

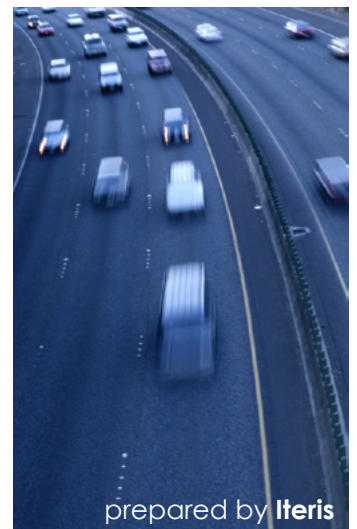
Alameda CTC

2014 Level of Service Monitoring Report

November 2014



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



prepared by Iferis

2014

LEVEL OF SERVICE MONITORING
ON THE CONGESTION MANAGEMENT PROGRAM
ROADWAY NETWORK

ALAMEDA COUNTY TRANSPORTATION COMMISSION

November 2014

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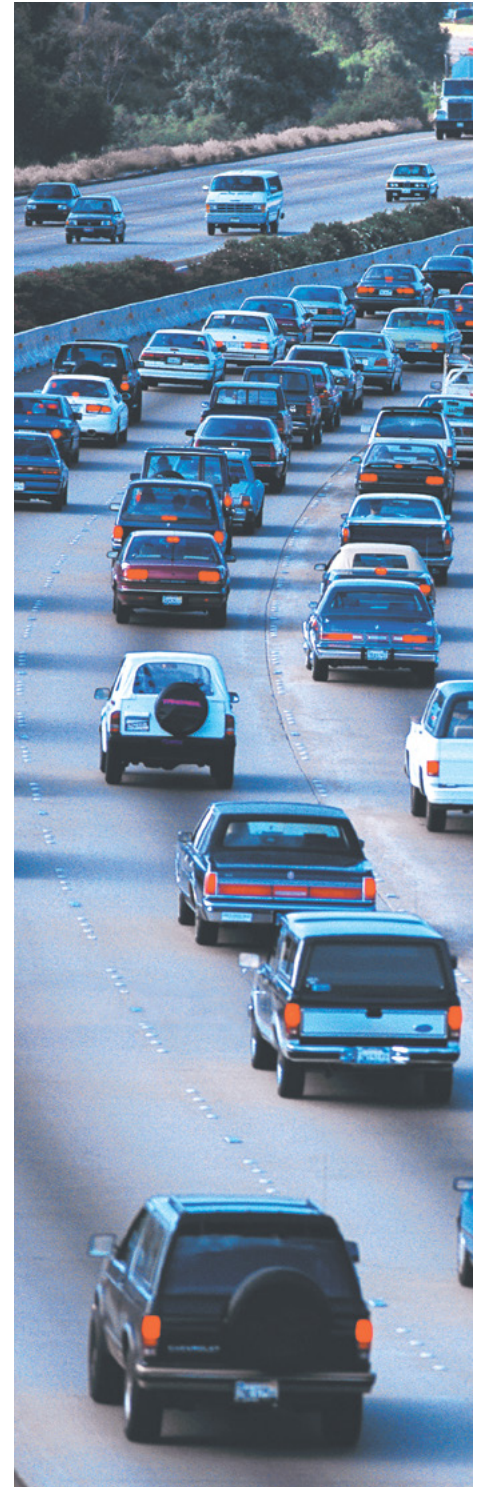
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Every two years, the Alameda County Transportation Commission (Alameda CTC) measures traffic conditions on major Alameda County roadway facilities that are designated as the Congestion Management Program (CMP) network. As the Congestion Management Agency (CMA) for the county, Alameda CTC undertakes this monitoring not only to comply with the state law, but also to utilize it as an opportunity to understand the performance of the county's key roadways that lead to informed transportation decisions. The state congestion management legislation requires the CMAs to designate a CMP network and adopt LOS standards to monitor the network performance at least biennially. The focus of the LOS monitoring is to measure average travel speeds on the county roadways, identify congested segments and assess long term congestion trends on the CMP network. Traffic conditions are evaluated using level of service (LOS) standards based on the Highway Capacity Manual (HCM). As required by the state law, if a CMP segment is found to operate at LOS F conditions during any monitoring cycle, after applicable exemptions, a deficiency plan is required to be prepared to improve the performance of that CMP segment.

Alameda County CMP Network

The entire CMP network in Alameda County consists of approximately 327 miles of roadways. The CMP network is divided into two tiers (**Figure ES-1**). Tier 1 roadways are a part of the CMP network that was initially adopted in 1991 and updated in 1992. These include all freeways, state highways, selected principal arterials and freeway ramp connectors. Tier 2 roadways were added during an update to the CMP network in 2011 and include principal and major arterials. Monitoring of Tier 1 roadways in the afternoon peak period is subject to CMP conformity. Monitoring of Tier 1 roadways in the morning peak period and Tier 2 roadways for both peak periods are for information purposes only.

In addition to the Tier 1 and Tier 2 roadways, Alameda CTC monitors the three Bay crossing bridges connecting the county to San Francisco and the Peninsula. It also conducts travel time surveys between 10 origin and destination (OD) pairs using multiple modes of transportation. Starting in the 2014 monitoring cycle, Alameda CTC also began monitoring 84 miles of mainline freeway HOV and express lanes. This additional data is collected for information purposes only.



¹ Network length is updated based on the measurements noted during the 2014 monitoring cycle.

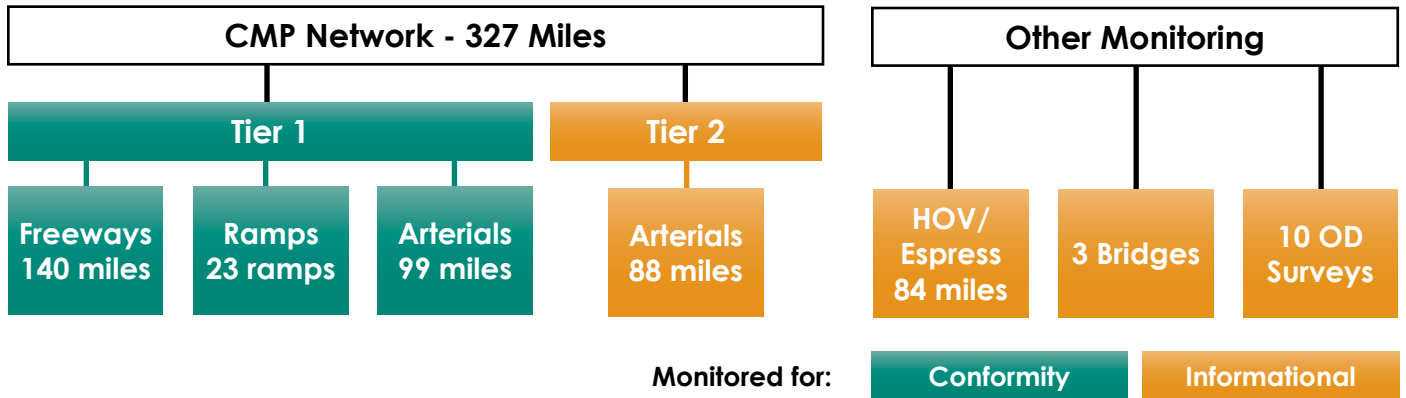


Figure ES-1: Alameda County CMP Network and Other Monitoring Elements

Measuring Congestion Levels: LOS Standards



Monitoring is undertaken by measuring the average speed of traffic over a specific length of roadway. The speeds are calculated from travel time data that is typically obtained from floating car surveys from the field. However, starting in the 2014 monitoring cycle, commercially available speed information is also used for monitoring a large portion of the CMP network. This commercial speed data is obtained through INRIX for the current monitoring cycle.

Based on the average speed, LOS is assigned to each roadway segment using adopted standards based on HCM. This LOS extends from LOS A (best) to LOS F (worst). The LOS category gives information about the quality of service to drivers. LOS A represents the best travel conditions from the driver's perspective where roadways are almost free flow and LOS F represents congested or stop-and-go conditions.

CMP Conformance

There are special requirements for Tier 1 roadways that perform at LOS F in the afternoon. This would trigger CMP conformance requirements, where the respective local jurisdiction would be required to prepare a deficiency plan to improve the performance of the segment. The deficiency plan will include details on the cause of the deficiency, measures to improve the performance of the roadway, and a funding plan for the proposed improvements. There are statutory exemptions that would exempt some of the congested roadways from deficiency planning, including if the roadway segment was already deficient in the base monitoring year (called "grandfathered") or construction work was active during the monitoring period.

Applying New Data Collection Technology: Commercial Speed Data

Keeping pace with technology, starting in the 2014 monitoring cycle, Alameda CTC began using commercial speed data in addition to the traditional floating car surveys for LOS monitoring purposes. Use of commercial speed data was approved by the Commission in 2013 based on a validation exercise carried out by Alameda CTC. As a part of that exercise, it was determined that commercial speed data could be used for freeways (Tier 1), ramps (Tier 1) and part of the arterials (Tier 2) where commercial speed data is available.

All other CMP roadways, including arterials (Tier 1) and a portion of arterials (Tier 2) were monitored using floating car surveys, similar to the previous monitoring cycles. Further, HOV lanes, where commercial speed data is not reported on these lanes separately, two freeways (Tier 1), two ramps (Tier 1) and 25 miles of arterials (Tier 2) that had inadequate coverage of commercial speed data were also monitored using floating car surveys.

Countywide Results

2014 monitoring results reported that average speeds on the CMP network declined from 2012, continuing the trend observed since 2010 as in the previous 2012 monitoring cycle. The speed reduction on freeways and arterials in 2014 ranged between 0.9 mph and 1.7 mph (**Figure ES-2**). This is likely due to the improving economy combined with the impact of construction activities. However, there were two notable locations showing improvements due to completion of improvement projects, namely Caldecott Tunnel 4th bore and Hayward Loop.

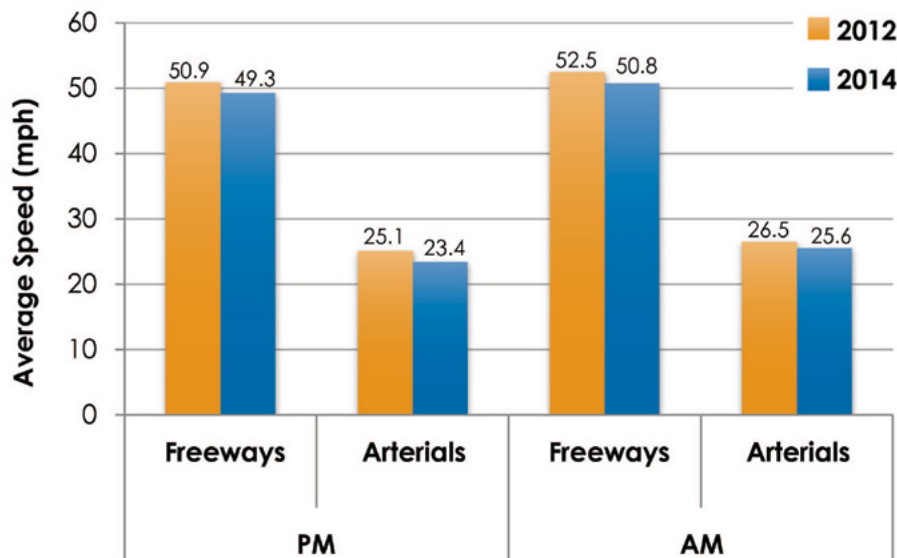


Figure ES-2: Average Speeds on CMP Network – 2012 vs 2014

Two-thirds of the CMP network was monitored using commercial speed data for the first time in 2014.

Prior monitoring studies used floating car surveys for monitoring the entire CMP network.

In 2014, the number of congested segments operating at LOS F slightly increased from 42 to 45 in the afternoon peak. Similar trends were noticed in the morning peak, where the LOS F segments increased from 28 to 32. **Figure ES-3** shows a map of the location of all the LOS F segments both in the afternoon and morning peak periods and active construction.

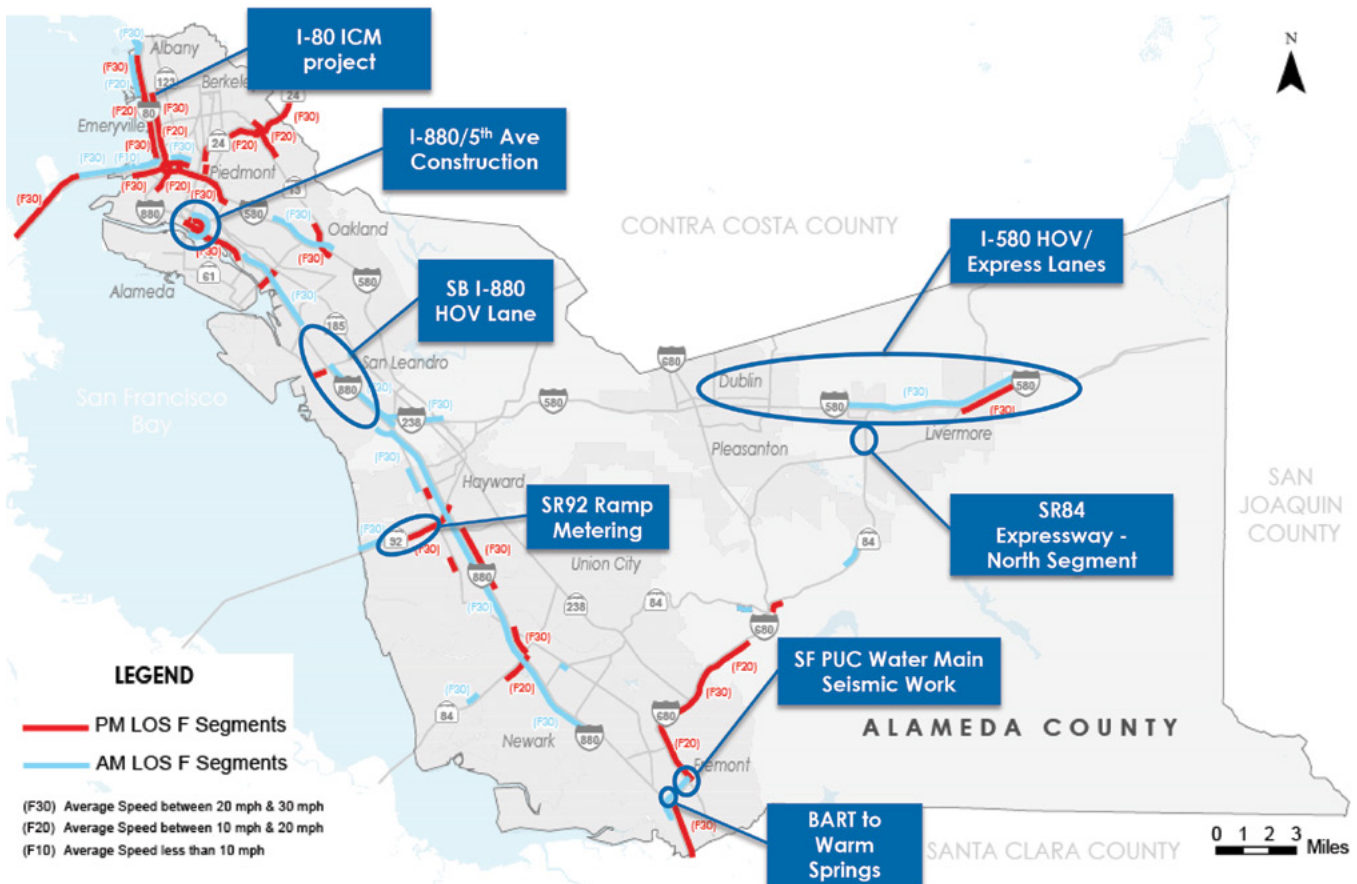


Figure ES-3: 2014 LOS Monitoring: Congested Segments Morning and Afternoon Peak Periods

After applying applicable statutory exemptions (including interregional trips on the segments that performed at LOS F during the 2014 LOS Monitoring in the afternoon peak period), no new deficiency has been identified.

Trends

Alameda CTC has been monitoring the performance of the CMP road network since 1991. Recently, there has been a noticeable increase in congestion on the network and overall performance influenced by the economic conditions in the Bay Area and the nation as a whole. Overall, average speeds on the CMP network almost returned to pre-recession speeds in 2014, after peaking in 2010 during the economic recession. **Figure ES-4a** shows the average CMP network

speeds on freeways and arterials between 2006 and 2014. Considering the large extent of network being monitored, the slight increase in average network speed represents a significant improvement in network performance for both freeways and arterials.

Employment data for the Bay Area region shows that Alameda County lags behind the other neighboring counties (Santa Clara, San Mateo and San Francisco) in employment recovery (**Figure ES-4b**). Therefore, Alameda County being in the geographic center of the region, the regional commute corridors connecting to the adjacent counties are generally experiencing more increased traffic than the roads serving internal trips in Alameda.

