.5	1.09	364	18.1	INRIX
T50	International Blvd- SB	Lake Merritt Blvd	14th Ave	Oak	N	0.88	0.69	273	12.8	0.91	780	18.5	INRIX
T54	Foothill Blvd- NB	73rd Ave/Foothill	Seminary Ave	Oak	N	1.02	0.78	74	13.5	1.06	153	17.4	INRIX
T55	Foothill Blvd- NB	Seminary Ave	High St	Oak	N	1.22	0.62	292	11.3	0.90	370	18.2	INRIX
T56	Foothill Blvd- NB	High St	Fruitvale Ave	Oak	N	0.9	1.20	250	12.0	1.02	152	10.0	INRIX
T57	Foothill Blvd- NB	Fruitvale Ave	14th Ave	Oak	N	1.32	0.73	267	13.5	1.11	369	18.5	INRIX
T58	Foothill Blvd- NB	14th Ave	1st Ave/Lake Shore	Oak	N	0.88	0.82	231	14.5	1.12	54	17.8	INRIX
T60	Foothill Blvd- SB	14th Ave	Fruitvale Ave	Oak	N	1.32	0.73	267	11.5	0.88	284	15.8	INRIX
T61	Foothill Blvd- SB	Fruitvale Ave	High St	Oak	N	0.9	0.94	272	9.0	0.81	247	9.6	INRIX
T62	Foothill Blvd- SB	High St	Seminary Ave	Oak	N	1.22	0.70	266	12.2	0.96	575	17.5	INRIX
T63	Foothill Blvd- SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	N	1.02	1.13	122	14.6	1.15	276	12.9	INRIX
T65	E. 15th St- SB/14th Ave	1st Ave	Foothill Blvd/14th Ave	Oak	N	0.98	-	284	11.8	0.98	-	-	Commercial Data Not Available
T98	Hesperian Blvd- Union City Blvd-NB	Union City/ Alvarado Blvd	Whipple Rd	Uni Cty	S	0.98	0.75	204	9.2	0.51	3590	12.3	INRIX
T99	Hesperian Blvd- Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	S	0.3	0.82	197	9.8	0.62	3706	11.9	INRIX
T100	Hesperian Blvd- Union City Blvd-NB	Hesperian/Union City/overbridge	Industrial Blvd	Hay	S	0.57	0.89	212	12.7	0.96	3702	14.3	INRIX
T101	Hesperian Blvd- Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Hay	S	1.05	0.57	198	13.6	0.88	3526	23.8	INRIX
T102	Hesperian Blvd- Union City Blvd-SB	Tennyson/ Hesperian	Industrial Blvd	Hay	S	1.05	0.56	190	12.9	0.88	2744	23.0	INRIX
T103	Hesperian Blvd- Union City Blvd-SB	Industrial Blvd	Hesperian/Union CityBlvd/overbridge	Hay	S	0.57	0.77	185	16.3	1.00	757	21.2	INRIX

Table H-1: 2018 Transit Monitoring Results for AC Transit - PM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit-to-Auto Ratio	Sample	Speed	Peak-to-Off-peak Ratio	Sample	Speed	Method
T104	Hesperian Blvd- Union City Blvd-SB	Hesperian/Union City/overbridge	Whipple Rd	Uni Cty	S	0.3	0.69	169	16.4	0.91	3546	23.8	INRIX
T105	Hesperian- Union City Blvd-SB	Whipple Rd	Union City/Alvarado	Uni Cty	S	0.98	0.41	194	9.9	0.88	2565	24.2	INRIX
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado	Uni Cty	S	0.51	0.58	222	11.6	0.67	2536	19.9	INRIX
T109	Alvarado Blvd.-SB	Union City/ Alvarado Blvd	Fair Ranch Rd	Uni Cty	S	0.51	0.72	207	12.4	0.92	2103	17.3	INRIX
T117	Fremont Blvd- NB	Mowry Ave	Peralta Blvd	Fre	S	1.21	0.49	201	11.4	0.93	2911	23.2	INRIX
T118	Fremont Blvd- NB	Peralta Blvd	Thornton Ave	Fre	S	0.33	0.70	229	10.4	0.90	2731	15.0	INRIX
T119	Fremont Blvd- NB	Thornton Ave	Decoto Rd	Fre	S	1.33	0.53	144	13.8	0.86	3075	25.8	INRIX
T124	Fremont Blvd- SB	Decoto Rd	Thornton Ave	Fre	S	1.33	0.61	189	15.2	1.02	2060	24.7	INRIX
T125	Fremont Blvd- SB	Thornton Ave	Peralta Blvd	Fre	S	0.32	0.72	342	12.4	0.80	3003	17.1	INRIX
T126	Fremont Blvd- SB	Peralta Blvd	Mowry Ave	Fre	S	1.21	0.29	53	6.6	0.94	2002	22.8	INRIX
T196	20th St from San Pablo Ave to Harrison St	San Pablo Ave	Harrison St	Oak	N	0.51	0.32	1090	6.9	0.96	3830	21.3	INRIX
T200	40th St- Shellmound Ave - WB	Broadway	Powell Blvd	Emery	N	1.31	0.55	53	8.9	0.87	283	16.2	INRIX
T203	55th St from Market St to Shattuck Ave	Market St	Shattuck Ave	Oak	N	0.52	-	448	7.0	0.86	-	-	Commercial Data Not Available
T208	8th St from Harrison St to Broadway	Harrison	Broadway	Oak	N	0.22	1.44	334	10.4	1.09	1643	7.2	INRIX
T214	Alvarado- Niles/Smith/ Niles Blvd - EB	Union City Blvd	Mission Blvd	Fre	S	6.89	0.54	422	12.4	0.87	1917	22.9	INRIX
T232	Durant Ave from Shattuck Ave to College Ave	Shattuck Ave	College Ave	Berk	N	0.73	-	287	8.4	0.87	-	-	Commercial Data Not Available
T233	Dyer St - SB	Whipple Road	Alvarado Blvd	Uni City	S	1.15	0.59	335	12.6	0.90	1974	21.3	INRIX
T244	Fruitvale Ave - NB	Tilden Way	MacArthur Blvd	Ala	N	2.37	0.48	675	6.7	0.91	277	14.0	INRIX
T247	Harrison St- Oakland Ave - EB	20th St	MacArthur Blvd	Oak	N	0.99	0.47	380	8.0	0.77	3036	17.2	INRIX
T248	High St - NB	I-580	MacArthur Blvd	Oak	N	0.05	1.91	341	13.5	0.92	1483	7.1	INRIX
T255	MacArthur- Santa Clara - WB	Estudillo Ave	Seminary Ave	San L - Oak	C	4.36	0.61	394	12.2	0.96	51	20.0	INRIX
T258	Market St - NB	55th St	Stanford Ave	Oak	N	0.36	0.59	109	8.2	0.71	2442	14.0	INRIX
T260	Martin Luther King Jr Way - NB	San Pablo Ave	47th St	Oak	N	1.78	0.39	377	6.5	1.01	507	16.5	INRIX
T266	Otis Dr from Park St to Broadway	Park St	Broadway	Ala	N	0.24	-	120	14.0	0.85	-	-	Commercial Data Not Available
T269	Park St - NB	Otis Dr	Encinal Ave	Ala	N	0.42	0.82	227	12.4	0.92	1982	15.1	INRIX
T277	Santa Clara Ave from Webster St to Broadway	Webster St	Broadway	Ala	N	2.28	-	307	14.0	1.03	-	-	Commercial Data Not Available
T279	Shattuck Ave from University Ave to Marin Ave	University Ave	Marin Ave	Oak	N	1.27	-	802	6.0	1.00	-	-	Commercial Data Not Available