Average freeways and arterials speeds show a close correlation to employment. Employment decreased around 2010 and therefore less workers commuted during the peak periods, resulting in improved speeds across the roadway network. As employment recovered after 2012, CMP roadway speeds declined. Though the employment rates increased in 2013, they were still not as high as pre-recession years.

2014 monitoring generally reported increased congestion on the CMP network with declined network average speeds and increased number of congested segments.

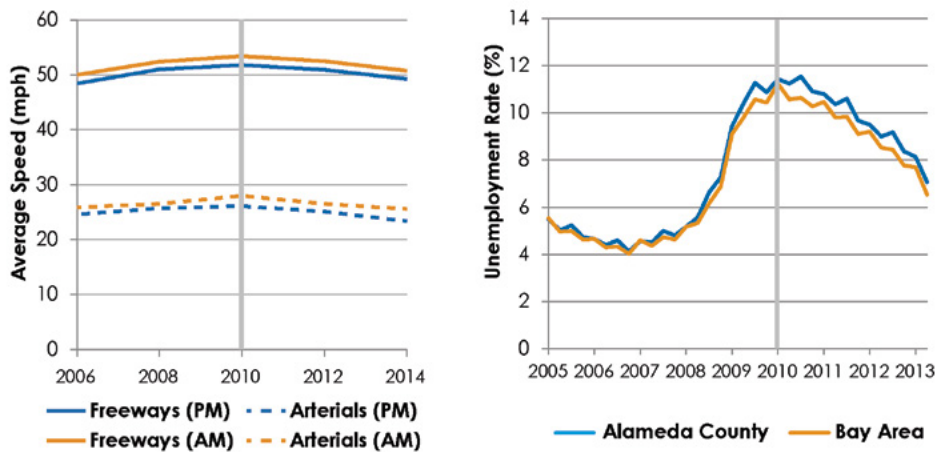


Figure ES-4: a) CMP Network Speeds and b) Unemployment Rates (Source: Bureau of Labor Statistics)

Similar trends have been observed in ridership on the major regional transit system. As shown in **Figure ES-5**, in 2010 at the peak of unemployment, BART ridership was low and the demand on freeways had reduced showing increased average speeds. Through the economic recovery in 2012 and 2014, the demand on both of these transportation services has increased again, showing increased ridership on BART and decline in average speeds on the CMP network.

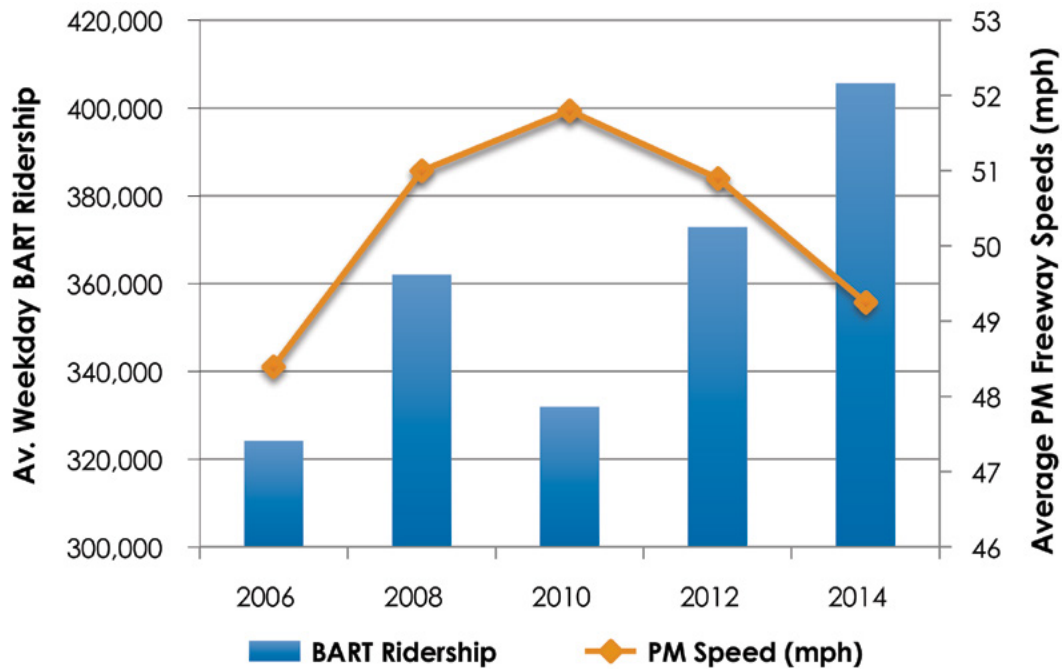


Figure ES-5: Afternoon Peak Period Average Freeway Speed and BART Ridership (Source: BART)

Planned and Potential Transportation Improvements

In 2014, one of the major impacts on road network performance was from the presence of construction and maintenance activities, particularly on major corridors. Major construction work was present on I-80 (also underway in 2012), I-580 in East County and I-880 in North and Central County. On the arterial network, State Route 112 (Davis Street) was under construction. **Figure ES-3** highlights the location of active construction work in 2014 that occurred in the vicinity of any CMP segments. The next LOS monitoring effort in 2016 will likely show improved performance resulting from these completed upgrades. Beyond the above projects currently under construction, potential improvements identified to be in various stages of plan/project development were grouped as follows:

1. Projects with approval that have already been **programmed** for construction. For example, State Route 84 widening project starting in 2015;
2. Projects in the **development or planning** phases. For example, the express lane project on I-680 northbound that is currently in the Environmental Phase; and
3. County-wide **planning study** efforts. For example, Goods Movements Plan, Transit Plan and Multi-Modal Arterial Plan that will study the county transportation needs and identify potential improvement measures.

Additionally, the 2014 Transportation Expenditure Plan, which is an \$8 billion, 30-year plan appearing before voters as Measure BB during the November 2014 ballot, if passed, is expected to improve the county-wide transportation system in all aspects.

Every two years, the Alameda County Transportation Commission (Alameda CTC) performs level of service (LOS) monitoring on its Congestion Management Program (CMP) network as required by state law. This monitoring gives Alameda CTC a better understanding of how the county's key roadways perform and informs transportation decisions for the upcoming fiscal years.

The objectives of this monitoring effort are to:

- Determine the **average travel speeds** and existing LOS throughout Alameda County;
- Identify the **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 and includes a number of appendices with supportive information. **Section 1**, the Introduction, provides a context for undertaking this LOS monitoring study. **Section 2** summarizes the methodology used to collect travel time data and the days of collection. **Sections 3, 4, 5** and **6** present the LOS monitoring results for the Tier 1/Tier 2 network, HOV/express lanes, bridges and OD surveys, respectively. **Section 7** presents a comparison of the results and additional insight on the trends. Lastly, **Section 8** provides conclusions, future improvements and recommendations for next steps. The **Appendices** contains maps and tables of the results, and additional details on the survey methodology.

1.1 | The CMP Network

The Alameda County CMP network is divided into two tiers. Tier 1 roadways are part of the CMP network initially adopted in 1991 and updated in 1992. As part of the LOS Monitoring Program, Tier 1 roadways are monitored for CMP conformity during the afternoon peak period and for information only during the morning peak period. Tier 2 roadways were added during an update to the CMP network in 2011. Tier 2 roadways are monitored for informational purposes only.

The entire CMP network consists of approximately 327 miles of roadways. Of this, Tier 1 roadways comprise approximately 239 miles and include all freeways, all state highways, principal and major arterials, as well as 23 ramp connections. Tier 2 roadways make up the remaining 88 miles of the network and include other major arterials and rural roadways. **Table 1-1** summarizes the distances monitored for each roadway type during the most recent CMP LOS monitoring in 2014. **Table 1-2** and **Table 1-3** provide a full list of routes for Tier 1 and Tier 2 summarized by jurisdiction. **Figure 1-1** shows a map of the CMP Network.



Table 1-1: Alameda CTC CMP Network

CMP Network Category	Distance Monitored
Freeways (Tier 1)	140 miles ⁴
Ramps and Special Segments (Tier 1)	23 connections
Arterials (Tier 1) ¹	99 miles ⁴
Arterials (Tier 2)	88 miles ⁴
HOV/Express Lanes	84 miles (each direction included separately)
Bridges ²	10 miles
OD Surveys ³	10 routes

¹ Includes 71 miles of conventional state highways.

² A section of bridges outside Alameda County are grouped under this category. The freeways category (Tier 1) contains Alameda County portions.

³ Includes nine auto, nine transit, one high occupancy vehicle (HOV), and one bike survey.

⁴ As measured in 2014 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 traffic levels on 10 high occupancy vehicle (HOV)/express lane routes covering 84 miles of freeway and compares their performance to the freeway general purpose lanes. For this comparison, each direction of the HOV/express route is considered separately as the end points are often different. Further, Alameda CTC also monitors congestion levels on three bridge crossings that connect Alameda County to San Francisco and San Mateo counties. These bridges are monitored for informational purposes to understand travel from and through Alameda County to the peninsula and San Francisco.

Lastly, Alameda CTC conducts travel time surveys between selected origin and destination (OD) pairs for auto, transit, HOV, and bicycle trips. The purpose of the OD surveys is to evaluate the comparative performance of various transportation modes between major employment centers and residential areas across the county. These surveys provide insight into the journey-to-work travel times.



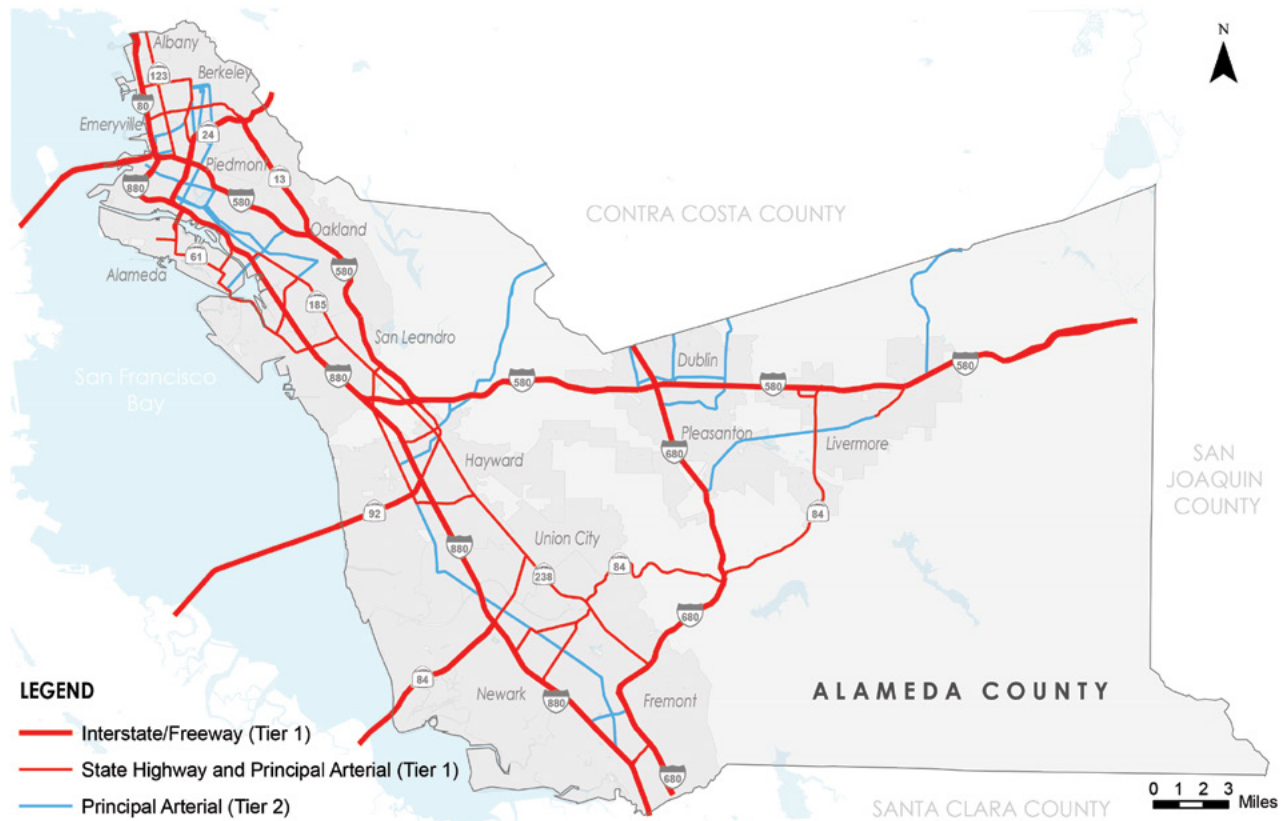


Figure 1-1: Alameda County CMP Network

1.1.1 | CMP Network Update

During each CMP update, the CMP network will be reviewed for any potential update including expansion of the network. In addition, each LOS monitoring cycle identifies any change in CMP road network, due to construction. These changes are incorporated into the CMP network and in the subsequent updates. For example, in 2014 some streets have been converted to one-way streets, causing the reverse route to either shorten or get eliminated. As a further example, the Caldecott Tunnel 4th bore completion resulted in permanent and additional lanes on SR 24 from Contra Costa County. **Appendix C** details all such road network changes and the additions to the monitoring effort this year such as the freeway HOV routes.

In addition to the physical changes to the CMP network, other minor adjustments were made in 2014 to the reported length of some CMP segments to align with updated Geographic Information System (GIS) maps to ensure consistency between the reported segment limits from historical monitoring efforts and the length reported by the GIS tool. Any segment with a notable change in reported length from 2012 is highlighted in the results tables presented in **Appendix B**.

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

Jurisdiction	Freeway	Miles	Other State Highways	Miles	Other Arterials	Miles
Albany	I-80 I-580	1.11 0.8	Sate Rte. (SR) 123 (San Pablo Ave.)	1.2	None	-
Berkely	I-80	2.4	SR 123 (San Pablo Ave.) SR 13 (Ashby/Tunnel Rd.)	2.3 3.5	University Ave. Shattuck Ave., Adeline	2.1 1.8
Emeryville	I-80	1.2	SR 123 (San Pablo Ave.)	0.5	None	-
Oakland	I-80 I-880 I-980 I-580 SR 24 SR 13	3.3 11.3 2.5 11.7 4.6 5.9	SR 123 (San Pablo Ave.) SR 13 (Tunnel Rd.) SR 61/260 (Tubes) SR 61 (Doolittle Dr.) SR 77 (42 nd Ave.) SR 185 (E 14 th St.)	1.3 0.4 0.6 2.3 0.4 4.0	MLK Jr. Blvd. Hegenberger Rd. 29 th Ave./23 rd Ave. See Park St.- Alameda	1.4 2.5 0.5
Piedmont	None	-	None	-	None	-
Alameda	None	-	SR 61 (Doolittle Dr., Otis, Broadway, Central, Envinal Ave.) SR 260 (Tubes)	3.9 0.8	Webster St. Atlantic Ave. Park St.	0.6 0.8 0.9
San Leandro	I-80 I-880 I-980	3.3 11.3 2.5	SR 61 (Doolittle Dr.) SR 61 /112 (Davis St.) SR 185 (E. 14 th St.)	0.9 1.8 3.2	150th Ave. Hesperian Ave.	0.5 1.0
Hayward	I-180 SR 92	4.5 6.7	SR 185 (Mission Blvd.) SR 238 (Mission Blvd.) SR 238 (Foothill Blvd.) SR 92 (Jackson St.)	0.6 4.8 1.2 1.7	A St. Hesperian Blvd. Tennyson Rd.	1.5 2.7 2.4
Union City	I-880	1.9	SR 238 (Mission Blvd.)	3.1	Decoto Rd.	1.8
Fremont	I-680 I-880 SR 84	7.5 11.7 3.8	SR 238 (Mission Blvd.) SR 262 (Mission Blvd.) SR 84 (Thornton, Fremont, Peralta, Mowry Ave.)	4.8 1.6 10.7	Decoto Rd. Mowry Ave.	1.2 2.8
Newark	SR 84	2.4	None	-	None	-
Pleasanton	I-580 I-680	7.6 3.6	None	-	None	-
Livermore	I-580	5.6	SR 84	5.1	1 st St. Airway Blvd. (old SR 84)	1.7
Dublin	I-680	1.9	None	-	None	-
Unincorporated Areas	I-680 I-580 I-238 I-880	8.4 19.4 2.1 2.0	SR 84 (Vallecitos Rd.) SR 185 (Mission Blvd. & E. 14 th St.) SR 238 (Foothill Blvd.)	6.1 2.4 0.8	Hesperian Blvd.	2.0
Totals		139.7 mi		69.7 mi		28.9 mi

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

Jurisdiction	Arterials	Miles	Arterials	Miles
Alameda County	A St.* Crow Canyon Rd. Sunol Blvd.- 1 st St.- Stanley Blvd.*	0.6 7.1 2.8	Grove Way Tassajara Rd.	0.9 0.5
Alameda	High St.	1.1	Telegraph Ave.*	1.1
Berkeley	Bancroft/Durant Ave. College Ave.*	0.7 1.2	Powell St. - Stanford Ave. Shattuck Ave.*	0.1 0.7
Dublin	Dougherty Rd. Dublin Blvd.	1.9 3.6	San Ramon Rd. Tassajara Rd.	1.6 2.2
Emeryville	40th St. - Shellmound Ave.	1.4	Powell St.. - Stanford Ave.	0.6
Fremont	Automall Pkwy. Fremont Blvd.	-	SR 61 (Doolittle Dr., Otis, Broadway, Central, Envinal Ave.)	1.2
Hayward	A St.* Hesperian Blvd.- Union City Blvd.*	1.6 8.6	Alvarado Blvd.	2.2
Livermore	E. Stanley Blvd.- Railroad Ave.- 1st St.	2.4	Vasco Rd.	6.5
Oakland	12 th St.-Lakeshore Ave. 51 st St. Broadway College Ave.* E. 15 th St. Foothill Blvd. High St.	2.4 0.8 3.7 1.0 1.0 5.4 2.4	International Blvd. Powell St. - Stanford Ave. Shattuck Ave.* Telegraph Ave.* W. Grand Ave. to Grand Ave. 73 rd Ave.	2.9 0.8 0.8 1.1 3.1 1.1
Pleasanton	Santa Rita Rd. Stoneridge Dr.	1.2 2.5	Sunol Blvd.-1st St. - Stanley Blvd.*	2.9
Union City	Alvarado Blvd.	1.0	Hesperian Blvd. - Union City Blvd.*	1.3
Totals				88.2 mi

* Denotes that roadway traverses more than one jurisdiction.