Table H-1: 2018 Transit Monitoring Results for AC Transit - PM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit-to-Auto Ratio	Sample	Speed	Peak-to-Off-peak Ratio	Sample	Speed	Method
T280	Solano Ave from San Pablo Blvd to Sutter St	San Pablo Blvd	Sutter St	Oak	N	1.47	-	129	6.6	0.80	-	-	Commercial Data Not Available
T302	20th St from San Pablo Ave to Harrison St	San Pablo Ave	Harrison St	Oak	N	0.51	-	996	6.9	0.98	-	-	Commercial Data Not Available
T306	40th St- Shellmound Ave - EB	Powell Blvd	Broadway	Emery	N	1.31	0.49	72	8.3	0.94	1020	17.1	INRIX
T309	55th St from Market St to Shattuck Ave	Market St	Shattuck Ave	Oak	N	0.52	-	365	7.6	0.87	-	-	Commercial Data Not Available
T335	Durant Ave from Shattuck Ave to College Ave	Shattuck Ave	College Ave	Berk	N	0.73	-	300	8.6	0.93	-	-	Commercial Data Not Available
T336	Dyer St - NB	Whipple Road	Alvarado Blvd	Uni City	S	1.15	0.76	419	11.4	0.92	3002	15.0	INRIX
T347	Fruitvale Ave - SB	MacArthur Blvd	Tilden Way	Ala	N	2.37	0.73	872	8.6	0.97	152	11.7	INRIX
T350	Harrison St- Oakland Ave - SB	MacArthur Blvd	20th St	Oak	N	0.99	0.50	361	8.2	0.74	423	16.3	INRIX
T351	High St - WB	MacArthur Blvd	I-580	Oak	N	0.05	1.01	168	12.9	0.88	1245	12.8	INRIX
T361	Market St - SB	Stanford Ave	55th St	Oak	N	0.36	0.64	90	8.9	0.81	1819	13.9	INRIX
T363	Martin Luther King Jr Way - SB	47th St	San Pablo Ave	Oak	N	1.78	0.31	315	5.8	1.06	92	18.5	INRIX
T369	Otis Dr from Park St to Broadway	Park St	Broadway	Ala	N	0.24	-	94	14.8	0.90	-	-	Commercial Data Not Available
T372	Park St - SB	Encinal Ave	Otis Dr	Ala	N	0.42	0.92	182	12.8	0.97	2028	14.0	INRIX
T380	Santa Clara Ave from Webster St to Broadway	Webster St	Broadway	Ala	N	2.28	-	377	13.0	1.00	-	-	Commercial Data Not Available
T382	Shattuck Ave from University Ave to Marin Ave	University Ave	Marin Ave	Berk	N	1.18	-	917	6.1	0.98	-	-	Commercial Data Not Available
T409	Santa Clara- NB	I-580	Oakland Ave	Oak	N	0.82	0.62	348	11.7	0.92	515	18.9	INRIX
T410	MacArthur- Sant aClara- WB	Seminary Ave	Grand Ave	Oak	N	4.79	-	355	12.5	0.94	-	-	Commercial Data Not Available
T411	MacArthur- Santa Clara from Grand Ave to Piedmont Ave	Grand Ave	Piedmont Ave	Oak	N	0.45	-	195	13.0	0.98	-	-	Commercial Data Not Available
T413	MacArthur- Santa Clara from Piedmont Ave to Grand Ave	Piedmont Ave	Grand Ave	Oak	N	0.45	-	349	12.6	0.93	-	-	Commercial Data Not Available
T414	MacArthur- Santa Clara- EB	Grand Ave	Seminary Ave	Oak	N	4.77	0.86	355	13.1	0.93	61	15.3	INRIX
T415	MacArthur- Santa Clara - SB	Seminary Ave	Estudillo Ave	Oak- San L	N	**0.32**	0.69	378	12.7	0.88	61	18.5	INRIX

H.2 | AC Transit - AM Period (AVL)

Table H-2: 2018 Transit Monitoring Results for AC Transit - AM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Sample	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
A15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	C	0.49	0.64	186	9.7	1.15	1589	15.0	INRIX
A16	Hesperian - NB	SH 92	La Playa	Hay	C	0.78	0.78	92	15.8	1.25	1536	20.1	INRIX
A17	Hesperian - NB	La Playa	W. Winton Ave.	Hay	C	0.43	0.59	189	12.1	1.18	3011	20.4	INRIX
A18	Hesperian - NB	W. Winton Ave	A St	Hay	C	0.97	0.52	186	11.8	1.16	3574	22.6	INRIX
A19	Hesperian - NB	A St	Hacienda	Uninc	C	0.67	0.72	152	16.8	1.10	2738	23.2	INRIX
A20	Hesperian - NB	Hacienda	Grant	Uninc	C	0.66	0.63	76	15.5	1.07	3345	24.7	INRIX
A21	Hesperian - NB	Grant	Llewelling	Uninc	C	0.27	0.84	112	10.0	1.05	2823	12.0	INRIX
A27	Hesperian - SB	Springlake	Llewelling	Uninc	C	0.39	0.75	181	12.2	0.94	2950	16.2	INRIX
A28	Hesperian - SB	Llewelling	Grant	Uninc	C	0.27	0.82	186	12.8	0.91	3421	15.6	INRIX
A29	Hesperian - SB	Grant	Hacienda	Uninc	C	0.66	0.60	128	13.8	0.92	3541	22.8	INRIX
A30	Hesperian - SB	Hacienda	A St	Uninc	C	0.67	0.47	215	10.0	0.94	3472	21.3	INRIX
A31	Hesperian - SB	A St	W. Winton Ave.	Hay	C	0.97	0.69	209	14.5	0.99	3308	21.1	INRIX
A32	Hesperian - SB	W. Winton Ave	La Playa	Hay	C	0.43	0.67	172	12.8	1.13	3570	18.9	INRIX
A33	Hesperian - SB	La Playa	SH 92	Hay	C	0.78	0.48	198	9.0	0.86	3155	18.9	INRIX
A34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	C	0.49	0.76	172	14.7	0.94	2983	19.2	INRIX
A39	Park/23rd - EB	Encinal	Santa Clara	Ala	N	0.23	0.63	354	6.9	1.06	2654	11.0	INRIX
A40	Park/23rd - EB	Santa Clara	Kennedy	Ala	N	0.68	1.01	369	10.0	0.92	2581	9.9	INRIX
A43	Park/23rd - WB	Kennedy	Santa Clara	Ala	N	0.74	1.16	243	15.4	1.12	52	13.3	INRIX
A44	Park/23rd - WB	Santa Clara	Encinal	Ala	N	0.23	0.82	231	8.9	1.01	2265	10.9	INRIX
A45	MLK Jr Way - NB	SH 24	Adeline	Oak	N	1.48	0.24	173	5.8	0.90	6	24.7	Floating Car
A46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	N	0.28	0.59	137	8.4	0.92	1767	14.2	INRIX
A47	Adeline - NB	MLK Jr - North	Shattuck/Adeline	Berk	N	0.61	0.73	55	13.1	0.98	1756	17.8	INRIX
A48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	N	0.31	0.58	313	9.2	1.18	2218	15.9	INRIX
A49	Shattuck NB	Dwight	University	Berk	N	0.57	0.57	298	7.5	1.14	2149	13.3	INRIX
A50	Shattuck SB	University	Dwight	Berk	N	0.57	0.39	220	5.5	1.06	2577	14.1	INRIX
A51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	N	0.3	0.37	320	7.2	1.06	3018	19.6	INRIX
A53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	N	0.29	0.76	175	10.7	1.08	1853	14.1	INRIX
A54	MLK Jr Way - SB	Adeline	SH 24	Oak	N	1.39	0.39	206	8.5	1.19	6	22.0	Floating Car
A61	University - EB	San Pablo	Sacramento	Berk	N	0.56	0.68	148	12.7	1.03	3073	18.6	INRIX
A62	University - EB	Sacramento	ML King	Berk	N	0.49	0.50	285	10.5	1.05	3206	20.8	INRIX
A63	University - EB	ML King	Shattuck Pl	Berk	N	0.29	0.65	292	10.3	1.37	1740	15.9	INRIX
A64	University - WB	Shattuck Pl	ML King	Berk	N	0.29	0.81	272	12.1	1.04	1252	14.8	INRIX
A65	University - WB	ML King	Sacramento	Berk	N	0.49	0.68	244	14.8	1.14	3118	21.9	INRIX
A83	SR 61 - SB	Atlantic	Cent/Webster	Ala	N	0.57	0.95	90	13.1	1.08	818	13.8	INRIX
A87	SR 61 (Doolittle) - SB	High	Island Dr	Ala	N	0.44	0.61	106	14.2	0.79	2685	23.2	INRIX
A98	SR 61 - NB	Cent/Web	Atlantic	Ala	N	0.57	0.68	112	9.7	0.96	1585	14.2	INRIX
A101	Decoto - WB	SH 238/Mission	Union Square	Uni Cty	S	0.86	0.73	151	14.0	0.86	3529	19.1	INRIX