1.1.2 | Division of CMP Network

For LOS monitoring purposes, the entire CMP network is divided into shorter 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, where land use changes occurred over the years impact the traffic pattern significantly, Alameda CTC reviews the segment limits and, if needed, develop appropriate shorter segments. The I-580 corridor in the east county was segmented in 2007 to develop short segments using this approach. 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 the 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 Highway Capacity Manual (HCM).

1.2 | LOS Standards and CMP Conformity

Alameda CTC performs LOS monitoring by measuring the average speed of traffic as vehicles travel a length of roadway on the CMP network. The average speed is then classified from LOS A (best) to LOS F (worst). LOS A represents the best travel conditions from the driver's perspective 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 representing deteriorated traffic flows in the afternoon peak are further analyzed under special requirements (CMP conformity). Based on the analysis, if the roadway is identified to be deficient, the respective local jurisdiction will be required to prepare a deficiency plan that details the cause of the deficiency, identify 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 and is therefore "grandfathered" in at LOS F;
- It is located within an Infill Opportunity Zone (IOZ);
- It is under construction;
- 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 1-4**, only the Tier 1 CMP network in the afternoon peak periods is subject to LOS conformance and associated deficiency planning (where applicable). Additional data monitored or collected is used for information purposes only.

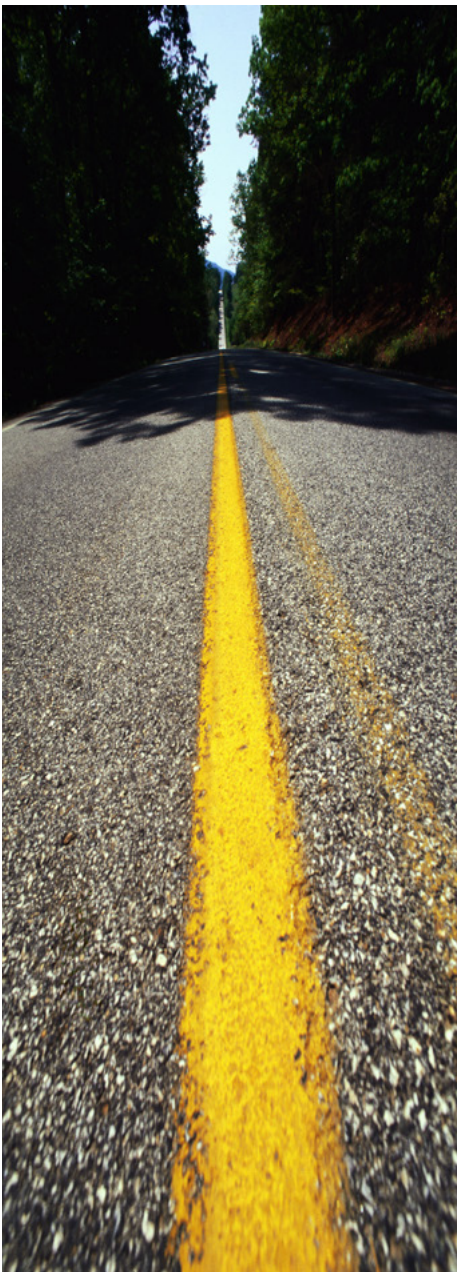


Table 1-4: CMP Network Monitoring Periods and Purpose of Monitoring

Tier	Time Period	CMP Category	Purpose
Tier 1	PM	Freeways	Conformity
		Arterials	
		Ramps & Special Segments	
	AM	Freeways	Informational
		Arterials	
		Ramps & Special Segments	
Weekends	Freeways		
Tier 2	All	Arterials	
Other	All	HOV & Express Lanes	
		Bridges	
		OD Surveys	

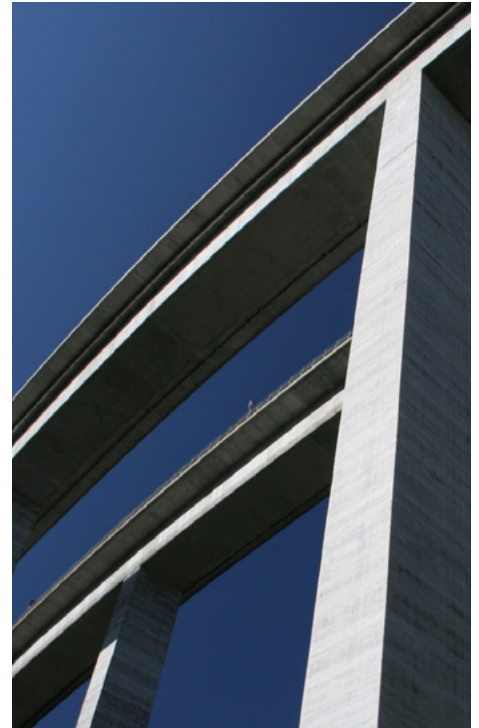
1.3 | What's new in this Monitoring Cycle?

Historically, Alameda CTC has adopted a floating car methodology to collect travel time information. New to this monitoring cycle is the use of commercial speed data in addition to floating car surveys. In 2013, Alameda CTC undertook an extensive validation exercise to confirm that commercial speed data was equally acceptable as floating car surveys. Based on the results of the validation, commercial data was used for monitoring two-thirds of the CMP network during the current cycle. The use of this data provides a cost effective approach and allows increased analysis opportunities at an incremental cost.

The cost savings achieved through the use of this commercial data allowed for an expansion to the monitored network through the following additions:

- Countywide HOV/express lanes (using floating car surveys as HOV specific commercial speed data was not yet available) (**Figure 1-2**); and
- LOS monitoring of three bridges between Alameda County and the Peninsula/San Francisco (using commercial speed data) (**Figure 1-2**).

Also, new to this monitoring cycle is LOS assignment to Tier 2 CMP network. In the previous 2012 monitoring cycle, Tier 2 network was monitored but LOS was not assigned as arterial class was not developed. During the 2014 monitoring cycle, a free flow speed study was conducted on Tier 2 network using a combination of floating car and commercial data and appropriate classification was assigned to each Tier 2 CMP segment. Based on this classification, LOS was calculated for 2012 and 2014. Refer to **Section 8.4** for recommendations on potential improvements in the future monitoring cycles.



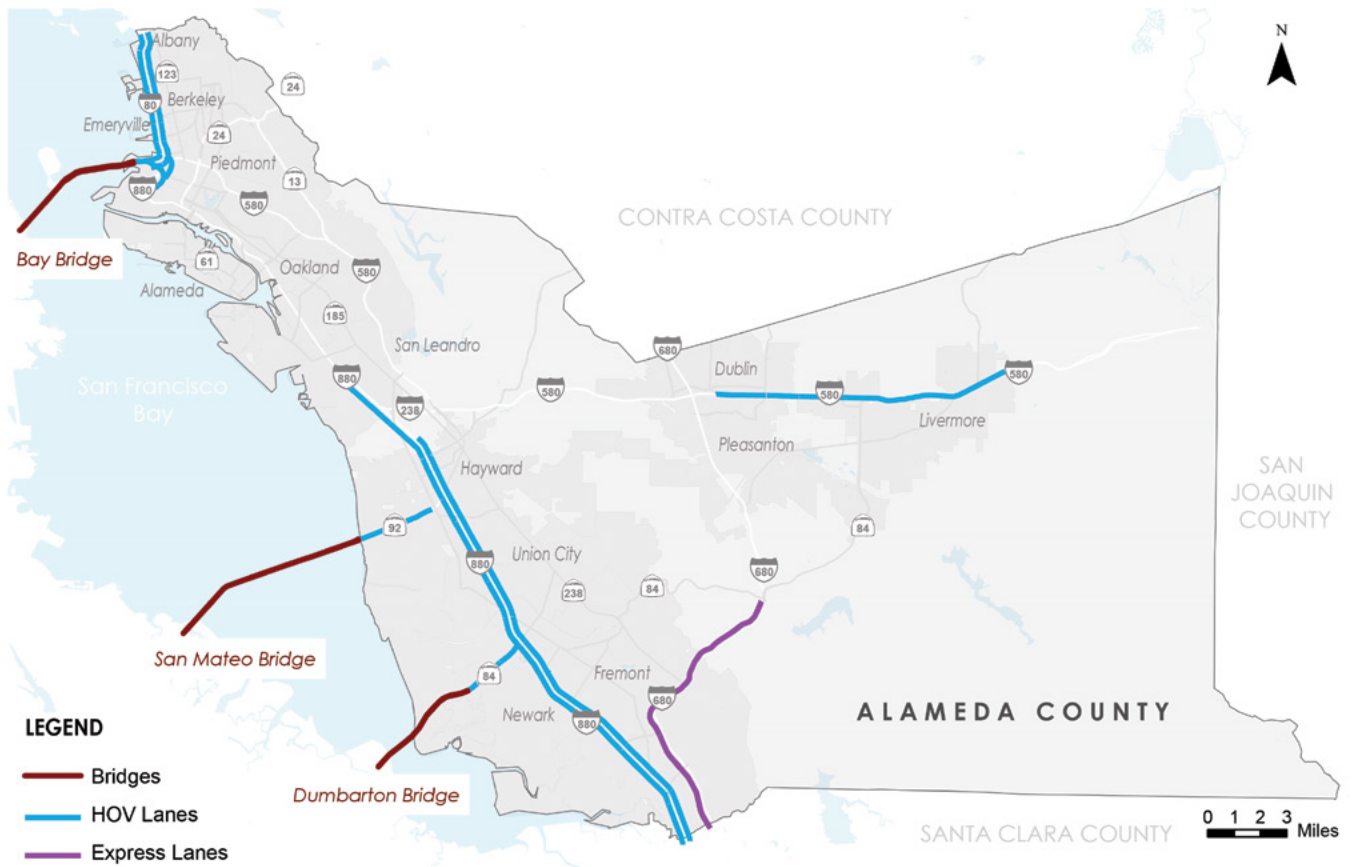


Figure 1-2: HOV/Express Lanes and Bridges added to 2014 LOS Monitoring

This section discusses the three-step methodology followed for measuring LOS during the current monitoring cycle. In the first step, Alameda CTC screened days within the monitoring period to ensure that only days that were expected to result in normal commuter traffic conditions were retained. 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 for later removal.

The second step consisted of the actual data collection using either commercial speed data or floating car surveys. Data was collected for the Tier 1/Tier 2 CMP network, HOV/express lanes, bridges, OD surveys, and free flow speed surveys on arterials (Tier 2). In the final step, data was analyzed separately for commercial speed data and floating car surveys to obtain the average speed and converted to LOS using HCM methodologies.

2.1 | Screening for Data Collection Periods

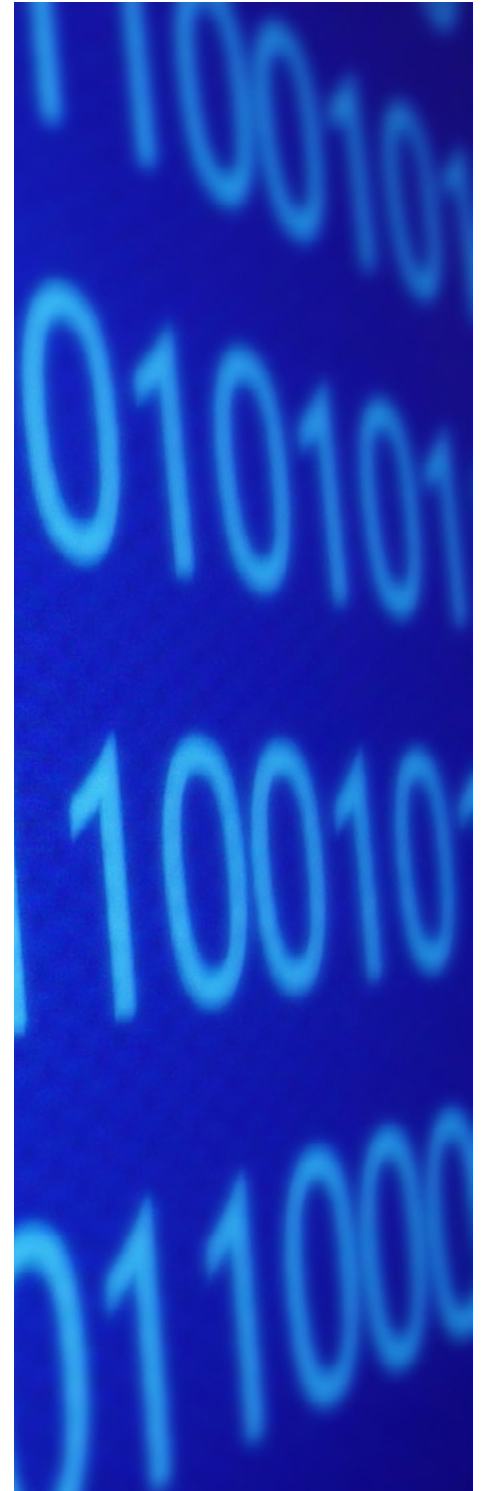
As a preliminary step in the analysis, it was necessary to identify all the days and time periods during which the CMP network could be monitored. Since travel time data for 2014 was collected using a combination of commercial speed data and in-field floating car surveys, monitoring days for both data sources were reviewed and identified separately.

As a part of the preliminary analysis, all potential factors that may affect the monitoring effort were carefully examined. This included identifying school holidays across the county and any events that occurred during the monitoring period. Analyzing these additional factors was necessary to identify good quality data for the current monitoring. This in turn ensured that the LOS results are representative of normal traffic conditions experienced by a daily commuter.

2.1.1 | Base Monitoring Times

Data for the LOS Monitoring is typically collected in spring when the schools are in session. Commercial speed data collection and floating car surveys were conducted in the months of March, April and May 2014 when schools were in session. When additional floating car surveys were required, some data collection efforts extended into the first week of June, but were completed before the schools closed for summer.

Weekday data was collected on Tuesdays, Wednesdays and Thursdays for the nominated morning and afternoon peak periods. The morning peak period was



Mar 2014

SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	[Public Holiday]				

Caesar Chavez Day

Apr 2014

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26

Easter

May 2014

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Memorial Day

Jun 2014

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7

- One or more school districts on Spring Break
- Weeks of public holidays
- A PM surveys not undertaken around Oracle Arena during sporting events

Figure 2-1: 2013 Public Holidays & Spring Break Periods in Alameda County

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 39 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 AM to 3:00 PM, which were verified to be the weekend peak period.

2.1.2 | Public Holidays and Spring Breaks

Weeks containing public holidays and school spring break periods were expected to produce non-representative traffic patterns. The associated data were therefore removed from the commercial speed datasets. **Figure 2-1** shows public holidays and spring break periods.

Spring break of Alameda County schools varied by the school district and occurred as early as March 24th and ended as late as April 25th. 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 are expected to serve more inter-county and interregional traffic.

2.1.3 | Special Events

Special events in Alameda County were reviewed to see if they occurred during or near the specified weekday monitoring times. Traffic data associated with such events was removed from monitoring due to expected irregularities.

While there were some significant regional events, the majority of the events did not occur within the monitoring period. Events in Oracle Arena, such as Warrior Basketball games and Oakland A's Baseball games, were the notable exception (**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 data was also monitored as a part of the analysis, however, no events were observed to impact traffic conditions.

2.1.5 | Construction and Maintenance

Announcements were reviewed to identify significant construction impacts during the monitoring period. Sources of data included the following (**Figure 2-2**):

- Alameda CTC projects page;
- Other government websites (including Caltrans District 4);
- Specific construction project websites (including the new San Francisco-Oakland Bay Bridge);
- Facebook and Twitter feeds (including the I-880 Corridor Improvement Project); and
- Caltrans Performance Measurement System (PeMS) lane closure database.