Table H-2: 2018 Transit Monitoring Results for AC Transit - AM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Sample	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
A102	Decoto - WB	Union Square	Alv-Niles Rd	Uni Cty	S	0.24	0.62	318	11.7	0.97	3135	18.8	INRIX
A103	Decoto - WB	Alv-Niles Rd	Fremont CL	Uni Cty	S	0.65	0.59	212	12.9	1.02	3135	22.0	INRIX
A106	Decoto - EB	Union City CL	Alv-Niles Rd	Uni Cty	S	0.66	0.60	186	14.6	0.93	2922	24.4	INRIX
A107	Decoto - EB	Alv-Niles Rd	Union Square	Uni Cty	S	0.24	0.61	182	12.6	0.97	3399	20.7	INRIX
A108	Decoto - EB	Union Square	SH 238/Mission	Uni Cty	S	0.85	0.41	164	8.6	0.83	380	21.2	INRIX
A111	SR 84/Fremont(Fre)- WB	Peralta	Thornton	Fre	S	0.33	0.83	175	13.4	0.84	1691	16.1	INRIX
A114	SR 84/Fremont (Fre)- EB	Thornton	Peralta	Fre	S	0.32	0.68	275	12.4	0.91	2756	18.1	INRIX
A163	SR 123 San Pablo - SB	Carlson	Washington	Alb	N	0.51	0.69	160	12.4	0.93	3170	17.9	INRIX
A164	SR 123 San Pablo - SB	Washington	Marin	Alb	N	0.36	0.74	284	12.7	1.03	2963	17.2	INRIX
A165	SR 123 San Pablo - SB	Marin	Gilman	Alb - Berk	N	0.45	0.81	336	13.9	1.05	3321	17.1	INRIX
A166	SR 123 San Pablo - SB	Gilman	University	Berk	N	0.81	0.72	353	12.7	1.17	2996	17.6	INRIX
A167	SR 123 San Pablo - SB	University	Allston	Berk	N	0.19	0.68	229	14.0	1.14	3017	20.6	INRIX
A168	SR 123 San Pablo - SB	Allston	Dwight	Berk	N	0.38	0.63	344	13.0	1.15	3017	20.6	INRIX
A169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	N	0.64	0.62	384	12.3	1.05	2543	19.8	INRIX
A170	SR 123 San Pablo - SB	Ashby	Stanford	Oak	N	0.8	0.64	398	12.2	1.06	2875	19.0	INRIX
A171	SR 123 San Pablo - SB	Stanford	53rd	Oak	N	0.27	0.79	386	13.7	1.20	2965	17.3	INRIX
A172	SR 123 San Pablo - SB	53rd	Park	Emery	N	0.34	0.78	295	13.5	1.25	2965	17.3	INRIX
A173	SR 123 San Pablo - SB	Park	35th	Emery -Oak	N	0.44	0.70	272	12.5	1.13	1512	17.8	INRIX
A174	SR 123 San Pablo - NB	35th	Park	Oak -Emery	N	0.42	0.90	364	14.8	1.52	1095	16.4	INRIX
A175	SR 123 San Pablo - NB	Park	53rd	Emery	N	0.34	0.86	169	16.0	1.39	3471	18.7	INRIX
A176	SR 123 San Pablo - NB	53rd	Stanford	Oak	N	0.27	0.59	330	11.1	0.99	3471	18.7	INRIX
A177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	N	0.8	0.69	396	10.7	0.95	3076	15.6	INRIX
A178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	N	0.64	0.67	342	14.8	1.15	1556	22.1	INRIX
A179	SR 123 San Pablo - NB	Dwight	Allston	Berk	N	0.38	0.71	371	13.5	1.08	2167	18.9	INRIX
A180	SR 123 San Pablo - NB	Allston	University	Berk	N	0.19	0.78	298	14.7	1.18	2167	18.9	INRIX
A181	SR 123 San Pablo - NB	University	Gilman	Berk	N	0.81	0.88	217	15.7	1.20	1407	17.9	INRIX
A182	SR 123 San Pablo - NB	Gilman	Marin	Alb - Berk	N	0.45	0.63	236	11.2	1.03	2249	17.9	INRIX
A183	SR 123 San Pablo - NB	Marin	Washington	Alb	N	0.36	0.65	129	12.2	1.01	1562	18.7	INRIX
A192	SR 185 (14th) - SB	San L Blvd	Hesperian	San L	C	0.94	0.70	152	15.2	1.06	2278	21.8	INRIX
A193	SR 185 (14th) - SB	Hesperian	Bayfair	San L	C	0.47	0.76	190	15.0	1.25	862	19.8	INRIX
A194	SR 185 (14th) - SB	Bayfair	170th	Uninc	S	1.19	0.72	184	14.4	1.12	573	20.0	INRIX
A195	SR 185 (14th) - SB	170th	Llewelling	Uninc	S	0.2	0.78	180	16.6	1.02	2359	21.3	INRIX
A198	SR 185 Hayward - NB	A St (SR 92/238 until 2012)	Sunset	Hay	C	0.43	0.78	180	16.0	1.02	1390	20.4	INRIX
A199	SR 185 (14th) - NB	Sunset	Llewelling	Uninc	S	1.05	0.74	200	17.2	1.02	685	23.2	INRIX
A200	SR 185 (14th) - NB	Llewelling	170th	Uninc	S	0.2	0.48	190	12.0	0.96	1752	25.2	INRIX
A201	SR 185 (14th) - NB	170th	Bayfair	Uninc	S	1.19	0.66	202	13.0	1.18	1386	19.8	INRIX
A202	SR 185 (14th) - NB	Bayfair	Hesperian	San L	C	0.47	0.70	271	14.0	0.95	1633	20.1	INRIX
A203	SR 185 (14th) - NB	Hesperian	San L Blvd	San L	C	0.94	0.55	86	10.9	0.99	2986	19.6	INRIX

Table H-2: 2018 Transit Monitoring Results for AC Transit - AM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Sample	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
A220	SR 238 (Mission) - NB	Tamarack	Industrial	Uni Cty - Ha	S	1.96	0.49	128	13.6	0.94	3692	28.0	INRIX
A221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	C	1.46	0.54	99	13.9	0.93	3685	25.6	INRIX
A223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	C	1.83	0.68	86	16.3	0.94	3621	24.1	INRIX
A224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	C	1.46	0.60	136	13.5	0.83	3706	22.6	INRIX
A225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay - Uni Ct	C	1.96	0.60	123	12.5	0.81	3706	20.7	INRIX
A229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	N	1.35	0.75	368	12.4	0.96	2702	16.6	INRIX
A230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	N	1.43	0.34	65	11.4	1.13	300	33.9	INRIX
T1	W. Grand Ave - Grand Ave -EB	I-80/Maritime St	San Pablo Ave	Oak	N	1.63	0.65	107	13.8	1.10	314	21.4	INRIX
T4	W. Grand Ave - Grand Ave -WB	I-580	Broadway	Oak	N	1.08	0.67	230	9.7	0.86	1370	14.5	INRIX
T6	W. Grand Ave - Grand Ave -WB	San Pablo Ave	I-80/Maritime St	Oak	N	1.63	0.39	515	9.8	0.99	2686	24.8	INRIX
T7	11th St - Lake Merritt Blvd - Lakeshore Ave- EB	I-980 ON Ramp/Brush St	Webster	Oak	N	0.6	-	232	7.6	1.33	-	-	Commercial Data Not Available
T8	11th St - Lake Merritt Blvd - Lakeshore Ave- EB	Webster	East side of Lake Merritt Channel	Oak	N	0.66	-	225	10.0	1.27	-	-	Commercial Data Not Available
T9	11th St - Lake Merritt Blvd - Lakeshore Ave- EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	N	1.15	0.82	305	13.6	1.08	187	16.6	INRIX
T10	12th St - Lake Merritt Blvd - Lakeshore Ave- WB	MacArthur Blvd/ I-580 ON Ramp	East side of Lake Merritt Channel	Oak	N	1.15	0.58	161	10.1	1.22	1559	17.5	INRIX
T11	12th St - Lake Merritt Blvd - Lakeshore Ave- WB	East side of Lake Merritt Channel	Webster	Oak	N	0.64	-	459	8.3	1.16	-	-	Commercial Data Not Available
T12	12th St - Lake Merritt Blvd - Lakeshore Ave- WB	Webster	I-980 OFF Ramp/Brush St	Oak	N	0.6	-	689	7.8	1.16	-	-	Commercial Data Not Available
T17	Broadway-SB	Broadway/College Ave	Grand Ave	Oak	N	1.91	0.68	90	9.1	1.07	1523	13.4	INRIX
T18	Broadway-SB	Grand Ave	14th St	Oak	N	0.55	0.69	784	8.4	1.23	1292	12.1	INRIX
T19	Broadway-SB	14th St	5th St/Broadway	Oak	N	0.48	0.97	539	8.8	1.21	1357	9.1	INRIX
T22	Broadway-NB	5th St/Broadway	14th St	Oak	N	0.48	0.73	1152	6.9	1.11	770	9.4	INRIX
T23	Broadway-NB	14th St	Grand Ave	Oak	N	0.55	0.70	485	7.7	1.19	1382	11.0	INRIX
T24	Broadway-NB	Grand Ave	Broadway/College Ave	Oak	N	1.91	0.72	117	10.0	1.20	1091	13.8	INRIX
T25	Durant-EB	Shattuck	College Ave.	Berk	N	0.73	-	222	11.8	1.34	-	-	Commercial Data Not Available
T26	College Ave-SB	Bancroft Way/College Ave	Ashby Ave	Berk	N	0.85	0.68	102	10.2	1.12	725	14.9	INRIX
T28	College Ave-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Oak	N	0.61	0.71	76	10.8	1.06	1558	15.2	INRIX