Further, cities and the county were requested to share their construction and maintenance schedules.



Figure 2-2: Sources of Information about Construction Activities and Lane Closures

Both long and short term construction activities were identified. As an example of a long term construction activity, I-80 eastbound along the San Francisco-Oakland Bay Bridge experienced ongoing construction work for the majority of the monitoring period in the morning peak, including a regular closure of one travel lane. 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 2-1** lists segments impacted by ongoing long term construction.

Short term construction activities were reviewed and evaluated separately. For example, the I-880 Marina Boulevard on-ramp was closed from April 8th at 10 PM to April 11th at 5 AM. The days impacted by construction were removed from the monitoring data set for the adjacent freeway CMP segment as the presence of construction may impact 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.

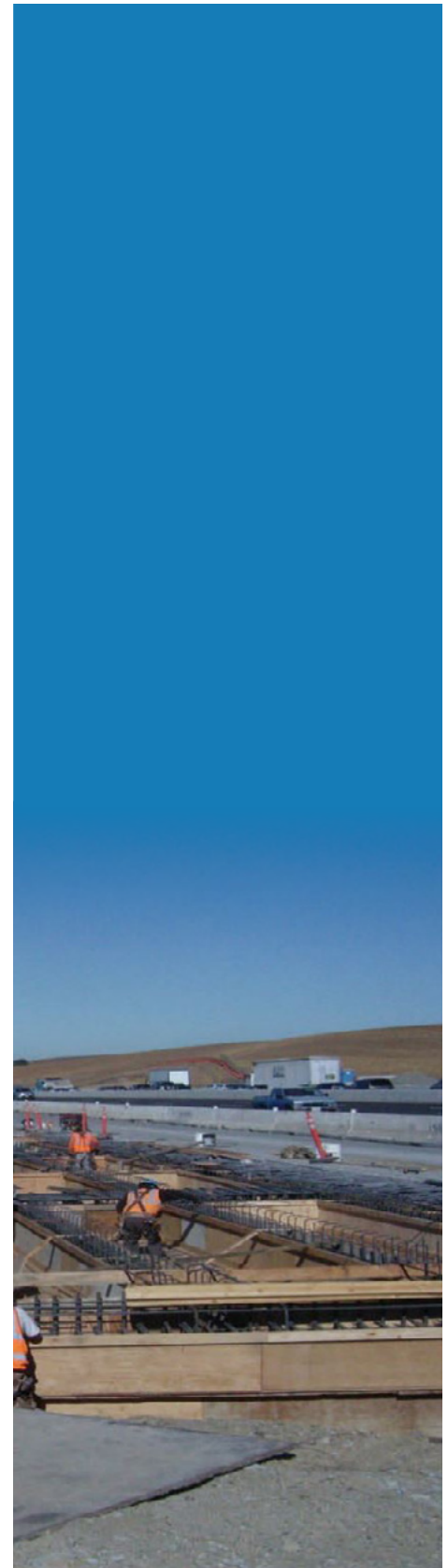


Table 2-1: Monitoring of HOV/Express Lanes and Bridges added to 2014 LOS Monitoring

Tier	Impacted Roads	Extents	Description of Work
Freeway (Tier 1)/ HOV	I-580 in East County	Between Isabel Ave. & Greenville Rd.	HOV/express lanes
Freeway (Tier 1)/ HOV	I-80	Between San Francisco-Oakland Bay Bridge Toll Plaza to Contra Costa county border	Integrated Corridor Management Project
Freeway (Tier 1)/ HOV	I-880 in South County	At SR 262 Interchange	Interchange reconstruction and new BART connection
Freeway (Tier 1)/ HOV	I-880 in North County	Near 5 th Ave. in Oakland	Major Freeway work
Freeway (Tier 1)/ HOV	I-880 in Central County	Hegenberger to Marina	Southbound HOV lane
Freeway (Tier 1)	I-80 SFOBB EB (AM)	Bay Bridge (West span)	Long term maintenance works
Arterial (Tier 1)	SR 112 Davis St.	Between Doolittle Dr. and East 14 th St.	Overcrossing replacement at I-880
Arterial (Tier 1)	Mowry Blvd.	Between Parkside Dr. to Bonner Ave.	Pavement work
Arterial (Tier 2)	Dougherty Rd.	At Mariposa Cir.	Construction of new signal
Arterial (Tier 2)	Fremont Blvd .	Between Mowry Ave. to Central Ave.	Pavement work

Incident hotspots observed were on freeways connecting to the Bay Bridge and San Mateo Bridge.

2.1.6 | Incidents

Incidents are generally expected to impact traffic conditions, and therefore data associated with incidents has been 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 PeMS were reviewed and the speed data records for the corresponding time period were removed across all the relevant CMP segments. **Figure 2-3** shows a heat map of freeway incidents using data from Freeway Performance Monitoring System (PeMS). Locations with higher densities of incidents are shown in red.

The heat map qualitatively indicates incident hot spots. Two notable hot spots in the county are at the intersection of State Route 92/I-880 and at the intersection of I-80/I-880/I-580. These locations with high incident density reported around 100 to 130 incidents in the vicinity during the monitoring period. Locations with medium incident density, such as around the intersection of I-580/I-680, or along I-880 and I-580 in Oakland, reported around 60 to 70 incidents each during the monitoring period. Other locations with low incident densities, such as around the intersection of I-580 and Vasco Road in Livermore or along Bay Bridge, reported less than 15 incidents during the monitoring period.

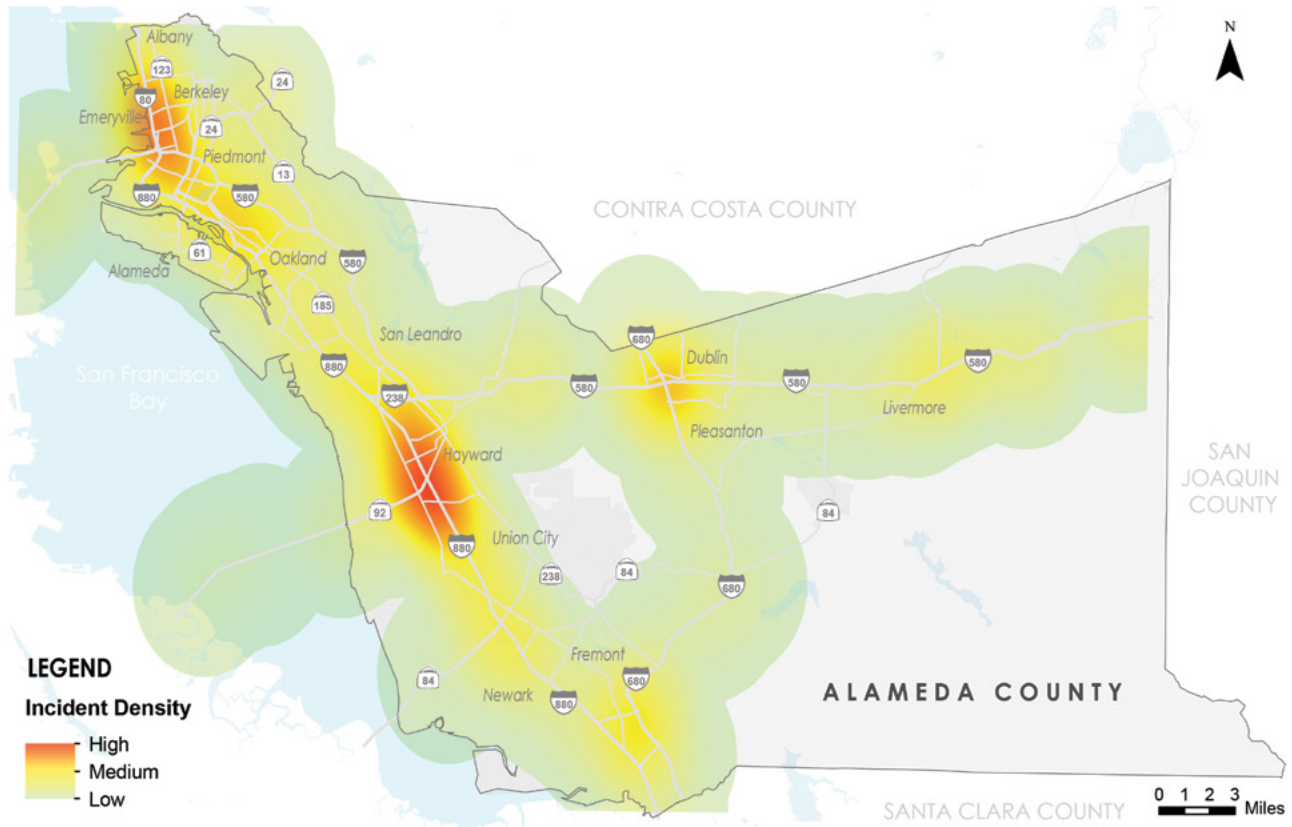


Figure 2-3: Incident Density Heat Map (Source: Freeway PeMS Incident Data)

2.2 | Data Collection

As stated earlier, this is the first time that Alameda CTC used both commercial speed data and floating car surveys to measure average speed and LOS. **Table 2-2** summarizes the source of travel time data for each category of CMP segment.

Table 2-2: Summary of Data Collection Methods

CMP Category Network	Miles/#	2012 Data Collection	2014 Data Collection
Freeways (Tier 1)	140 miles	Floating car surveys	Commercial data ¹
Ramp and Special Segments (Tier 1)	23 connections	Floating car surveys	Commercial data ¹
Arterials (Tier 1)	99 miles	Floating car surveys	Floating car surveys
Arterials (Tier 2)	87 miles	Floating car surveys	65 miles Commercial data 25 miles Floating car surveys
HOV/Express Lanes	84 miles	Not monitored	Floating car surveys
Bridges	10 miles	From Caltrans/MTC	Commercial data
OD Surveys	10 routes	Floating car, transit and bike surveys	Floating car, transit and bike surveys

¹ Data for two segments collected using floating car surveys



2.2.1 | Commercial Speed Data

In 2013, MTC contracted with INRIX to obtain region-wide commercial speed data, and has made the data available free of charge to Congestion Management Agencies (CMAs) and other local governments for planning and monitoring purposes. This LOS Monitoring Study used the commercial speed data from INRIX, Inc 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 that are termed 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 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 the identified TMCs in Alameda County. This resulted in a sample size of approximately 3,500 data points for the majority of CMP segments. **Appendix F** provides technical details about this data collection.

2.2.2 | Floating Car Survey Data

Where the coverage of commercial speed data was not adequate or results were not expected to be reliable, 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. Six surveys were completed on the arterials (Tier 1/Tier 2) and HOV/express lanes. If congested segments (LOS F) were experienced in the afternoon and the route was subject to CMP conformity, then two additional runs were generally completed on the entire route. Data was coordinated with the local jurisdiction for two routes in Central County. **Appendix G** provides additional technical details on the floating car data collection effort.

2.2.3 | OD Surveys

Ten origin-destination pairs that reflect typical commute trips in Alameda County (between major residential areas and employment centers) have been monitored by auto and transit, and in one case bicycle, for comparability of travel by auto and alternative modes (**Appendix E**).

² INRIX website: <http://inrix.com/trafficinformation.asp>

OD surveys were completed using:

- Floating car surveys for the auto and HOV component (4 runs);
- Transit passenger travel surveys for the transit component (2 runs); and
- Bike rider for the bicycle component (2 runs).

The OD routes were monitored either in the morning or afternoon peak depending on the peak direction of the route. Consistent with the general LOS monitoring procedure, Alameda CTC conducted surveys on Tuesdays, Wednesday and Thursdays during the monitoring period on two different days.

A number of surveyors traversed between the designated OD points, documenting their travel times. Transit trips were taken either on buses (AC Transit, UC Transit, VTA, or Wheels), rail (BART or ACE), or a combination of these modes. The bicycle trip was taken on local streets in Emeryville and Berkeley. Whenever necessary, the auto and transit trip started on the same day at the same time. These survey times included walking, waiting, parking and traveling times, as applicable.

2.2.4 | Free Flow Speed

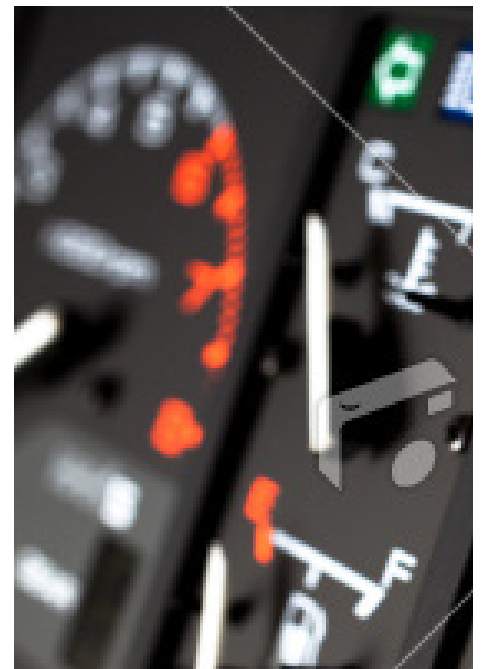
Arterials (Tier 2) were added to the CMP network in 2012. While speed data was collected and reported for these roadways, LOS was not estimated. To estimate the LOS, arterials needed to be classified based on free flow speed surveys.

Therefore, in 2014, Alameda CTC measured free flow speeds on the Tier 2 network using either floating car surveys or commercial speed data. The same data source that was used to determine LOS of a particular arterial (Tier 2), as noted in **Section 2.2** was also used to collect free flow speed.

The times for the free flow speed surveys were chosen to ensure that travel was less impeded by other vehicles and not influenced by excessive speeding behavior (which is sometimes observed during the night when enforcement may be perceived to be lower). Floating car surveys consisted of four runs during these off peak times, and commercial speed data was obtained between 6:00 AM to 6:30 AM, and 8:00 PM to 9:00 PM. **Appendix H** includes additional information on the free flow speed analysis and how the classifications were determined.

2.3 | Data Analysis

The methodology for deriving the 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. The methodology differs between the two data sources for the conversion process. In the second step, average speeds are converted to estimate LOS using a specific method depending on the type of roadway.



2.3.1 | Calculate Average Peak Period Speed

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

- Commercial Speed Data:** Once collected from the INRIX database, the commercial speed data points were associated to the appropriate CMP segment through a spatial mapping process. Next, data outside the monitoring period and data with poor data quality were removed. To calculate the average speed for all the data points, the data was averaged on each CMP segment for each time period. See additional technical details in **Appendix F**.
- Floating Car Survey Data:** Once the floating car survey data was collected using GPS units, it was processed to extract the average speed and travel time on each sub segment. It was then input into spreadsheets previously developed by Alameda CTC, which automatically calculate the average speed using the travel time and segment length for each CMP segment. **Appendix G** provides additional technical details.

2.3.2 | LOS Estimation

The next step in the analysis process was to assign LOS based on the average speeds calculated on each CMP segment. As adopted in the 2013 CMP, LOS is estimated for the entire CMP network based on HCM 1985 with the exception that arterial classified as Tier 2 will also be reported using HCM 2000 for comparison purposes. This study uses the LOS speed standards as shown in **Tables 2-3, 2-4** and **2-5**.

Table 2-3: Freeway LOS, 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 Sections⁴

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 on June 14, 2004 to show degrees of LOS F on congested roadways.

Table 2-4: Arterial LOS, 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 2-5: Arterial LOS, HCM 2000

Arterial 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)

Freeways

Based on the average speed of the freeway in the morning and afternoon peaks and using the HCM standards as shown in **Table 2-3**, LOS was estimated for each CMP segment in each time period. For example, the I-80 eastbound segment between Ashby and University had an average speed of 61.5 mph during the morning peak, which is LOS A based on the adopted standards.

Ramps and Special Segments

Based on the suggested guidelines from the HCM, LOS A is deemed to occur when vehicles are traveling at a free-flow speed for the given roadway conditions. LOS F is estimated to occur when speeds have dropped below 50%

of the free flow speeds. Levels of Service B to E are calculated at even intervals between free flow speeds and LOS F speeds. There is one ramp segment that is classified as a weaving segment and is therefore not assigned a LOS. The performance of this segment can be judged on its average speed.

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. For Tier 1, the classification was previously determined and was obtained from previous LOS monitoring reports. For Tier 2, the classification was determined for the first time in 2014 using the typical free flow speed of the road in light traffic conditions as described in **Section 2.2.4**.

Using the classification of the street and the average travel speed, and based on relevant HCM standards as shown in **Tables 2-4** and **2-5**, LOS for the arterial segment is determined for both HCM methodologies. For example, Broadway southbound (between Grand Avenue and 14th Street) had an average speed of 18.3 mph during the morning peak. It was classified as HCM 1985 Class III and therefore assigned a LOS C. Using HCM 2000, it was classified as Class IV and assigned a LOS C again.

Rural Roadways

A few of the 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 slow trucks in the traffic stream. One such Tier 1 roadway is State Route 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 is deemed to occur when vehicles are traveling near the free-flow speed for the given roadway conditions. LOS F is estimated to occur when speeds have dropped below 50% 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 **Table 8-1**, HCM 1985. Based on this methodology, LOS is calculated for rural roadways (both Tier 1 and Tier 2) for the current monitoring cycle.

HCM 2000 presents a different methodology for estimating LOS for rural roadways. Compared to the above methodology that estimates LOS, using observed speed with reference to the free flow speed, HCM 2000 has absolute speed cut off points that assume a single category of rural roadways (**Table 2-6**). When these

cut offs were applied to the 2014 arterial (Tier 2) data, it was apparent that the HCM 2000 methodology was not appropriate for lower speed rural roadways. For example, Vasco Road, with a speed limit of 45 mph could never achieve LOS A, B or C conditions without drivers exceeding the speed limit. Yet, in reality, this rural roadway would most certainly experience free flowing conditions (normally termed LOS A) during certain off peak times. Later versions of the HCM have been modified to accommodate this situation. They now include multiple categories of rural roadway to recognize both higher and lower speed limits. Since only 12% of these arterials are classified as rural roadways, the LOS calculation per HCM 2000 is not reported for rural roads in the current monitoring cycle. These methodologies may be considered in future versions of this LOS Monitoring Report.

Table 2-6: Rural Roadway LOS, HCM 2000

LOS	Average Travel Speed (mph)
A	> 55
B	> 50 - 55
C	> 45 - 50
D	> 40 - 45
E	≤ 40

Source: Exhibit 20-2, HCM 2000 (U.S. Customary Units)



3

Level of Service Results: Freeways & Arterials

2014 monitoring results reported a reduction in the average speed by 0.9 mph to 1.7 mph from 2012 on the Tier 1 network.

This section presents a summary of LOS results for the freeways, ramps and arterials (Tier 1 and Tier 2 CMP network). In general, the number of congested segments across the CMP network increased from 2012 to 2014. Additionally, the majority of major corridors showed a slight decline in speed in 2014. Significant improvements were observed on the freeway network in the Caldecott Tunnel and on the arterial network around the Hayward Loop. **Appendix A** and **B** provide detailed segment results.

3.1 | Average Speeds

2014 monitoring results reported a reduction in the average speed by 0.9 mph to 1.7 mph from 2012 on the Tier 1 network. This is likely caused by the improving economy combined with impact due to construction activities occurring across the county.

Figure 3-1 presents the countywide average of the freeway and arterial speeds by peak period between 2012 and 2014. The 2014 results demonstrate a continuation in the trend observed during the 2012 monitoring period.

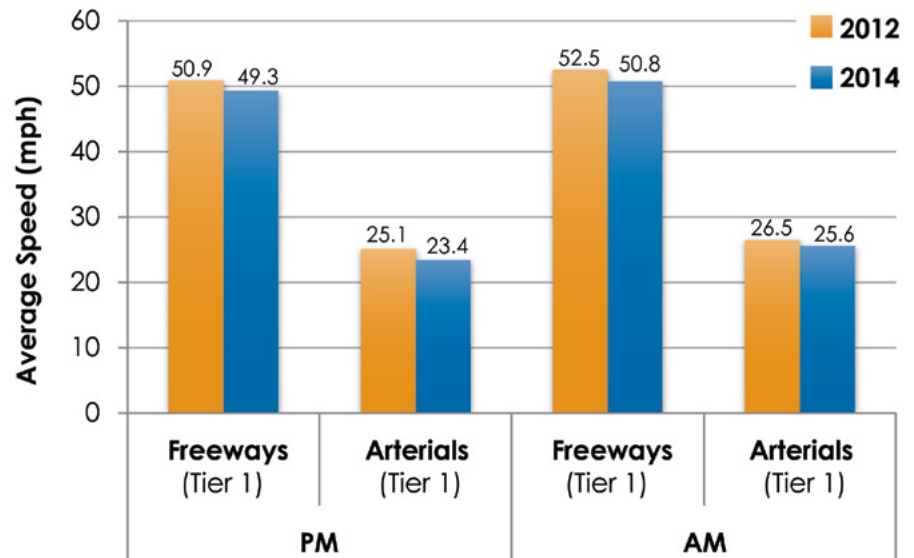


Figure 3-1: Average Speeds on CMP Network – 2012 vs 2014

The difference in performance of arterials (Tier 2) between 2012 and 2014 is not reported above, as the 2014 results are considered to be a baseline only. In 2014, Alameda CTC surveyed arterials on the Tier 2 network using commercial speed data. The 2013 validation study that compared the floating car and commercial speed data did not validate the commercial speed data well on arterials. Alameda CTC moved to use commercial speed data on these arterials since they are monitored for informational purposes only, and adopting this methodology significantly reduced cost.

Also, since monitoring this Tier 2 network began only from 2012, there is no historic data similar to Tier 1 network exist for tracking trend. Instead these 2014 results will serve as a baseline in future comparisons with other commercial speed data surveys.

3.2 | Overview of Congested (LOS F) Segments

Under the CMP legislation, any CMP segment performing at LOS F during the monitoring is potentially subject to CMP conformity requirements. For the Alameda CTC LOS Monitoring program, only LOS monitoring in the afternoon peak on the Tier 1 CMP network is subject to CMP conformity, or potential development of a deficiency plan. Alameda CTC labels LOS F segments as congested.

In 2014, the number of congested segments increased from 42 to 45 in the afternoon peak period. Similarly in the morning peak period, the number of congested segments increased from 28 to 32 (Figure 3-2). When compared to the afternoon peak, the morning peak had fewer congested segments in 2012 and 2014. Since the CMP segment lengths vary significantly, to better understand the extent of the network experiencing congestion, congested segments were also analyzed using their lengths. Of the total CMP network, 7.5% of the length was congested in the afternoon peak and 7.3% in the morning peak. Therefore, Alameda CTC observed similar lengths of congestion in both peaks. Figure 3-3 shows the proportion of the network length containing uncongested and congested segments.

Further, these figures show that the freeway network experiences a significant proportion of the congested segments even though the combined arterial network (Tier 1 and Tier 2) is longer. This further demonstrates the nature of the transportation network in terms of freeways supporting regional and local traffic and arterials supporting more local traffic.

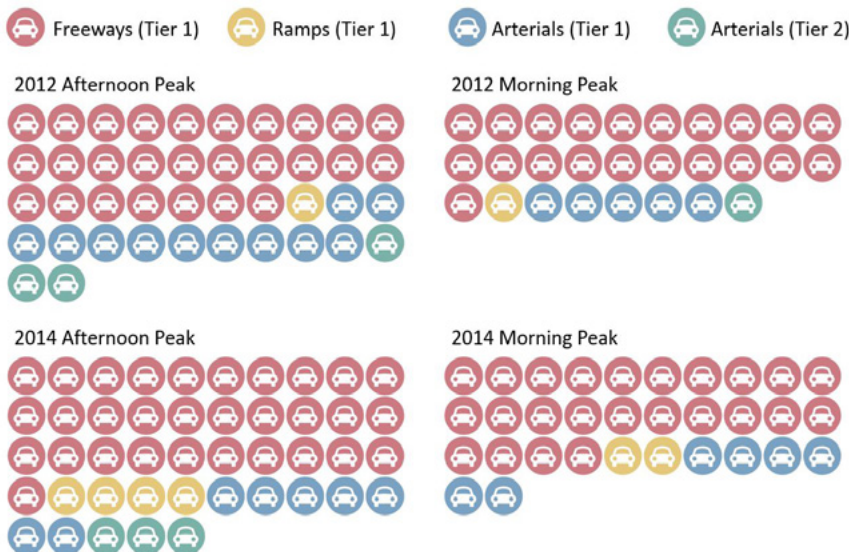


Figure 3-2: Number of Congested Segments in 2012 and 2014

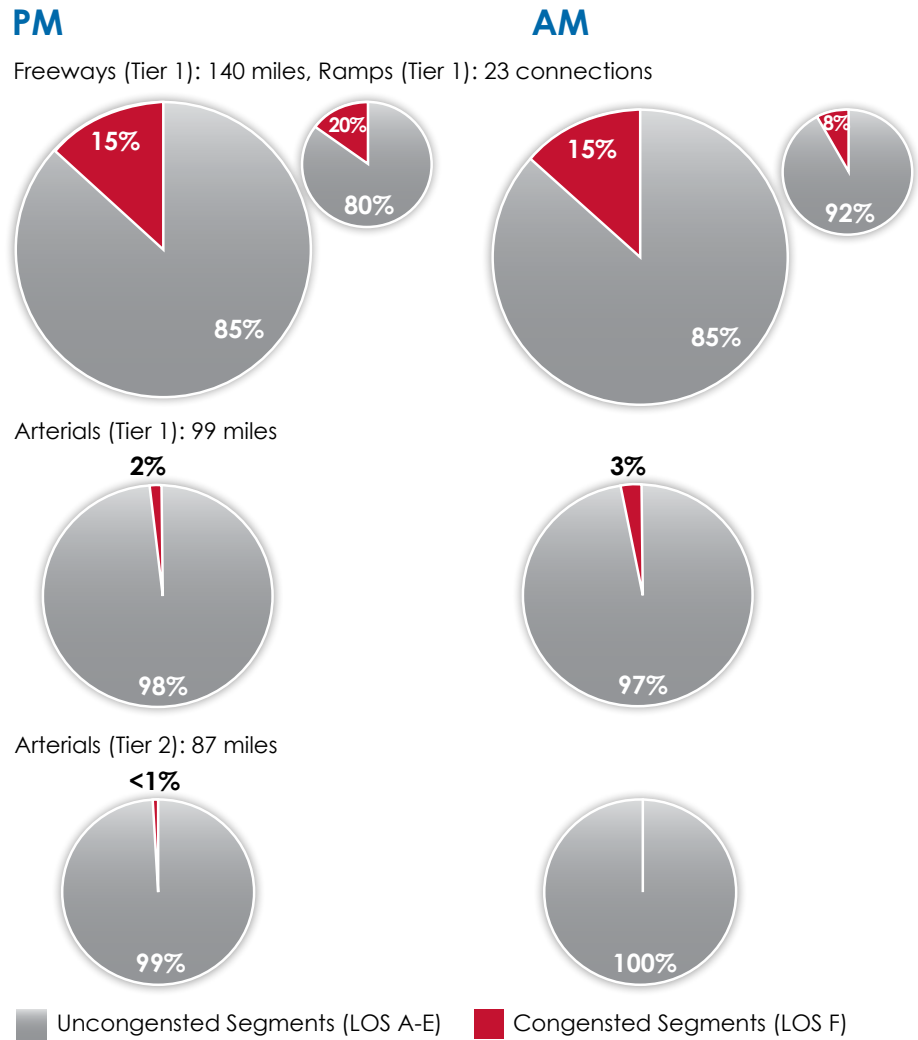


Figure 3-3: Length of Congested Segments for 2014 (in miles)

3.3 | Countywide Network Performance

Figures 3-4 and 3-5 compare the location of congested segments between 2012 and 2014 on the Tier 1 and Tier 2 networks. They highlight the congested segments (LOS F) in:

- Both monitoring cycles;
- 2012 only, but performance improved in 2014; and
- 2014 only, indicating performance declined in 2014.

There were notable improvements from 2012 congested conditions on CA-24 across the Caldecott Tunnel (in the morning peak) and around the new Hayward Loop where construction was completed after 2012. New congested segments were observed on some of the key interregional commute corridors in the western part of the county connecting to counties across the San Francisco Bay such as I-580, I-680, and I-880.

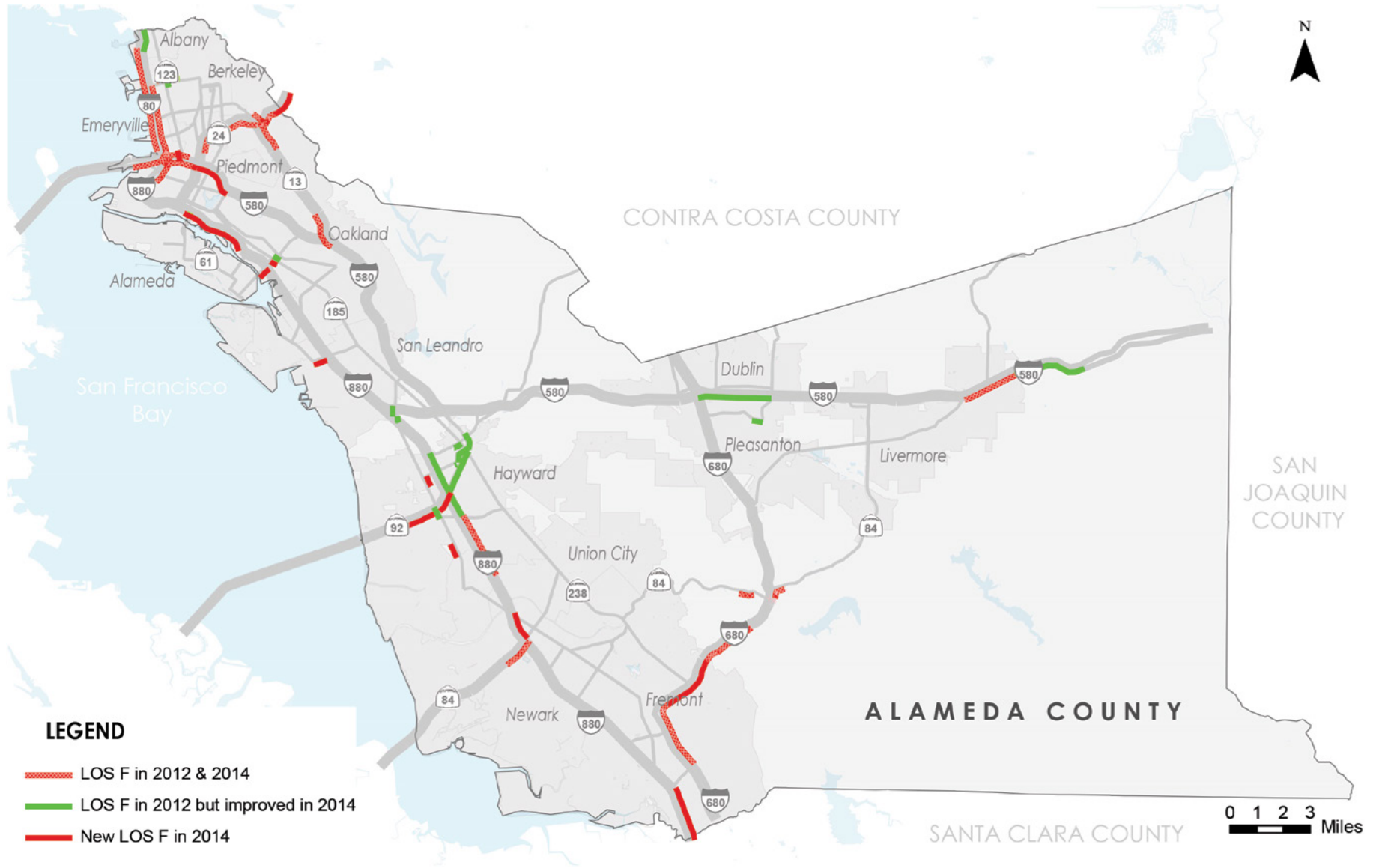


Figure 3-4: Change in Congested Segments (LOS F) from 2012 to 2014 – Afternoon Peak Period

Level of Service Results: Freeways & Arterials



Figure 3-5: Change in Congested Segments (LOS F) from 2012 to 2014 – Morning Peak Period

The following sub-sections discuss the 2014 observations particularly related to congested segments for each category of the CMP network. Each sub-section includes a table containing details of the congested segments. The tables also note the CMP segments impacted by construction and those that were congested (LOS F) in 1991 or 1992 base monitoring year (i.e. grandfathered).

3.3.1 | Freeways (Tier 1)

As shown in **Figure 3-2**, the majority of congested (LOS F) segments were located on the freeway network. There were 30 congested segments in the afternoon and 24 in the morning peak periods (**Tables 3-1** and **3-2**). Out of the 30 afternoon congested segments, 12 were grandfathered. Two segments were impacted by construction.

In the afternoon peak, the majority of these congested segments were located in the north county leading to or from the Bay Bridge. Many of the remaining congested segments were on corridors carrying traffic from San Mateo and Santa Clara counties; this is presumably traffic returning from job centers on the Peninsula and in Silicon Valley.

In the morning peak, many of the congested segments were located on I-880 and on other corridors/bridges connecting to San Francisco, San Mateo and Santa Clara counties. It is noted that the north county still contained congested segments in the morning peak, but these are fewer compared to the afternoon congested segments in the north county.