Table H-2: 2018 Transit Monitoring Results for AC Transit - AM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Sample	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
T31	College Ave-NB	Ashby Ave	Bancroft Way/College Ave	Berk	N	0.85	0.85	209	12.3	1.29	1485	14.4	INRIX
T32	Bancroft-WB	College Ave.	Shattuck	Berk	N	0.73	0.71	248	9.3	1.35	440	13.0	INRIX
T35	Shattuck Ave-NB	51st	Alcatraz Ave.	Oak - Berk	N	0.81	0.61	54	12.3	1.04	2002	20.3	INRIX
T36	Shattuck Ave-NB	Alcatraz Ave.	Adeline St.	Berk	N	0.7	0.37	197	6.0	1.02	1707	16.3	INRIX
T37	Shattuck Ave-SB	Adeline St.	Alcatraz Ave.	Berk	N	0.7	0.47	201	8.0	1.08	2492	16.9	INRIX
T38	Shattuck Ave-SB	Alcatraz Ave.	51st	Oak	N	0.81	0.34	53	6.7	0.97	2880	19.7	INRIX
T44	40thSt- Shellmound Ave- EB	40th St	San Pablo Ave	Emery	N	0.68	0.90	90	15.7	1.13	333	17.5	INRIX
T45	40thSt- Shellmound Ave- WB	San Pablo Ave	40th St	Emery	N	0.68	0.53	130	11.2	1.00	534	21.1	INRIX
T46	40thSt- Shellmound Ave- WB	40th St	Shellmound Way (north of Powell St)	Emery	N	0.73	-	224	10.3	0.91	-	-	Commercial Data Not Available
T49	International Blvd-NB	14th Ave	Lake Merritt Blvd	Oak	N	0.88	0.76	130	12.7	0.95	878	16.7	INRIX
T50	International Blvd-SB	Lake Merritt Blvd	14th Ave	Oak	N	0.88	0.82	205	15.6	1.11	196	19.0	INRIX
T54	Foothill Blvd- NB	73rd Ave/Foothill Blvd	Seminary Ave	Oak	N	1.02	0.69	80	11.1	0.87	113	16.0	INRIX
T55	Foothill Blvd- NB	Seminary Ave	High St	Oak	N	1.22	0.55	260	9.4	0.74	446	16.9	INRIX
T56	Foothill Blvd- NB	High St	Fruitvale Ave	Oak	N	0.9	1.05	216	10.0	0.85	438	9.5	INRIX
T57	Foothill Blvd- NB	Fruitvale Ave	14th Ave	Oak	N	1.32	0.56	239	10.6	0.87	465	19.0	INRIX
T58	Foothill Blvd- NB	14th Ave	1st Ave/Lake Shore Blvd	Oak	N	0.88	0.59	209	11.8	0.91	117	20.0	INRIX
T60	Foothill Blvd-SB	14th Ave	Fruitvale Ave	Oak	N	1.32	0.70	257	12.8	0.98	62	18.1	INRIX
T61	Foothill Blvd-SB	Fruitvale Ave	High St	Oak	N	0.9	0.75	250	10.4	0.93	307	13.9	INRIX
T62	Foothill Blvd-SB	High St	Seminary Ave	Oak	N	1.22	0.72	247	13.2	1.04	353	18.4	INRIX
T63	Foothill Blvd-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	N	1.02	0.93	111	14.1	1.11	269	15.1	INRIX
T65	E. 15th St-SB/14th Ave	1st Ave	Foothill Blvd/14th Ave	Oak	N	0.98	-	248	13.0	1.07	-	-	Commercial Data Not Available
T98	Hesperian - Union City Blvd-NB	Union City/ Alvarado Blvd	Whipple Rd	Uni Cty	S	0.98	0.72	163	17.6	0.98	2405	24.6	INRIX
T99	Hesperian B- Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	S	0.3	0.70	75	18.4	1.16	3545	26.5	INRIX
T100	Hesperian B- Union City Blvd-NB	Hesperian/Union City/overbridge	Industrial Blvd	Hay	S	0.57	0.72	189	13.7	1.04	3507	19.1	INRIX
T101	Hesperian - Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperia n	Hay	S	1.05	0.65	145	15.3	0.98	3323	23.4	INRIX
T102	Hesperian - Union City Blvd-SB	Tennyson/ Hesperian	Industrial Blvd	Hay	S	1.05	0.62	197	10.3	0.70	3555	16.6	INRIX
T103	Hesperian - Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Hay	S	0.57	0.77	174	17.0	1.04	1718	22.0	INRIX

Table H-2: 2018 Transit Monitoring Results for AC Transit - AM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Sample	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
T104	Hesperian - Union City Blvd-SB	Hesperian/Union City/overbridge	Whipple Rd	Uni Cty	S	0.3	0.60	158	15.5	0.86	3700	25.6	INRIX
T105	Hesperian - Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Uni Cty	S	0.98	0.38	182	9.6	0.85	3588	25.2	INRIX
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Uni Cty	S	0.51	0.86	187	16.2	0.93	1627	18.9	INRIX
T109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Uni Cty	S	0.51	0.69	194	12.0	0.89	2410	17.5	INRIX
T117	Fremont Blvd- NB	Mowry Ave	Peralta Blvd	Fre	S	1.21	0.54	221	11.3	0.79	1493	20.9	INRIX
T118	Fremont Blvd- NB	Peralta Blvd	Thornton Ave	Fre	S	0.33	0.66	206	10.6	0.92	1433	16.1	INRIX
T119	Fremont Blvd- NB	Thornton Ave	Decoto Rd	Fre	S	1.33	0.51	179	12.1	0.62	2075	23.5	INRIX
T124	Fremont Blvd- SB	Decoto Rd	Thornton Ave	Fre	S	1.33	0.60	175	13.0	0.87	2649	21.7	INRIX
T125	Fremont Blvd- SB	Thornton Ave	Peralta Blvd	Fre	S	0.32	0.68	276	12.1	0.92	2908	17.7	INRIX
T196	23rd Ave from 23rd Ave NB/SB Split to E 11th	23rd Ave NB/SB Split	E 11th	Oak	N	0.15	0.41	921	7.6	1.03	3831	18.5	INRIX
T203	55th St from Market St to Shattuck Ave	Market St	Shattuck Ave	Oak	N	0.52	-	353	7.8	0.95	-	-	Commercial Data Not Available
T208	8th St - WB	Harrison	Broadway	Oak	N	0.22	1.05	280	10.2	1.07	1438	9.7	INRIX
T214	Alvarado- Niles/Smith/Niles Blvd- EB	Union City Blvd	Mission Blvd	Fre	S	6.89	0.64	385	13.5	0.95	1148	21.0	INRIX
T232	Durant Ave from Shattuck Ave to College Ave	Shattuck Ave	College Ave	Berk	N	0.73	-	252	11.7	1.22	-	-	Commercial Data Not Available
T233	Dyer St - SB	Whipple Road	Alvarado Blvd	Uni City	S	1.15	0.58	298	13.2	0.95	2169	22.8	INRIX
T244	Fruitvale Ave - NB	Tilden Way	MacArthur Blvd	Ala	N	2.37	0.56	663	7.3	1.00	317	13.1	INRIX
T247	Harrison St-Oakland Ave - EB	20th St	MacArthur Blvd	Oak	N	0.99	0.52	302	10.0	0.95	579	19.2	INRIX
T248	High St - NB	I-580	MacArthur Blvd	Oak	N	0.05	1.56	309	13.9	0.94	1779	8.9	INRIX
T255	MacArthur- Santa Clara - WB	Estudillo Ave	Seminary Ave	San L - Oak	C	4.36	0.67	439	11.6	0.92	146	17.3	INRIX
T258	Market St - NB	55th St	Stanford Ave	Oak	N	0.36	0.67	91	11.7	1.01	909	17.6	INRIX
T260	Martin Luther King Jr Way - NB	San Pablo Ave	47th St	Oak	N	1.78	0.38	322	6.9	1.07	54	18.2	INRIX
T266	Otis Dr from Park St to Broadway	Park St	Broadway	Ala	N	0.24	-	126	15.0	0.92	-	-	Commercial Data Not Available
T269	Park St - NB	Otis Dr	Encinal Ave	Ala	N	0.42	0.84	214	13.4	1.00	1405	16.0	INRIX
T277	Santa Clara Ave from Webster St to Broadway	Webster St	Broadway	Ala	N	2.28	-	285	13.3	0.98	-	-	Commercial Data Not Available
T279	Shattuck Ave from University Ave to Marin Ave	University Ave	Marin Ave	Oak	N	1.27	-	643	6.3	1.05	-	-	Commercial Data Not Available

Table H-2: 2018 Transit Monitoring Results for AC Transit - AM Period (AVL)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Sample	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
T280	Solano Ave from San Pablo Blvd to Sutter St	San Pablo Blvd	Sutter St	Oak	N	1.47	-	59	9.4	1.14	-	-	Commercial Data Not Available
T302	20th St from San Pablo Ave to Harrison St	an Pablo Ave	Harrison St	Oak	N	0.51	-	840	7.4	1.02	-	-	Commercial Data Not Available
T309	55th St from Market St to Shattuck Ave	Market St	Shattuck Ave	Oak	N	0.52	-	294	8.0	0.93	-	-	Commercial Data Not Available
T335	Durant Ave from Shattuck Ave to College Ave	Shattuck Ave	College Ave	Berk	N	0.73	-	305	12.1	1.30	-	-	Commercial Data Not Available
T336	Dyer St - NB	Alvarado Blvd	Whipple Road	Uni City	S	1.15	0.62	390	12.5	1.02	1433	20.3	INRIX
T347	Fruitvale Ave - SB	MacArthur Blvd	Tilden Way	Ala	N	2.37	0.70	840	9.3	1.04	259	13.3	INRIX
T350	Harrison St-Oakland Ave - SB	MacArthur Blvd	20th St	Oak	N	0.99	0.70	329	10.2	0.92	1646	14.5	INRIX
T351	High St - WB	MacArthur Blvd	I-580	Oak	N	0.05	0.95	146	13.2	0.91	1718	14.0	INRIX
T361	Market St - SB	Stanford Ave	55th St	Oak	N	0.36	0.59	131	10.6	0.96	1725	17.9	INRIX
T363	Martin Luther King Jr Way - SB	47th St	San Pablo Ave	Oak	N	1.78	0.29	251	6.2	1.14	80	21.7	INRIX
T369	Otis Dr from Park St to Broadway	Park St	Broadway	Ala	N	0.24	-	94	15.7	0.96	-	-	Commercial Data Not Available
T372	Park St - SB	Encinal Ave	Otis Dr	Ala	N	0.42	0.74	92	12.1	0.89	1291	16.4	INRIX
T380	Santa Clara Ave from Webster St to Broadway	Webster St	Broadway	Ala	N	2.28	-	305	13.4	1.03	-	-	Commercial Data Not Available
T382	Shattuck Ave from University Ave to Marin Ave	University Ave	Marin Ave	Berk	N	1.18	-	728	6.7	1.08	-	-	Commercial Data Not Available
T409	Santa Clara - NB	I-580	Oakland Ave	Oak	N	0.82	0.64	301	11.9	0.93	790	18.6	INRIX
T410	MacArthur- Santa Clara - WB	Seminary Ave	Grand Ave	Oak	N	4.79	0.89	275	12.3	0.92	53	13.9	INRIX
T411	MacArthur- Santa Clara from Grand Ave to Piedmont Ave	Grand Ave	Piedmont Ave	Oak	N	0.45	-	149	11.9	0.90	-	-	Commercial Data Not Available
T413	MacArthur- Santa Clara from Piedmont Ave to Grand Ave	Piedmont Ave	Grand Ave	Oak	N	0.45	-	269	12.5	0.92	-	-	Commercial Data Not Available
T414	MacArthur- Santa Clara - EB	Grand Ave	Seminary Ave	Oak	N	4.77	0.87	273	13.7	0.97	61	15.7	INRIX
T415	MacArthur- Santa Clara - SB	Seminary Ave	Estudillo Ave	Oak- San L	N	0.32	0.57	445	12.8	0.89	51	22.4	INRIX