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

CMP Route	Segment Limits	Jurisdiction	CMP Route	Segment Limits	Jurisdiction
I-80 - EB	Toll Plaza to I-580 SB Merge	Oakland	I-680 - NB	SR 238/Mission to Vargas Rd.	Fremont
I-80 – EB**	I-80/I-580 (Merge) to Powell	Emeryville	I-680 NB	Vargas Rd to Andrade Rd.	Unincorporated
I-80 – EB**	Powell to Ashby	Emeryville, Berkeley	I-880 - NB	Dix Landing to SR 262/Mission	Fremont
I-80 – EB**	Ashby to University	Berkeley	I-880 - NB	Decoto to Alvarado Blvd.	Fremont
I-80 – WB**	Jct I-580 to University	Berkeley, Albany	I-880 - NB	Alv-Niles to Tennyson	Union City, Hayward
I-80 – WB**	University to Ashby	Berkeley	I-880 - NB	I-880/I238 (split) to I-880/I-80 (merge)	Oakland
I-80 – WB**	Ashby to Powell	Emeryville	I-880 - SB	I-980 to 23rd	Oakland
I-80 – WB**	Powell to I-80/I-580 (Split)	Emeryville	SR 13 - NB	Moraga Ave. to Hiller (Sig)	Oakland
I-580 – EB*	1st St to Greenville	Livermore	SR 13 - SB	Redwood to Jct. I-580 (EB Merge)	Oakland
I-580 – EB **	I-80 to I-980	Oakland	SR 24 – EB**	Jct. I-580 (on) to Broadway/SR 13	Oakland
I-580 – EB	I-980 to Harrison	Oakland	SR 24 – EB**	Broadway/SR 13 to Caldecott (enter)	Oakland
I-580 - EB	Harrison to Lakeshore	Oakland	SR 24 – EB**	Caldecott (enter) to Fish Ranch Rd.	Oakland
I-580 - WB	SH-24 On-ramp to I-80/580 Split	Oakland	SR 84 - EB	Newark Blvd./ Ardenwood Blvd. to I-880 NB (off)	Newark
I-680 - NB	Rt 262/Mission to Durham Rd.	Fremont	SR 92 – EB **	Clawiter to I-880	Hayward
I-680 - NB	Durham Rd to Washington Blvd.	Fremont			
I-680 - NB	Washington Blvd. to Rte. 238/Mission	Fremont			

* Construction ** Grandfathered

Improvements: Within the freeway network, the Caldecott Tunnel 4th bore opening represents a notable improvement in performance in the morning peak. As background information, the two-bore Caldecott Tunnel opened in 1937 in its final location. In 1964, a third bore was built, which made it possible to reverse travel in the middle bore according to the peak direction of travel. However, as the demand in the off peak direction continued to build, delays were inevitable. Weekends were especially difficult to manage. The construction of the fourth bore was completed in November 2013 and was announced to produce travel time savings in the off peak direction³.

2014 monitoring showed notable improvements in the eastbound direction during the morning peak period which now has four lanes from the previous two. In 2012, the eastbound approach to the tunnel had LOS F with an average speed 18.3 mph. In 2014, the same section of road obtained a LOS C with an average speed 54.5 mph.

³ Caldecott – Fourth Bore Project, URL (www.caldecott-tunnel.org/, accessed in Aug 2014).

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

CMP Route	Segment Limits	Jurisdiction
I-80 - WB	Central (County line) to Jct. I-580	Albany
I-80 - WB	Jct. I-580 to University	Berkeley, Albany
I-80 - WB	I-580 Split to Toll Plaza	Oakland
I-80 - WB	Toll Plaza to SF County	Oakland
I-238 - WB	I-580 to I-880	Unincorporated, San Leandro
I-580 - WB	Greenville Rd. to 1 st St.	Livermore
I-580 – WB *	1 st St. to Portola Ave.	Livermore
I-580 – WB *	Portola to SR 84/ Airway Blvd.	Livermore
I-580 – WB	SH 13 Off to Fruitvale	Oakland
I-580 – WB	SH-24 ON Ramp to I-80/580 Split	Oakland
I-580 – EB	Central (County line) to Jct. I-80	Albany
I-880 – NB	I-880/I238 (split) to Marina Blvd.	San Leandro

* Construction

CMP Route	Segment Limits	Jurisdiction
I-880 – NB	Marina Blvd. to SR 112/ Davis	San Leandro
I-880 – NB	Hegenberger to High/42 nd	Oakland
I-880 – NB	High/42 nd to 23 rd (1 st on)	Oakland
I-880 – SB	I-238 (Marina before 06) to A St.	Unincorporated
I-880 – SB	A St. to Rte. 92	Hayward
I-880 – SB	Rt. 92 to Tennyson	Hayward
I-880 – SB	Tennyson to Alvarado-Niles	Hayward, Union City
I-880 – SB	Alvarado-Niles to Alvarado	Union City, Fremont
I-880 – SB	Alvarado to Decoto	Fremont
I-880 – SB	Decoto to Stevenson	Fremont
SR 84 - WB	Paseo Padre Pkwy. to Toll Gate	Fremont
SR 92 – WB	Clawiter to Toll Plaza	Hayward

Other CMP segments that were congested (LOS F) in 2012 afternoon peak, but have improved in 2014 are:

- **I-80 Eastbound:** Jct I-580 (off) to Central (county line) (Albany)
- **I-580 Eastbound:** I-680 to Hopyard (Pleasanton), Hopyard to Santa Rita (Pleasanton), and Greenville to N. Flynn (Unincorporated)
- **I-880 Northbound:** Tennyson to State Route 92 (Hayward), and State Route 92 to A St (Hayward)



3.3.2 | Ramps and Special Segments (Tier 1)

Four ramp segments were congested in 2014 in the afternoon peak period (**Tables 3-3** and **3-4**). Two of them were grandfathered in their base monitoring year, and the ramp connector between State Routes 13/24 was also congested (LOS F) in 2012. Although the connectors from I-880 to the Webster Street/Posey Tubes had shown improvement in 2012 in the afternoon, they were observed to be congested again in the 2014. In the morning peak period, Posey Tube (northbound) as congested in both 2012 and 2014.

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

CMP Route	Segment Limits	Jurisdiction
I-580/SR 24 Interchange**	I-580 WB to SR-24 EB	Oakland
SR13/SR 24 Interchange**	SR-13 NB to SR-24 EB	Oakland
I-880/SR 260 Connection	I-880 SB to SR-260 WB	Oakland
I-880/SR 260 Connection	SR-260 EB to I-880 NB	Oakland

** Grandfathered

Table 3-4: 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-880/SR 260 Connection	SR-260 EB to I-880 NB	Oakland

Improvements: There is no improvement to congested segments on Ramps and Special Segments.

3.3.3 | Arterials (Tier 1)

In this monitoring cycle, the overall number of congested segments decreased on the arterial (Tier 1) network from 2012. In the afternoon, there were seven congested segments, of which one experienced construction and two more were grandfathered. In terms of geographical location within the county, the maps in **Appendix A** show that there is no strong clustering of congested segments on arterials (Tier 1) in either the morning or afternoon peaks. However, many congested segments appear on the same roads in the morning and afternoon peak periods indicating likely presence of consistent bottlenecks.

The major observations have been noted in **Tables 3-5** (PM) and **3-6** (AM) on the next page.

Table 3-5: Congested Segments on Arterials (Tier 1) - PM

CMP Route	Segment Limits	Jurisdiction
Hesperian - NB**	La Playa to W.Winton Ave.	Hayward
University - WB	San Pablo to 6 th	Berkeley
SR 84 - EB	Sunol Rd. to Plea - Sunol Rd.	Fremont
SR 84 - EB	SR 84 (Off)/I-680 to Vallecitos Ln.	Unincorporated
SR 112 (Davis) - EB*	Doolittle to I-880	San Leandro
SR 123 San Pablo - SB**	Park to 35 th	Emeryville, Oakland
SR 185 (International Blvd) - SB	42 nd to 46 th St.	Oakland

* Construction ** Grandfathered

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

CMP Route	Segment Limits	Jurisdiction
Hesperian - SB	A St. to W.Winton Ave.	Hayward
SR 84/Fremont (Fre) - EB	Thornton to Peralta	Fremont
SR 84 - EB	Sunol Rd. to Plea - Sunol Rd.	Fremont
SR 84 - WB	Ruby Hill/Kaithoff to Culvert	Unincorporated
SR 112 (Davis) - WB*	E 14 th to San Leandro	San Leandro
SR 262 (Mission) - WB	I-680 NB to I-880 SB	Fremont

* Construction

Improvements: The Hayward Loop, largely completed by June 2013, reported the most notable improvement on the arterial network. The project converted three previously two-way streets to one-way streets in downtown Hayward (A Street, State Route 238 – Foothill Boulevard, and State Route 185 – Mission Boulevard). **Appendix C** provides details on changes to the CMP segments through this upgrade.

Within the loop, the Foothill Blvd (State Route 238) segment has improved from LOS F to LOS D in the afternoon peak period. On the approaches to the loop:

- The north-east bound approach on Jackson Street (State Route 92) has improved from LOS F to D in the afternoon peak period;
- The westbound approach to A Street has improved from LOS F to D in the morning peak period and eastbound approach has improved from LOS F to C in the afternoon peak period. This arterial was classified as Tier 2;
- The eastbound approach on D Street has improved from LOS F to C in the afternoon peak period. This arterial was classified as Tier 2; and
- Other segments near the loop not experiencing LOS F in 2012 have also improved.

Table 3-7 shows other construction works completed between 2012 and 2014 and their corresponding influence on the performance of the CMP network.

Table 3-7: Improvements completed between 2012 and 2014

CMP Route Improvements	Segment Limits	Jurisdiction
Hesperian Blvd./Lewelling Blvd. intersection improvement to add a left turn lane; construction from Jul 2009 to Oct 2012	Hesperian Blvd. around Lewelling Blvd.	Improved performance noticed. Northbound approach to Lewelling <ul style="list-style-type: none"> • AM - LOS F to B • PM - LOS F to E Southbound approach to Lewelling <ul style="list-style-type: none"> • AM - LOS E to C • PM - LOS F to E
Isabel Ave./Rt. 84/I-580 interchange to add a new interchange and improve access to the I-580; construction completed Mar. 2012	I-580, State Rt. 84 (new alignment – newly added CMP segments) and Airway Blvd.	The freeway segments performed worse, as other construction was occurring on the I-580 during the 2014 monitoring.
Webster St. SMART corridor to implement traffic signal re-timing, transit and emergency vehicle signal priority; construction occurred between Sep. 2012 and Oct. 2013	Webster St. and Posey Tubes	Showed mixed performance change with AM showing improvement and PM showing slight decline in speeds. Declined speeds are likely due to the improved economy. Posey Tube Northbound <ul style="list-style-type: none"> • AM - LOS C to A • PM - Slight speed decrease Webster Tube Southbound <ul style="list-style-type: none"> • AM - LOS C to A • PM - LOS A to B

3.3.4 | Arterials (Tier 2)

There were only three congested segments reported on the arterial (Tier 2) network in the afternoon (**Table 3-8**) peak period and none in the morning peak period. This is expected, as by their very definition, these arterials are second tier arterials and do not typically carry high traffic volumes. Listed below are two observations:

- The segment on Broadway is categorized as LOS F under the HCM 2000, while HCM 1985 categorized the segment as LOS E. 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. Refer to **Tables 2-4** and **2-5**.
- The other two congested segments have experienced declining speeds in recent years.

Table 3-8: Congested Segments on Arterials (Tier 2) - PM

CMP Route	Segment Limits	Jurisdiction
Broadway (Connection to I-880) - SB	5th St./Broadway to I-880 ON Ramp	Oakland
High St.- EB	Fernside Blvd. to NB I-880 OFF Ramp	Alameda, Oakland
Hesperian Blvd. - Union City Blvd. - SB	Industrial Blvd. to Hesperian/ Union City Blvd./Overbridge	Hayward

Improvements: Two segments that were congested in 2012 during the afternoon peak period, improved in 2014. These are listed below:

- Winton Avenue/D Street-Eastbound: Soto Road to Foothill Boulevard/D Street (Hayward) improved from LOS F to C.
- Stoneridge Drive-Eastbound: W. Las Positas Boulevard to Santa Rita Road (Pleasanton) improved from LOS F to C.

3.3.5 | Weekend Monitoring on Freeways (Tier 1)

Congested segments on weekends were primarily concentrated in the north county similar to the weekday results; this concentration is similar to 2012 monitoring results. All segments were connections to the Bay Bridge (**Table 3-9**).

Appendix B provides detailed weekend results.

Table 3-9: Congested Segments on Tier 1 Freeways - Weekend

CMP Route	Segment Limits	Jurisdiction
I-80 - EB	I-80/I-580 (Merge) to Powell	Emeryville
I-80 - EB	Powell to Ashby	Emeryville - Berkley
I-80 - WB	Central (County line) to Jct. I-580	Albany
I-80 - WB	Jct. I-580 to University	Berkley - Albany
I-80 - WB	University to Ashby	Berkley
I-80 - WB	Ashby to Powell	Emeryville
I-80 - WB	I-580 Split to Toll Plaza	Oakland
I-580 - WB	SH-24 ON Ramp to I-80/580 Split	Oakland

3.4 | Corridor Performance Analysis

Considering that Alameda County is located at the geographic center of the region, and the employment centers are located considerably apart, either within the county or the region, trips made by drivers on the CMP network often cover several CMP segments. So, it is useful to aggregate the results for the entire corridor to understand the overall change in corridor performance. This analysis has been undertaken since 1991 for analyzing the performance in the afternoon peak period. **Appendix D** provides the full results for each corridor.

3.4.1 | Freeways

Out of the 14 freeway corridors reviewed in the afternoon peak (each direction considered separately), speeds stayed relatively stable over the long term. Exceptions to this are noted for I-680 northbound, SR 24 eastbound and SR 13 both directions where declining speeds were observed over the years. Not surprisingly, the lowest speed was experienced on I-80 in both directions. For comparing with 2012 and 2014 results, 12 corridors had average speeds within ± 5 mph of 2012 results. Most of these showed slight decrease in speeds. Of the remaining two corridors, one showed a decrease and one showed an increase (Figure 3-6).

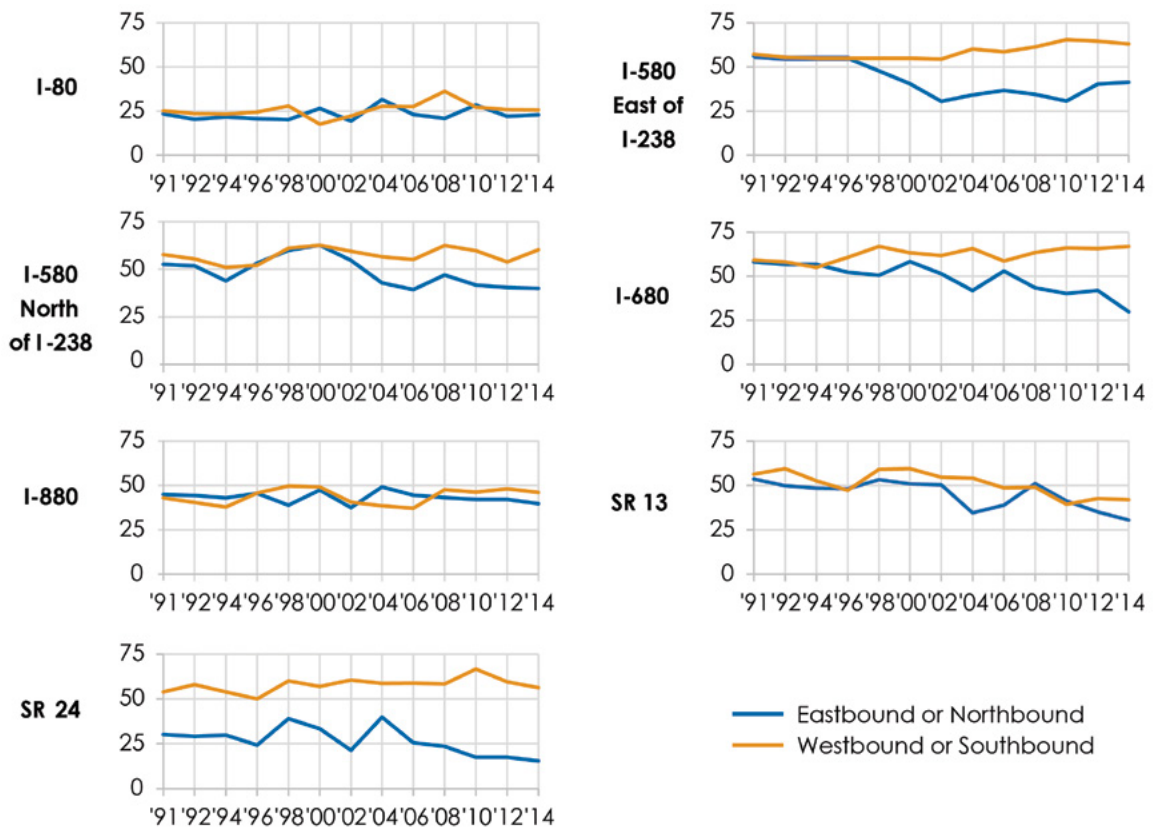


Figure 3-6: Change in Freeway Corridor Average Afternoon Speed from 1991 to 2014

There was a significant **increase** in speed on I-580 (westbound) from I-238 to I-80 between 2012 and 2014. Overall this northern portion of I-580 (constituting 14.7 miles), showed an average increase in speed of 6.4 mph, and is now performing at 2008/2010 levels. The resulting LOS improved from LOS C in 2012 to LOS A in 2014.

There was a significant **decrease** in speed on I-680 (northbound) from Scott Creek Road to Alcosta Boulevard. While the northern portion of this route continues to operate at LOS A, the average speed on the southern section between Scott Creek Road and Calaveras Road has degraded. Overall, the corridor has experienced

an average decline in speed of 12 mph resulting in an additional travel time of approximately 12 minutes. The resulting LOS degraded from LOS D in 2012 to LOS F in 2014. Two additional congested segments were also identified in 2014.

3.4.2 | Arterials

Historic corridor monitoring has been conducted on 24 arterial corridors (each direction considered separately). The Decoto Road/Dumbarton Bridge corridor includes both a freeway and arterial component. Of these 24 corridors, 21 had average speeds within ± 2.5 mph of 2012 results; with the majority showing slight decreases in speed.

Of the remaining three corridors, one showed a significant increase and two showed a significant decrease. Changes in average LOS were not reviewed as the arterial class of the segments varied along the arterial corridors.

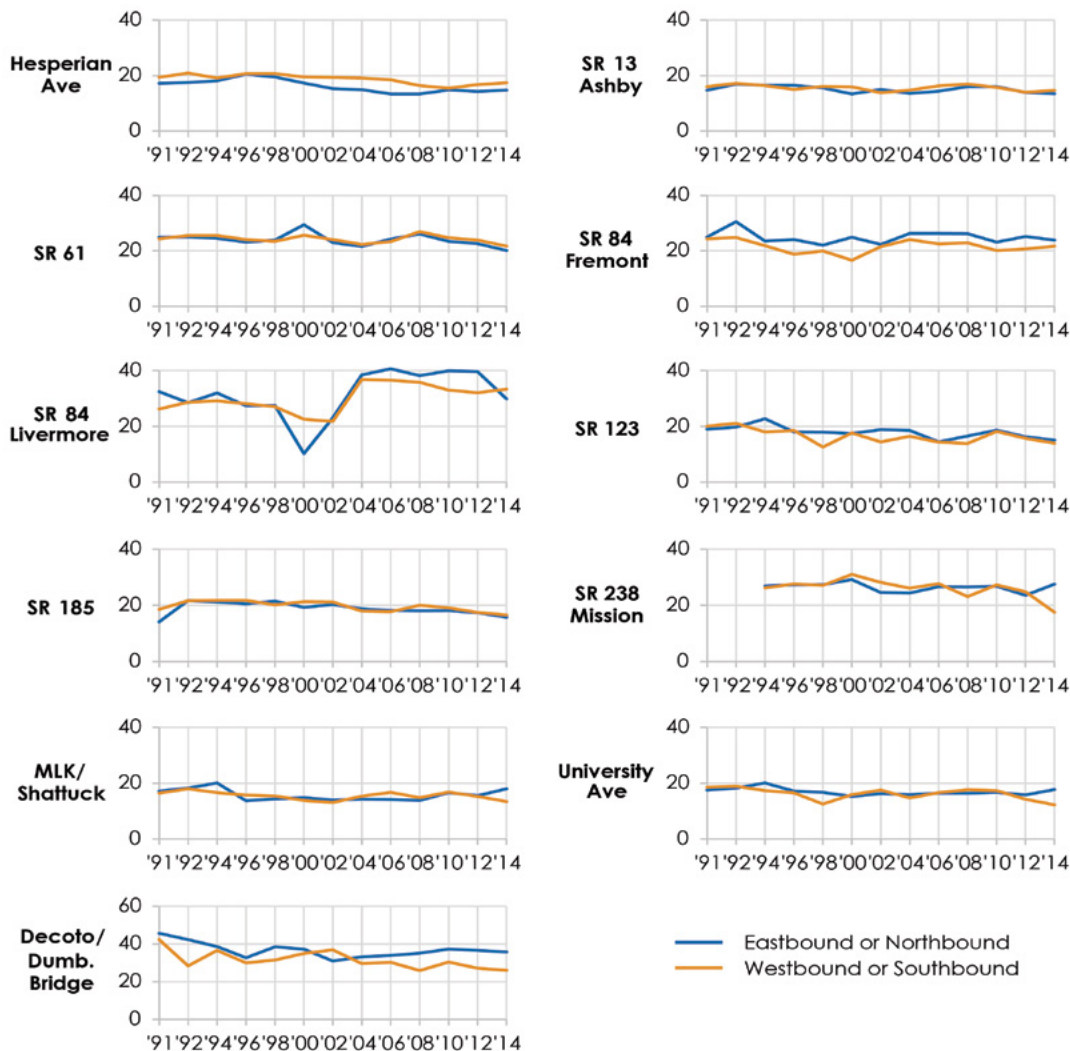


Figure 3-7: Change in Arterial Corridor Average Speed from 1991 to 2014

The majority of the Alameda County CMP corridors showed slight decreases in average speed in 2014.

Review of long term trends on these arterial (Tier 1) corridors show that speeds stayed relatively stable in the afternoon peak with the exception of Decoto Road/Dumbarton Bridge and SR 84 in Livermore. SR 84 in the Tri-Valley area showed a significant drop in speeds during 2000, the dot com boom period, and then a steady increase thereafter. Speed on Decoto Road/Dumbarton Bridge has been declining gradually over the years, reflecting the regional nature of traffic this road carries.

For the comparison between 2012 and 2014 performance, there was a significant **increase** in speed on State Route 238 Mission (Northbound) from I-680 in Fremont to Jackson in Hayward approaching the loop between 2012 and 2014. The average speed increased by 3.9 mph.

There was a significant **decrease** in speed on State Route 84 (westbound) from I-580 to Isabel: This corridor declined in speed by 9.8 mph. It comprises of six CMP segments and all but one segment experienced significant decrease in speed.

Level of Service Results: HOV & Express Lanes

4

Considering the importance of HOV and express lanes in improving the overall performance of a corridor, Alameda CTC started monitoring these facilities in 2014. These facilities are also called managed lanes. Out of the total 83.7 miles of managed lanes, 72.5 miles are HOV lanes along many major freeways and 11.2 miles are express lane along I-680 (southbound). Results are presented in **Appendix B, Tables B-10 and B-11.**

4.1 | Congested Segments

Travel time data for HOV and express lanes from 2014 revealed that six segments were congested in the afternoon peak (**Table 4-1**) and three in the morning peak (**Table 4-2**). These occurred mostly on major regional and interregional corridors such as I-80, I-880, I-580, and the San Mateo Bridge (State Route 92).

With the exception of State Route 92, all of the corresponding general purpose lanes in the freeway segments were also congested.

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

CMP Route	Segment Limits	Jurisdiction
I-80 - EB	Begin of HOV to I-80/I-580 (Merge)	Oakland
I-80 - EB	I-80/I-580 (Merge) to Powell	Emeryville, Berkeley
I-80 - EB	Powell to Ashby	Emeryville, Berkeley
I-580 - EB*	1st St to Greenville	Livermore, Unincorporated
I-880 - NB	SCL County Line to SR 262/Mission	Fremont
I-880 - NB	Alvarado-Niles Blvd. to Tennyson	Union City, Hayward

* Construction

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

CMP Route	Segment Limits	Jurisdiction
I-80 - WB	Central (County line) to Jct. I-580	Berkeley, Albany
I-80 - WB	Jct. I-580 to University	Berkeley, Albany
SR 92 - WB	Begin of HOV (Hesperian Blvd.) to Clawiter	Hayward

Express lanes differ from HOV lanes in that they are considered congested if they are assigned LOS D, E, or F. Review of 2014 results revealed no congested segments on express lanes in either peak period.



Table 4-3: 2014 Average Speed of Managed Lanes (mph)

	HOV	Express Lane
PM	49.3	67.4
AM	56.3	64.9

4.2 | Average Speeds

Appendix A contains the maps showing the HOV and express lanes' performance. Since this is the first monitoring effort to collect this data, comparisons in future years are possible based on the current results. For a baseline reference, the average speed of the managed lanes is presented in **Table 4-3**.

4.3 | Comparison to Freeway Performance

Through the implementation of these managed lanes, Alameda CTC and associated agencies are not only encouraging commuters to carpool (HOV lanes), but are also maximizing efficiency by facilitating the access of managed lanes to single rider vehicles through a toll (express lanes). By meeting these occupancy or payment requirements, HOV/express lane users gain access to managed lanes that are unavailable to general purpose lane users. This section reviews the effect of these managed lanes by comparing freeway general purpose lane performance to managed lane performance. **Appendix B** presents detailed data of managed lane performance.



The results indicate that speeds along HOV lanes were generally faster than the corresponding freeway general purpose lane segments by an average of 2.6 mph in the afternoon peak period and 10.8 mph in the morning peak period⁴. These values were weighted by distance consistent with methods used in freeway monitoring from previous cycles. While HOV performance is generally faster, these managed lanes still experienced congestion at similar locations and time periods as the general purpose lanes. For example, it was not common to observe free flowing HOV lanes when the adjacent general purpose lanes were notably slower.

On the other hand, the performance along express lanes was comparable across all freeway general purpose lanes during the afternoon peak period. During the morning peak period, express lanes exhibited faster speeds in some freeway sections by up to 20 mph.

The plots shown in **Figure 4-1** provide a comparison of the speed along the freeway (all lanes) and their adjacent managed lanes for afternoon and morning peak periods. Each graph contains a diagonal line which represents parity between the average speeds along freeways and HOV/express lanes. Data points above the line indicate that average speeds on the managed lanes were faster than the freeway speeds. This was the case with the majority of the data points during both

⁴ Comparison of managed lanes to freeways should consider that freeway surveys include all lanes of the freeway (including general purpose and managed lanes) due to the current inability of commercial speed data to separately report speeds lane by lane. However, freeway speeds will be more representative of general purpose lanes as there are more of these lanes than managed lanes.

the peak periods, indicating that managed lanes were less congested than the general purpose lanes, as expected. However, a minority of data points are below the diagonal line, indicating exceptions, likely due to different sampling rates.

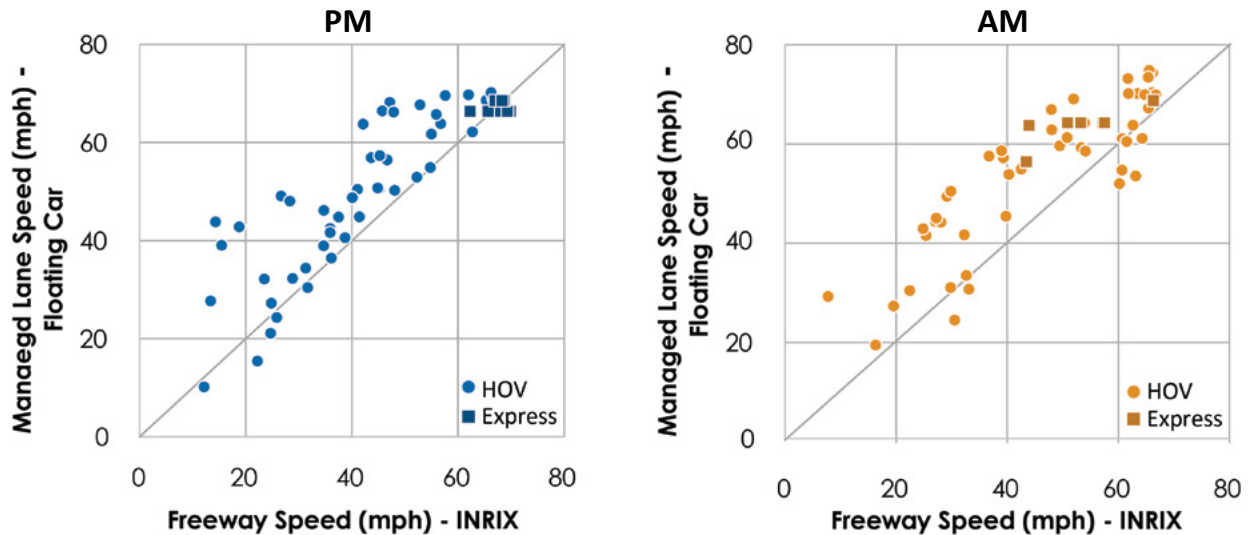


Figure 4-1: Freeway (Tier 1) to HOV Speed Comparison

While these graphs are useful to compare the performance across different types of freeway lanes, it is important to understand that different data collection methodologies were used, i.e. floating car surveys for managed lanes and commercial speed data for general purpose lanes. Hence, the comparison should consider the following:

- Floating car surveys have a limited sample size (six) compared to the commercial data (in thousands). By using an increased sample size, the data obtained is more representative of the average conditions throughout the monitoring period and is less prone to influence from individual events; and
- Commercial data includes data for both general purpose and managed lanes due to the current inability of commercial speed data to report on speeds lane by lane. However, freeway speeds captured by commercial data will be more representative of general purpose lanes as there are more of these lanes than managed lanes. Hence, it is reasonable to expect 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, they were still comparable, and generally showed the anticipated difference in performance. Also, undertaking this effort for the first time provided Alameda CTC with a quantitative comparison of the performance of managed lanes within congested freeway corridors. In future years, commercial speed data may be available explicitly for managed lanes which would provide a more accurate comparison.

5

Travel Time Results for Bay Crossing Bridges



Alameda County is the geographic center of the region. It borders with the San Francisco Bay on the western side and the three bay crossing bridges (Bay Bridge, San Mateo Bridge, and Dumbarton Bridge) provide critical transportation conduits to major employment centers in San Francisco, the Peninsula and Silicon Valley. As background information, the Bay Bridge toll is currently priced at \$6 in the weekday commute periods (between 5:00 AM and 10:00 AM, and between 3:00 PM and 7:00 PM) and \$5 on weekends. The San Mateo and Dumbarton Bridges tolls are \$5. Also, the speed limit is lower on the Bay Bridge (50 mph) compared to 65 mph on the other two bridges.

Alameda CTC has been monitoring the performance of these three bridges using travel time data since 2002. This was accomplished by using data collected by Caltrans or MTC or from Toll Tag information. The methodology and end points used to monitor the bridges have varied in the previous monitoring cycles depending on the data source.

Starting in 2014, commercial data was used to collect the speed data on the bridges similar to freeway segments. This is expected to allow a direct comparison of trends in the future due to consistency in methodology, which was not possible with data from previous years. The 2014 data presented in **Appendix B, Tables B-12 through B-14** can be used as a baseline to enable comparisons in future years.

Based on the 2014 data, it was possible to compare the performance of the bridges to each other. It is recognized that some commuters may have the choice of using two bridges for their daily work commute or for weekend travel. The likely choices for drivers may be between the Bay Bridge and San Mateo Bridge, or between San Mateo Bridge and Dumbarton Bridge. **Figure 5-1** compares the performance of each bridge from the county line to the first exit on the SF/Peninsula side. Generally, more congestion was experienced around the toll both areas. **Appendix B, Tables B-1 to B-3** provides detailed supporting data for segments within Alameda County, and **Appendix B, Tables B-12 to B-14** provides data for segments in adjacent counties.