H.3 | LAVTA - PM Period (Stop Point Data)

Table H-3: 2018 Transit Monitoring Results for LAVTA - PM Period (Stop Point Data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Method	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
A137	Airway Blvd (old SR 84) - NB	SR 84	I-580 EB off ramp	Liv	E	1.06	0.85	Stop Point	28.0	1.08	1510	33.0	INRIX
A138	Airway Blvd (old SR 84) - SB	I-580 EB off ramp	SR 84	Liv	E	1.06	0.91	Stop Point	28.7	1.17	864	31.5	INRIX
T168	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	SR 84/Isabel Ave	Murrita Blvd	Liv	E	0.91	0.97	Stop Point	26.0	0.93	3611	26.8	INRIX
T169	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	Murrita Blvd	S Livermore Ave	Liv	E	1.07	0.41	Stop Point	8.9	0.87	2371	21.8	INRIX
T170	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	S Livermore Ave	Inman St	Liv	E	0.46	0.51	Stop Point	8.9	0.87	450	17.5	INRIX
T171	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Inman St	S Livermore Ave	Liv	E	0.46	1.00	Stop Point	13.6	0.97	194	13.7	INRIX
T172	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	S Livermore Ave	Murrita Blvd	Liv	E	1.07	0.70	Stop Point	13.6	0.97	1020	19.5	INRIX
T173	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	E	0.91	0.79	Stop Point	27.5	1.01	2664	34.8	INRIX
T178	Santa Rita Road- EB	Stoneridge Dr/ Santa Rita Road	W. Los Positas Blvd	Plea	E	0.29	0.42	Stop Point	11.7	0.86	3424	28.2	INRIX
T181	Santa Rita Road- WB	W. Los Positas Blvd	Santa Rita Road	Plea	E	0.29	0.59	Stop Point	15.0	0.83	3449	25.4	INRIX
T187	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	E	0.63	1.47	Stop Point	26.0	0.93	3640	17.7	INRIX
T188	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Plea	E	0.86	1.10	Stop Point	26.0	0.93	3171	23.6	INRIX
T189	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Plea - Uninc	E	2.98	0.53	Stop Point	26.0	0.93	3675	48.9	INRIX
T190	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Plea - Uninc	E	2.98	0.54	Stop Point	27.5	1.01	3148	51.1	INRIX
T191	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Plea	E	0.86	1.01	Stop Point	27.5	1.01	1400	27.2	INRIX
T192	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Plea	E	0.63	1.44	Stop Point	27.5	1.01	2255	19.1	INRIX
T231	Dublin Boulevard - EB	Tassajara Road	Fallon Road	Dub	E	1.24	-	Stop Point	28.7	1.17		-	Commercial Data Not Available
T236	East Avenue - EB	Livermore Avenue	Vasco Road	Liv	E	2.53	0.75	Stop Point	22.2	1.07	1577	29.8	INRIX
T239	Fallon Road - EB	I-580	Tassajara Road	Dub	E	2.85	-	Stop Point	28.7	1.17		-	Commercial Data Not Available
T254	Livermore Avenue EB	I-580	Tesla Road	Liv	E	3.29	0.99	Stop Point	22.2	1.07	596	22.4	INRIX
T256	Main St-Santa Rita Rd - EB	Bernal Avenue	Stoneridge Drive	Plea	E	3.10	-	Stop Point	13.3	0.91		-	Commercial Data Not Available

Table H-3: 2018 Transit Monitoring Results for LAVTA - PM Period (Stop Point Data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Method	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
T264	North Canyons Parkway-Portola - EB	Airway Boulevard	1st Street	Liv	E	4.20	-	Stop Point	16.5	0.88		-	Commercial Data Not Available
T267	Owens Drive - EB	Willow Road	W Las Positas Blvd	Plea	E	1.10	0.65	Stop Point	13.3	0.91	2988	20.5	INRIX
T292	W Las Positas Blvd - EB	Owens Drive	Santa Rita Road	Plea	E	0.22	0.77	Stop Point	13.3	0.91	2637	17.3	INRIX
T334	Dublin Boulevard - WB	Tassajara Road	Fallon Road	Dub	E	1.24	-	Stop Point	28.0	1.08		-	Commercial Data Not Available
T339	East Avenue - WB	Vasco Road	Livermore Avenue	Liv	E	2.53	0.70	Stop Point	18.6	0.99	1750	26.5	INRIX
T342	Fallon Road - WB	I-580	Tassajara Road	Dub	E	2.85	-	Stop Point	28.0	1.08		-	Commercial Data Not Available
T357	Livermore Avenue WB	I-580	Tesla Road	Liv	E	3.29	0.91	Stop Point	18.6	0.99	329	20.4	INRIX
T359	Main St-Santa Rita Rd - WB	Bernal Avenue	Stoneridge Drive	Plea	E	3.10	0.77	Stop Point	13.0	0.91	3151	16.9	INRIX
T367	North Canyons Parkway-Portola - WB	Airway Boulevard	1st Street	Liv	E	4.20	-	Stop Point	19.2	0.86		-	Commercial Data Not Available
T370	Owens Drive - WB	Willow Road	W Las Positas Blvd	Plea	E	1.10	0.66	Stop Point	13.0	0.91	2205	19.7	INRIX
T395	W Las Positas Blvd - WB	Owens Drive	Santa Rita Road	Plea	E	**0.22**	0.69	Stop Point	13.0	0.91	1018	19.0	INRIX

H.4 | LAVTA - AM Period (Stop Point Data)

Table H-4: 2018 Transit Monitoring Results for LAVTA - AM Period (Stop Point Data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Method	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
A137	Airway Blvd (old SR 84) - NB	SR 84	I-580 EB off ramp	Liv	E	1.06	0.93	Stop Point	28.7	1.10	1480	31.0	INRIX
A138	Airway Blvd (old SR 84) - SB	I-580 EB off ramp	SR 84	Liv	E	1.06	0.81	Stop Point	26.1	1.06	565	32.4	INRIX
T168	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	SR 84/Isabel Ave	Murrita Blvd	Liv	E	0.91	1.19	Stop Point	30.0	1.08	2082	25.1	INRIX
T169	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	Murrita Blvd	S Livermore Ave	Liv	E	1.07	0.51	Stop Point	11.2	1.09	699	22.1	INRIX
T170	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	S Livermore Ave	Inman St	Liv	E	0.46	0.60	Stop Point	11.2	1.09	93	18.8	INRIX
T171	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Inman St	S Livermore Ave	Liv	E	0.46	0.78	Stop Point	17.2	1.22	325	22.1	INRIX
T172	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	S Livermore Ave	Murrita Blvd	Liv	E	1.07	0.76	Stop Point	17.2	1.22	2809	22.8	INRIX
T173	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	E	0.91	0.67	Stop Point	23.6	0.87	3649	35.1	INRIX

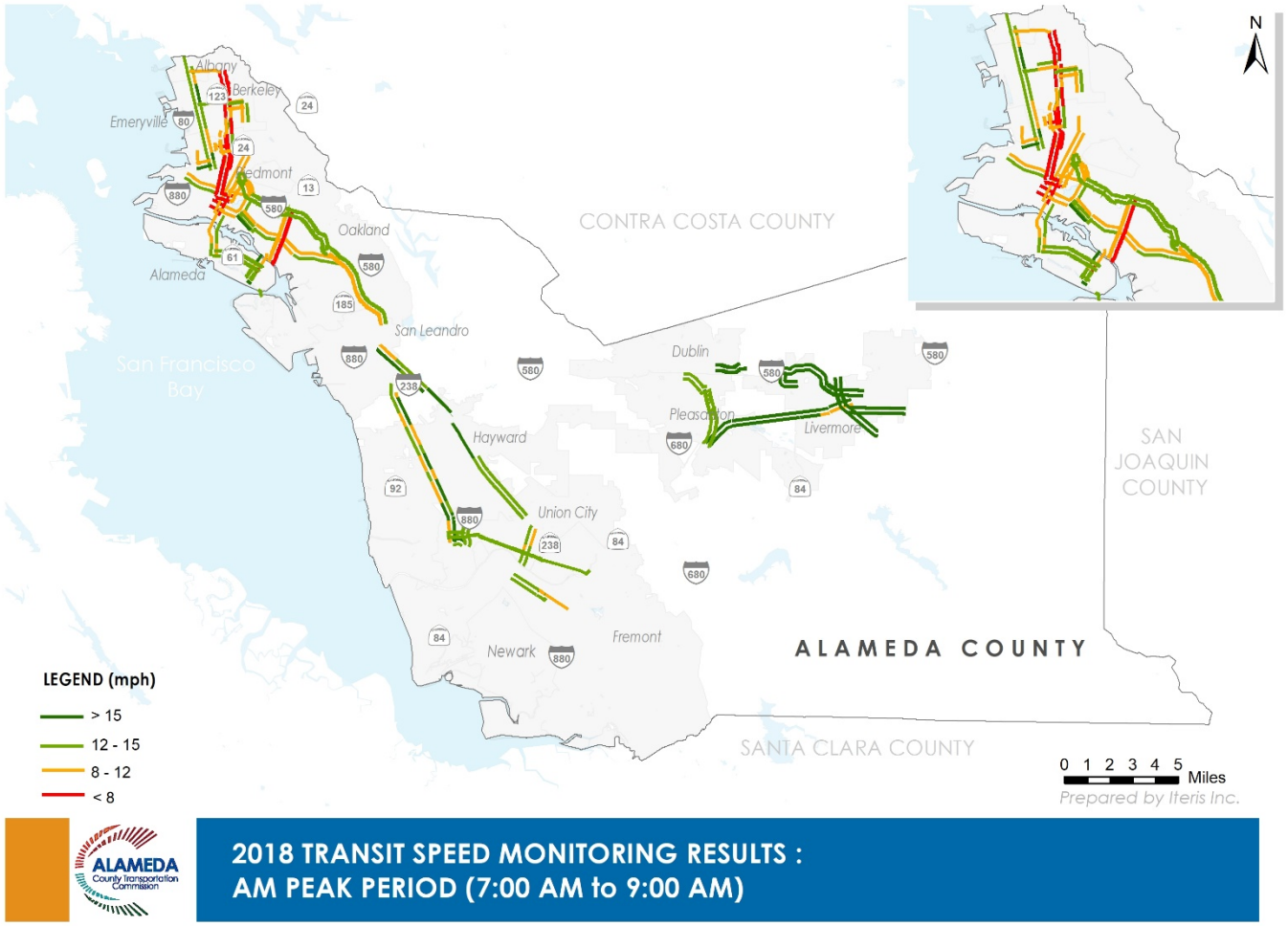
Table H-4: 2018 Transit Monitoring Results for LAVTA - AM Period (Stop Point Data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Method	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
T178	Santa Rita Road-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Plea	E	0.29	0.46	Stop Point	13.1	0.96	3170	28.6	INRIX
T181	Santa Rita Road-WB	W. Los Positas Blvd	Santa Rita Road	Plea	E	0.29	0.68	Stop Point	17.0	0.94	3529	25.1	INRIX
T187	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	E	0.63	1.32	Stop Point	30.0	1.08	3002	22.8	INRIX
T188	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Plea	E	0.86	1.10	Stop Point	30.0	1.08	1313	27.3	INRIX
T189	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Plea - Uninc	E	2.98	0.63	Stop Point	30.0	1.08	2895	47.4	INRIX
T190	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Plea - Uninc	E	2.98	0.47	Stop Point	23.6	0.87	3695	50.4	INRIX
T191	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	Bernal Ave/ Valley Ave	Ray/Vineyard	Plea	E	0.86	0.90	Stop Point	23.6	0.87	3245	26.4	INRIX
T192	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Plea	E	0.63	1.48	Stop Point	23.6	0.87	3538	16.0	INRIX
T231	Dublin Boulevard - EB	Tassajara Road	Fallon Road	Dub	E	1.24	-	Stop Point	26.1	1.06		-	Commercial Data Not Available
T236	East Avenue- EB	Livermore Ave	Vasco Road	Liv	E	2.53	0.76	Stop Point	22.0	1.06	1698	28.9	INRIX
T239	Fallon Road- EB	Tassajara Road	I-580	Dub	E	2.85	-	Stop Point	26.1	1.06		-	Commercial Data Not Available
T254	Livermore Avenue - EB	I-580	Tesla Road	Liv	E	3.3	0.90	Stop Point	22.0	1.06	612	24.4	INRIX
T256	Main St- Santa Rita Rd - EB	Stoneridge Drive	Bernal Avenue	Plea	E	3.1	-	Stop Point	13.7	0.93		-	Commercial Data Not Available
T264	North Canyons Parkway-Portola - EB	Airway Boulevard	1st Street	Liv	E	4.2	-	Stop Point	18.1	0.96		-	Commercial Data Not Available
T267	Owens Drive - EB	Willow Road	W Las Positas Blvd	Plea	E	1.1	0.64	Stop Point	13.7	0.93	967	21.5	INRIX
T292	W Las Positas Blvd - EB	Owens Drive	Santa Rita Road	Plea	E	0.22	0.88	Stop Point	13.7	0.93	887	15.6	INRIX
T334	Dublin Boulevard - WB	Fallon Road	Tassajara Road	Dub	E	1.24	-	Stop Point	28.7	1.10		-	Commercial Data Not Available
T339	East Avenue- WB	Vasco Road	Livermore Avenue	Liv	E	2.53	0.60	Stop Point	15.5	0.82	1926	25.6	INRIX
T342	Fallon Road- WB	I-580	Tassajara Road	Dub	E	2.85	-	Stop Point	28.7	1.10		-	Commercial Data Not Available
T357	Livermore Avenue - WB	I-580	Tesla Road	Liv	E	3.3	0.68	Stop Point	15.5	0.82	253	22.7	INRIX

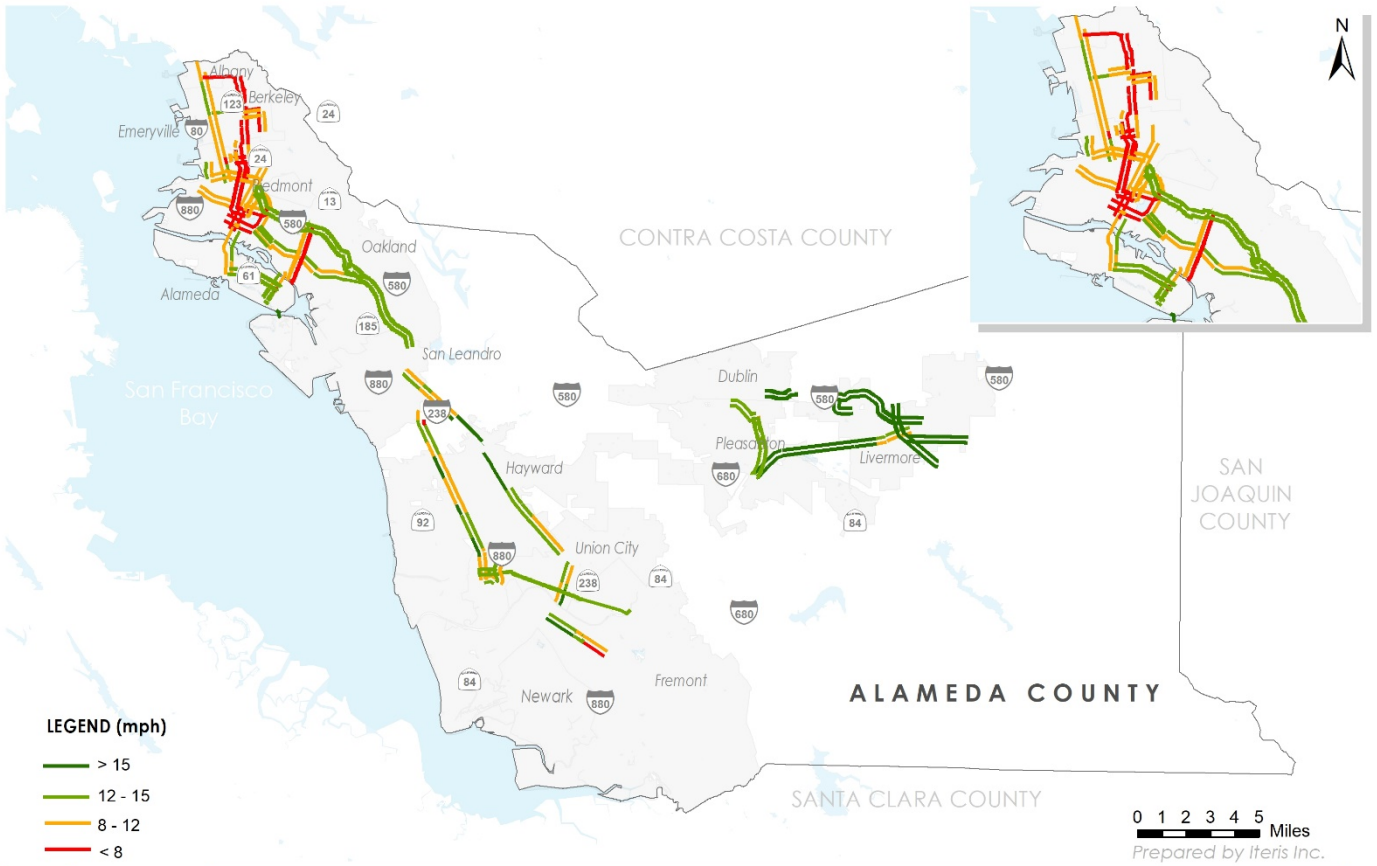
Table H-4: 2018 Transit Monitoring Results for LAVTA - AM Period (Stop Point Data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	Transit					Auto	
		From	To				Transit- to-Auto Ratio	Method	Speed	Peak-to- Off-peak Ratio	Sample	Speed	Method
T359	Main St- Santa Rita Rd - WB	Bernal Avenue	Stoneridge Drive	Plea	E	3.1	0.76	Stop Point	13.3	0.93	3312	17.5	INRIX
T367	North Canyons Parkway-Portola - WB	1st Street	Airway Boulevard	Liv	E	4.2	-	Stop Point	20.0	0.90		-	Commercial Data Not Available
T370	Owens Drive - WB	W Las Positas Blvd	Willow Road	Plea	E	1.10	0.58	Stop Point	13.3	0.93	1570	23.1	INRIX
T395	W Las Positas Blvd - WB	Santa Rita Road	Owens Drive	Plea	E	0.22	0.68	Stop Point	13.3	0.93	1074	19.5	INRIX

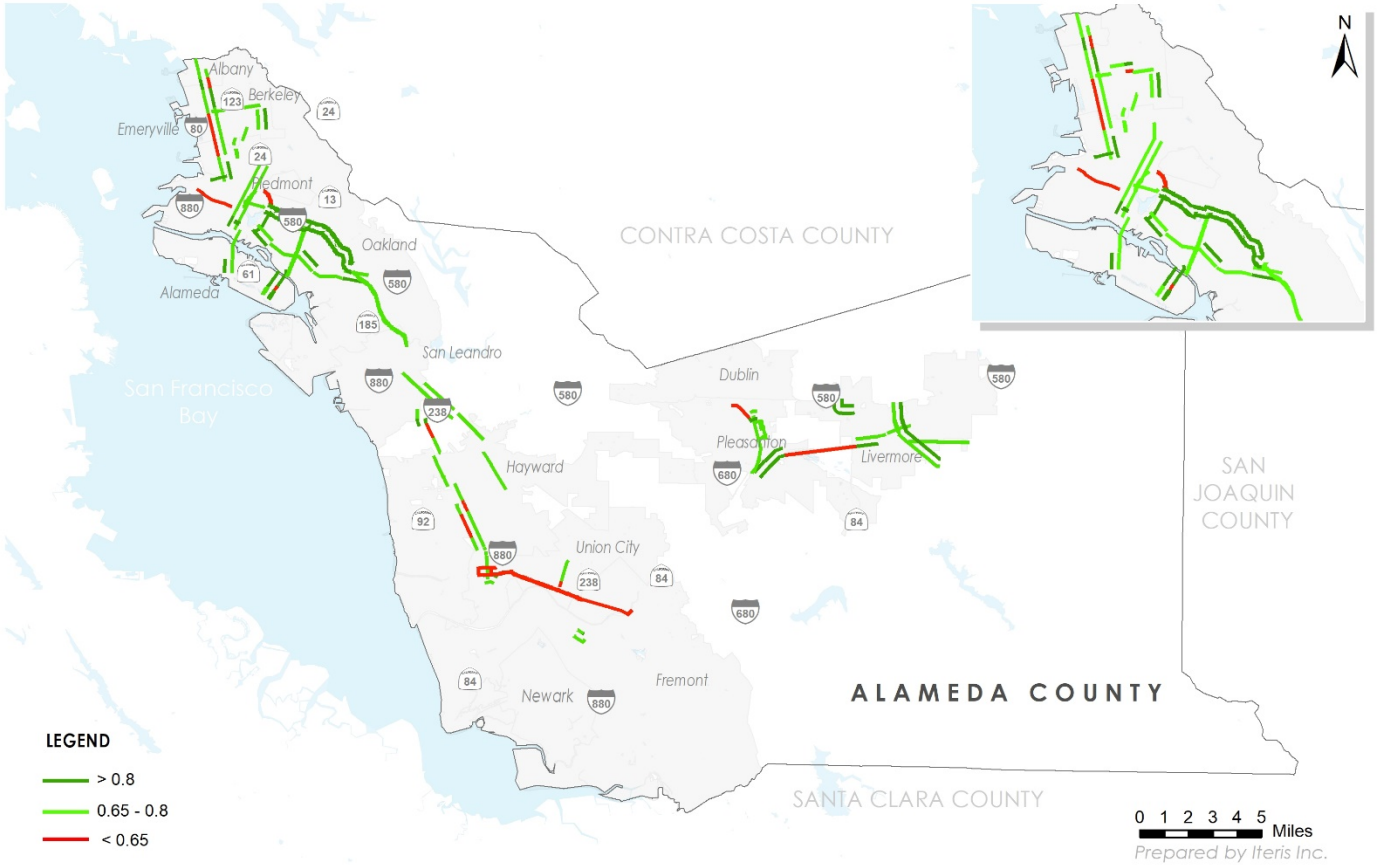
Appendix I | 2018 Transit Monitoring Maps



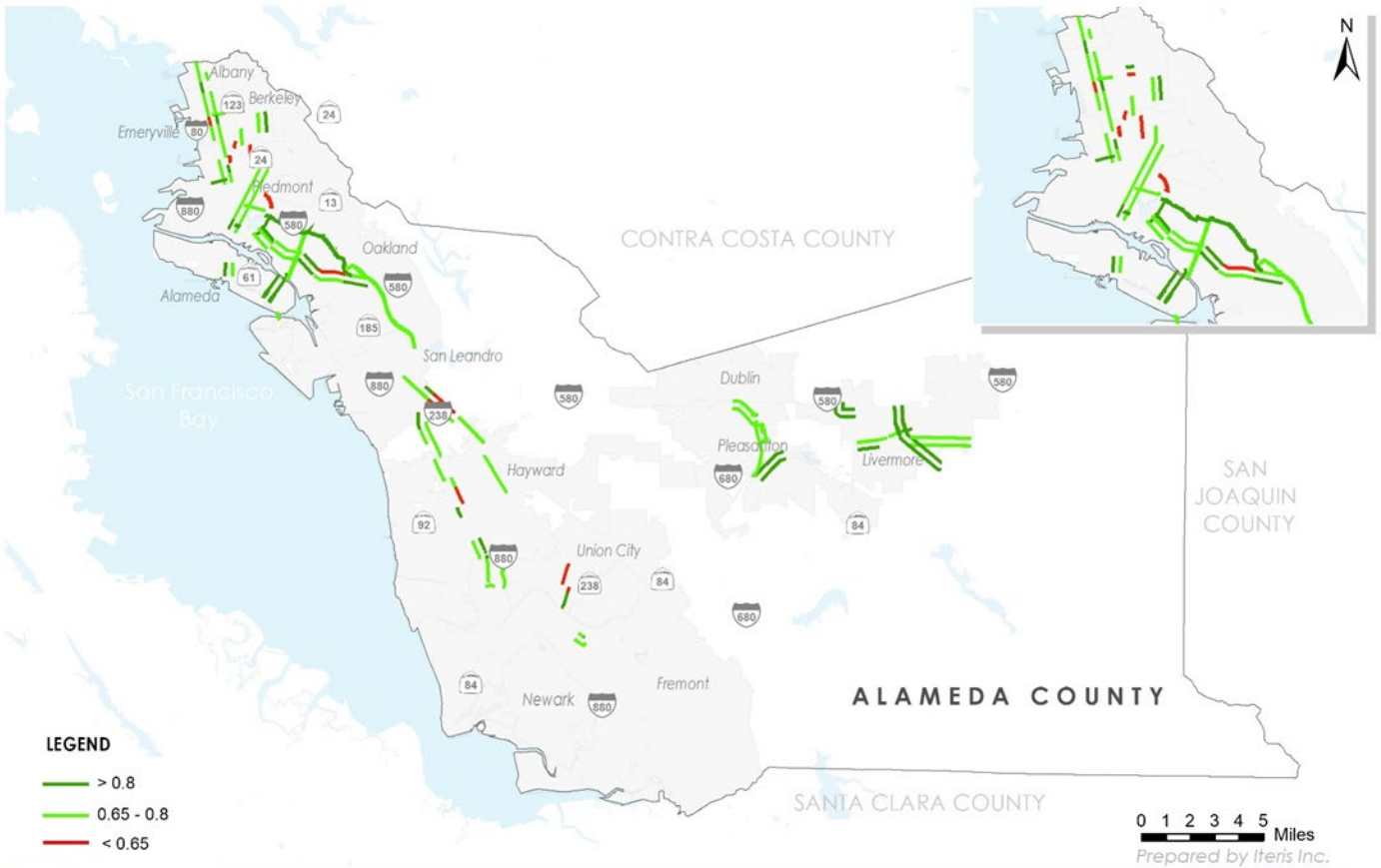
2018 TRANSIT SPEED MONITORING RESULTS :
AM PEAK PERIOD (7:00 AM to 9:00 AM)



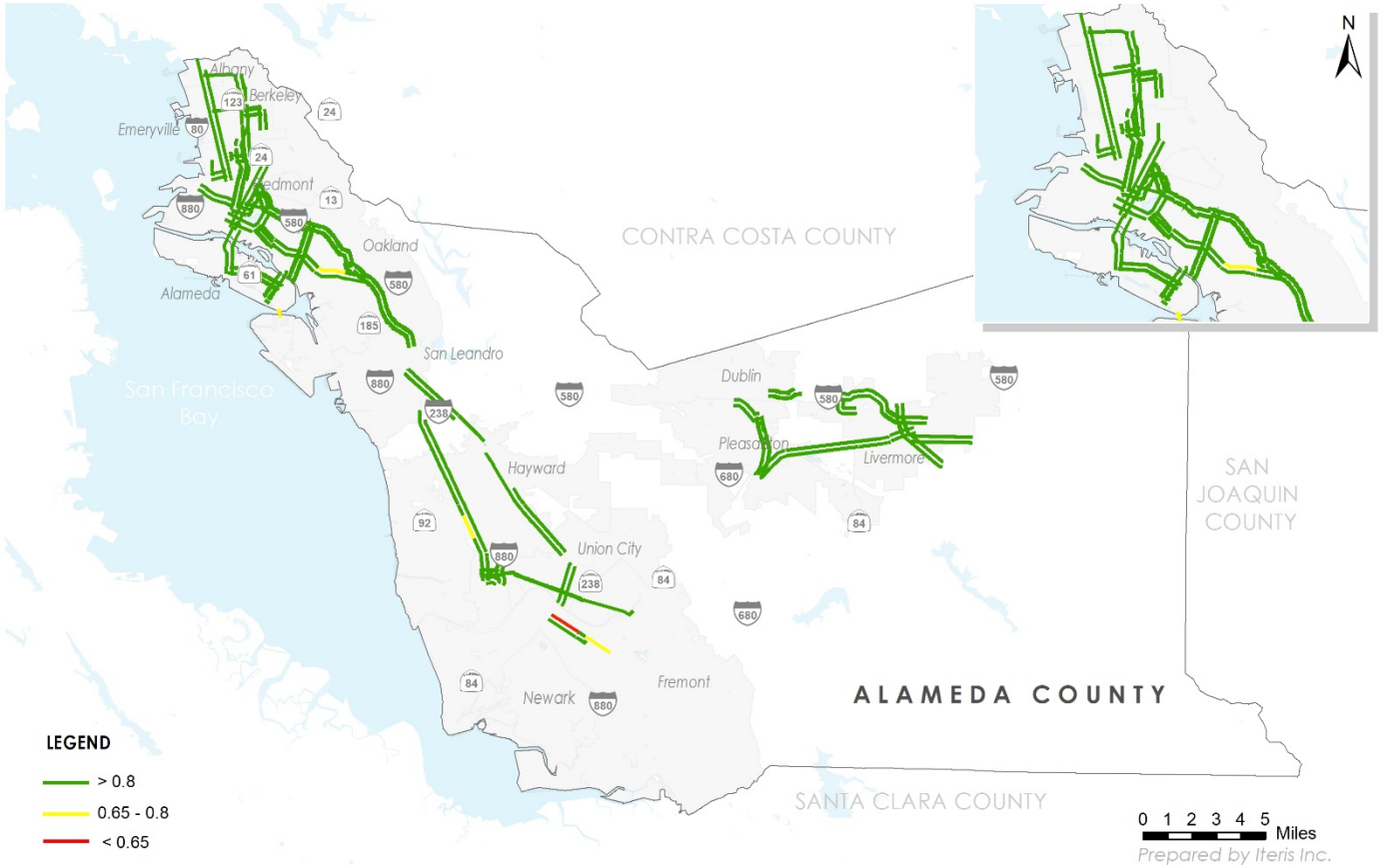
2018 TRANSIT SPEED MONITORING RESULTS :
PM PEAK PERIOD (4:00 PM to 6:00 PM)



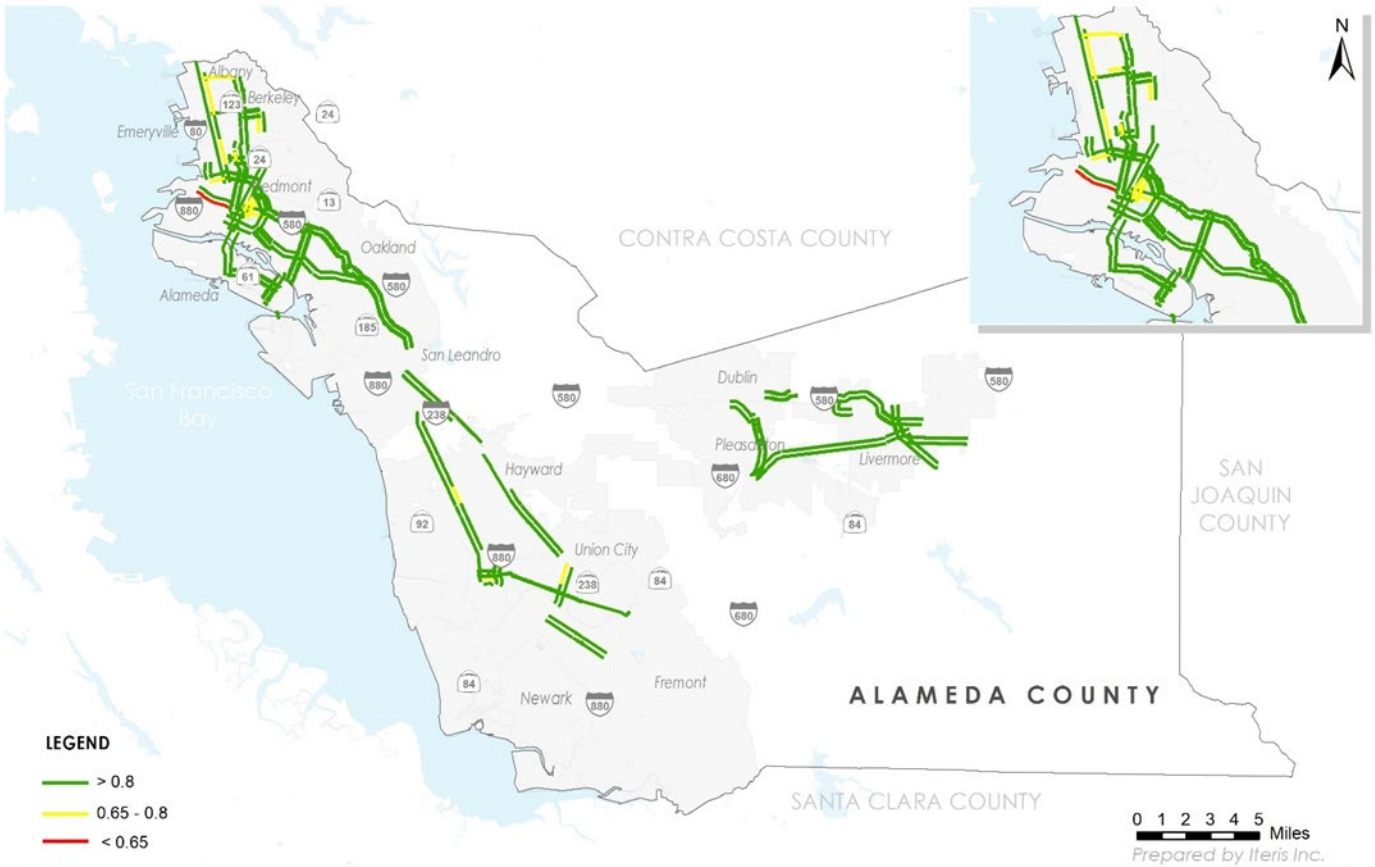
2018 RATIO OF AVERAGE BUS SPEEDS TO AUTO SPEEDS : AM PEAK PERIOD (7:00 AM to 9:00 AM)



2018 RATIO OF AVERAGE BUS SPEEDS TO AUTO SPEEDS : PM PEAK PERIOD (4:00 PM to 6:00 PM)



2018 RATIO OF PEAK PERIOD TO NON-PEAK TRANSIT SPEED : AM PEAK PERIOD (7:00 AM to 9:00 AM)



2018 RATIO OF PEAK PERIOD TO NON-PEAK TRANSIT SPEED : PM PEAK PERIOD (4:00 PM to 6:00 PM)

Alameda County Transportation Commission
1111 Broadway, Suite 800 • Oakland, CA 94607
510.208.7400 • www.AlamedaCTC.org

prepared by **Iteris, Inc.**