A typical Alameda County resident accessing San Francisco or the Peninsula for work, would travel westbound towards SF/Peninsula in the morning and eastbound towards Alameda County in the afternoon. For such residents choosing between the Bay Bridge and San Mateo Bridge, there is little difference in the average speed (with 2 mph in the morning peak and 4 mph in the afternoon peak approximately). For residents choosing between the San Mateo

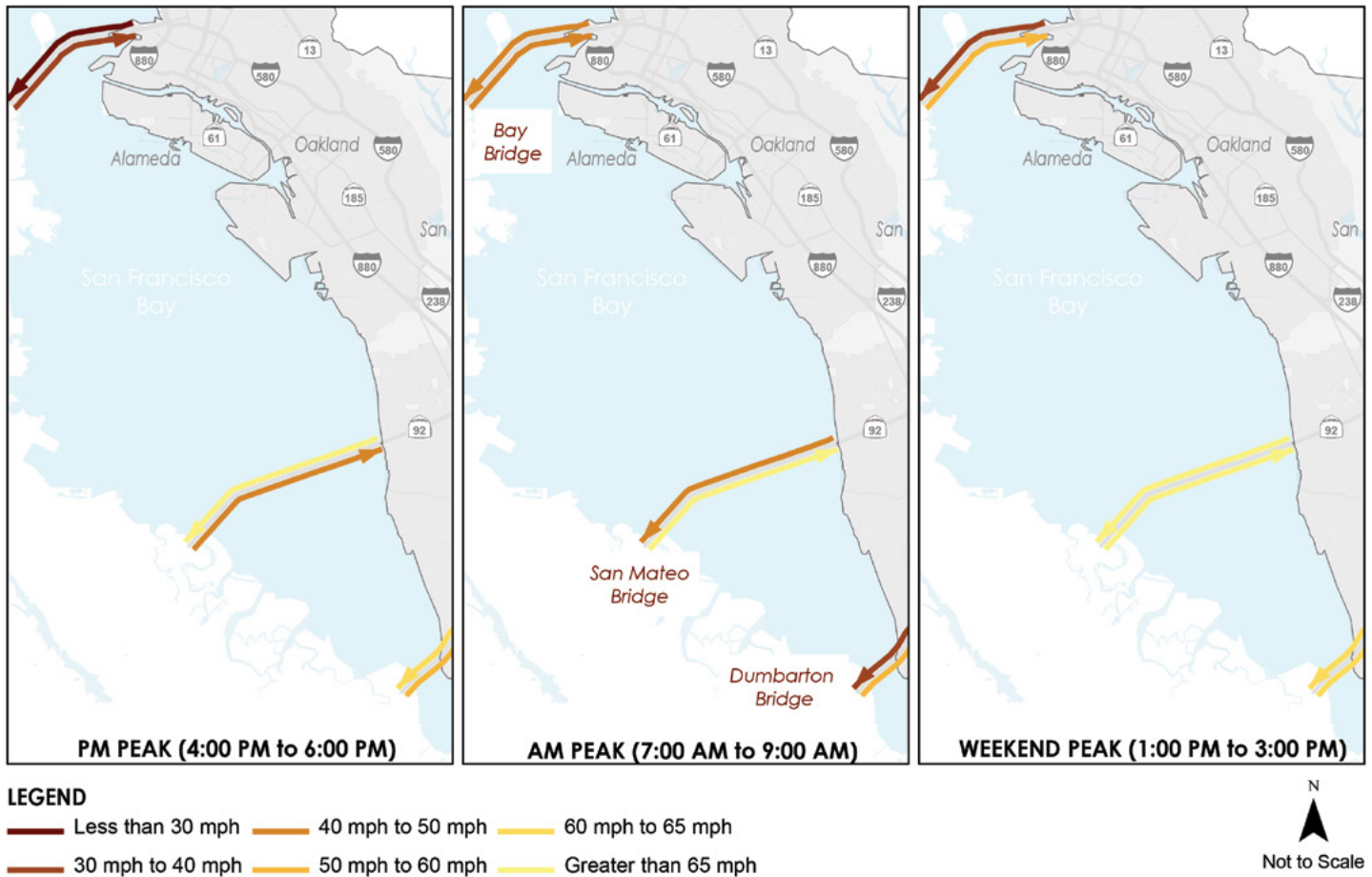
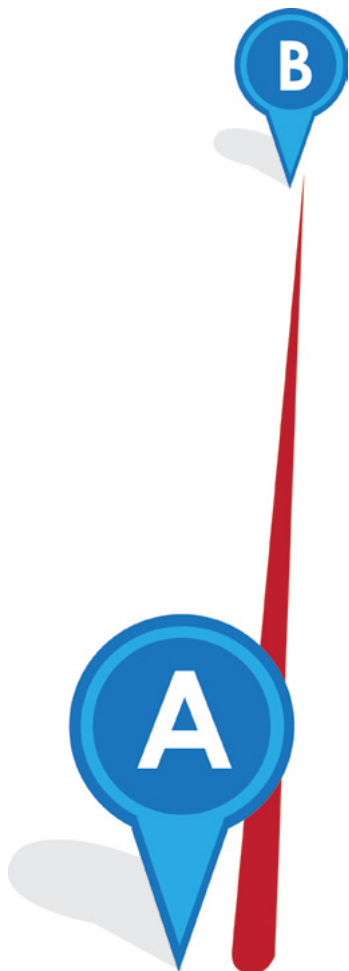


Figure 5-1: Map of Bridges across San Francisco Bay and Average Speeds in each Peak Period (mph)

and Dumbarton Bridges, the difference is higher (with 10 mph in the morning peak and 11 mph in the afternoon peak approximately). Interestingly, San Mateo Bridge shows faster speeds in the morning and Dumbarton has faster speeds in the evening. On the weekend, the San Mateo Bridge has fastest speeds reported in both directions of the three bridges.

As expected, the average speed on the Bay Bridge is lower compared to the other two bridges in all time periods. This highlights the higher interregional and regional traffic demands on this key connection to San Francisco. On the weekend, recreation trips to San Francisco make the Bay Bridge congested and experience slow speeds comparable to the weekday peak periods.

Travel Time Results for Origin-Destination Pairs



The purpose of the OD surveys is to compare the performance of various transportation modes between major employment centers and residential areas in Alameda County. These surveys help understand the journey-to-work travel times in the county. Surveys for some of these ten routes began as early as 1996. **Section 2.2.3** contains the survey methodology.

In 2014, all the OD routes were reviewed and updated as reported in **Appendix C**. All transit schedules were reviewed in order to obtain the quickest travel time between the specified origin-destinations. As a result, new transit options were chosen for Route 2 (between Emeryville and Berkeley), Route 5 (between Fremont and Pleasanton), Route 6 (between Fremont and San Jose) and Route 10 (between Alameda and Oakland).

On average, travel times on transit routes were approximately twice as long as auto routes between the same origin-destinations. However, transit travel times are decreasing on five of the nine routes, while auto/HOV times are increasing compared to previous monitoring cycles⁵. Two of the five OD pairs (Oakland-San Leandro and Fremont-San Jose) show transit travel time improved to be somewhat comparable to auto travel time. Overall, this indicates that transit performance is improving on selected routes at the same time as the road network in that area is becoming more congested. **Figure 6-1** shows a graph of the OD results for 2014 and the previous year. **Appendix E** presents detailed results for all years.

The routes from Emeryville to Berkeley (OD 2), Oakland to Pleasanton (OD 8), and Alameda to Oakland (OD 10) showed similar travel times to previous monitoring efforts, across all modes.

The route from Hayward to Livermore (OD 3) showed an increase in both transit and auto travel times. This increase in transit travel time was influenced by a missed bus connection caused by a slightly late running BART segment. Since the scheduled Wheels 12 bus serves this route only once every 30 minutes, a large delay was experienced which increased the overall travel time. In the next monitoring cycle, this route will likely return to previously observed values. The increase in auto travel time on this route is likely influenced by the construction on I-580 between Greenville overcrossing and Isabel Avenue and may also recover in the next monitoring cycle.

⁵ Three (Hayward-Newark, Oakland-San Leandro, and Fremont-Alameda) of these five OD pairs used the same routes as in the prior monitoring cycles.

For a better comparison of auto and transit modal performance, a large-scale, automated transit monitoring study will be a valuable input. Through increasing the robustness of the transit monitoring in line with that of Alameda CTC's robust auto/ roadway monitoring, the comparison between auto and transit modal performance will be more effective. More discussion on this is included in **Section 8.4.2**.

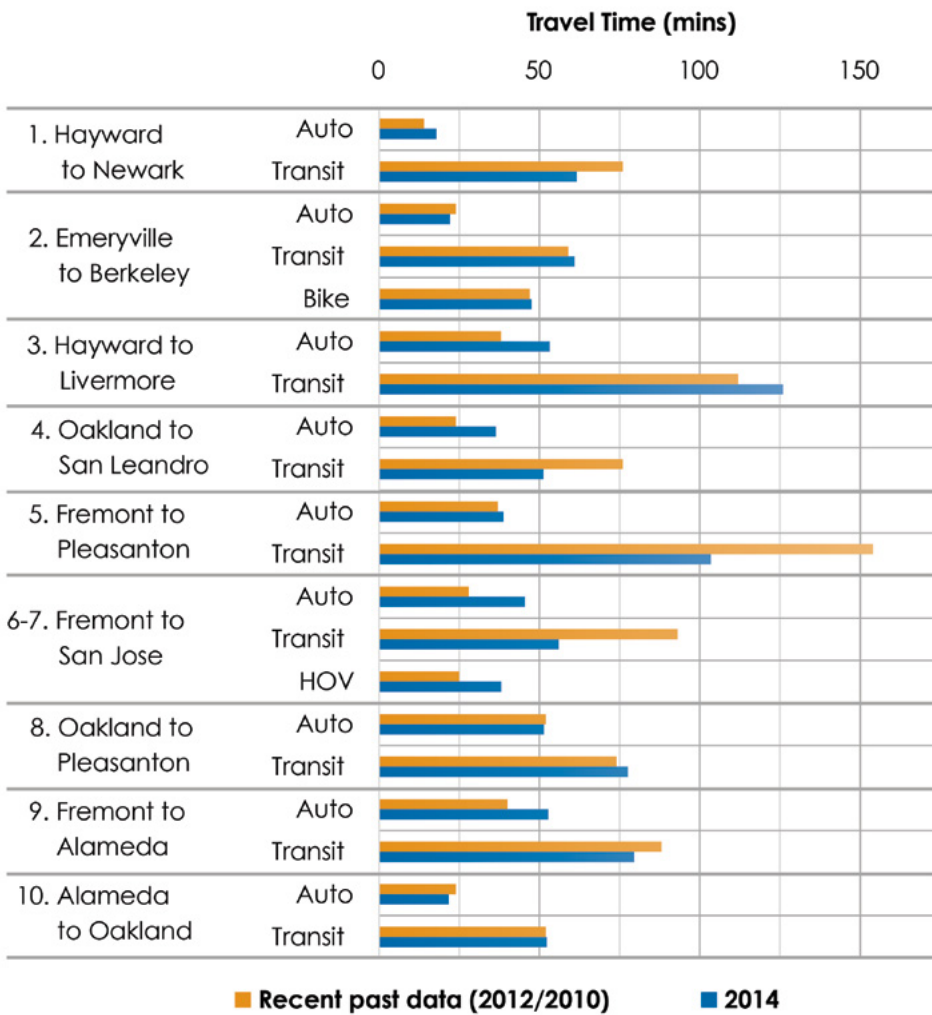


Figure 6-1: OD Survey Results

Average speeds on the CMP network declined and almost returned to pre-recession speeds in 2014, after peaking in 2010 during the economic recession.

Alameda CTC has been monitoring the performance of the CMP road network since 1991. In recent times, there has been a noticeable change in congestion on the network and overall performance influenced by the economic conditions in the Bay Area and the nation. This section analyzes the long term trends since 2005/06, and relates the performance of the transportation network to external factors that likely influence the traffic volume on the network such as the economy, levels of employment, demographics and transit ridership.

Overall, average speeds on the CMP network almost returned to pre-recession speeds in 2014, after peaking in 2010 during the economic recession. **Figure 7-1** shows the average CMP network speeds on freeways and arterials between 2006 and 2014. Considering the large extent of the CMP network being monitored, the slight increase in average network speed, peaking in 2010 by 0.8 mph to 51.8 mph on freeways and 0.4 mph to 26.1 mph on arterials, represents a significant improvement in network performance for both freeways and arterials.

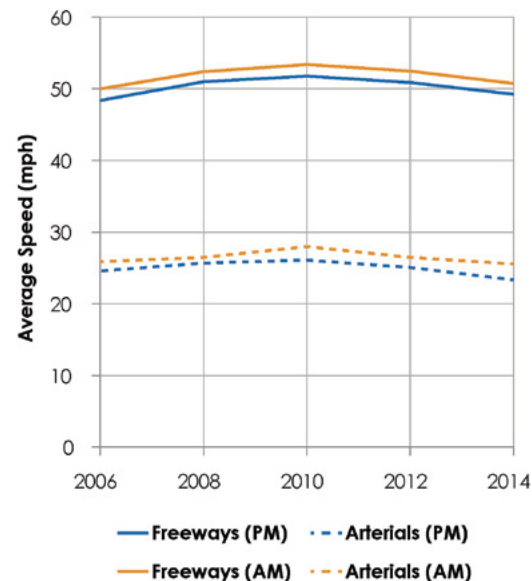


Figure 7-1: Average Speed on CMP network (mph)

7.1 | Review of Jobs and Economic Recovery

The economic activity and residential population in Alameda County were reviewed and compared to the traffic conditions experienced on the CMP network (**Figure 7-2**). While the number of residents in Alameda County continued to increase since 2006, employment has seen its ups and downs due to the recession. In 2009, employment in the county dropped significantly and was

at its lowest level in 2010. By 2011, it began to recover with more significant improvements in 2012 and 2013.

As mentioned previously, average freeways and arterials speeds show a close correlation to employment. Employment decreased around 2010 and therefore fewer workers commuted during the peak periods, resulting in improved speeds across the roadway network. As employment recovered after 2012, CMP roadway speeds declined demonstrating that the roadway performance was more closely correlated to employment levels than the residential population.

Although employment in the county increased from 2012 to 2013, employment was still not as high as pre-recession years. If employment continues to improve, it would likely further impact the roadway performance, and this may be captured in the next monitoring cycle.

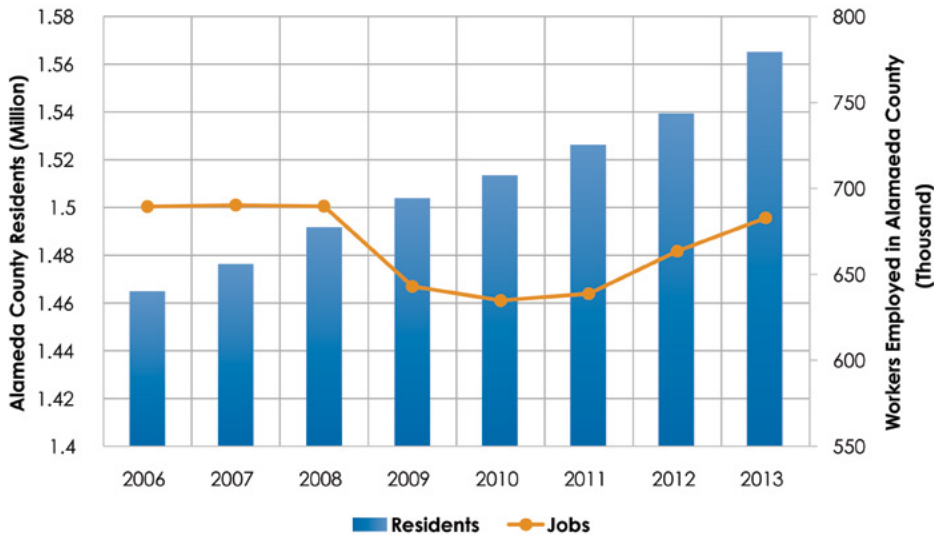


Figure 7-2: Alameda Population and Employment (Source: 2010 US Census)

Since Alameda County is the geographic center of the Bay Area, regional and inter-regional commutes impact many of the regional connectors; particularly I-880 and the three bridge crossings connecting Alameda County with the regional employment centers of Silicon Valley (Santa Clara County), San Francisco and the Peninsula (San Mateo County). Employment data shows that there were fewer unemployed workers in the wider Bay Area than in Alameda County between 2009 and 2013 (**Figure 7-3**). In other words, Alameda County lags behind the other neighboring counties in employment recovery. With higher employment levels in other counties, as evident from **Figure 7-4**, there has been an increase in vehicle volumes across the bridges and regional corridors to other counties between 2012 and 2014 in both the morning and afternoon peak periods. There has also been a 5% increase in vehicle volume on I-880 towards Santa Clara County.

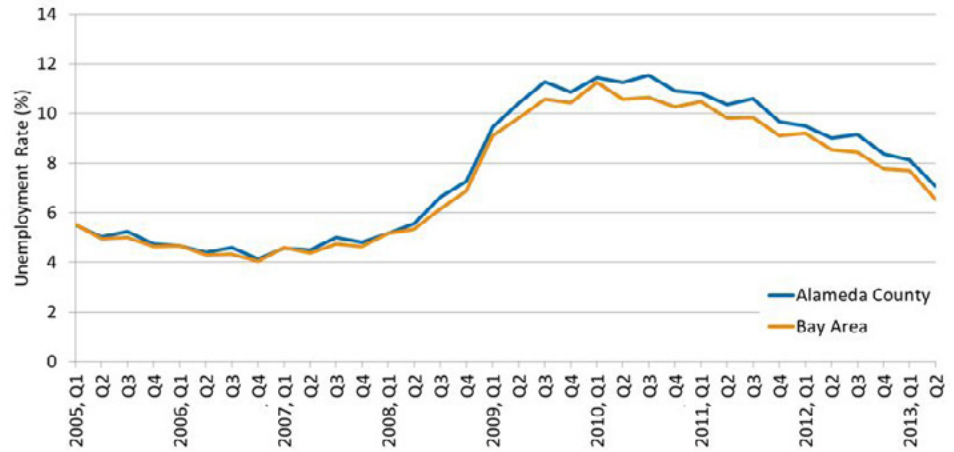


Figure 7-3: Quarterly Unemployment Rate (Source: Bureau of Labor Statistics)

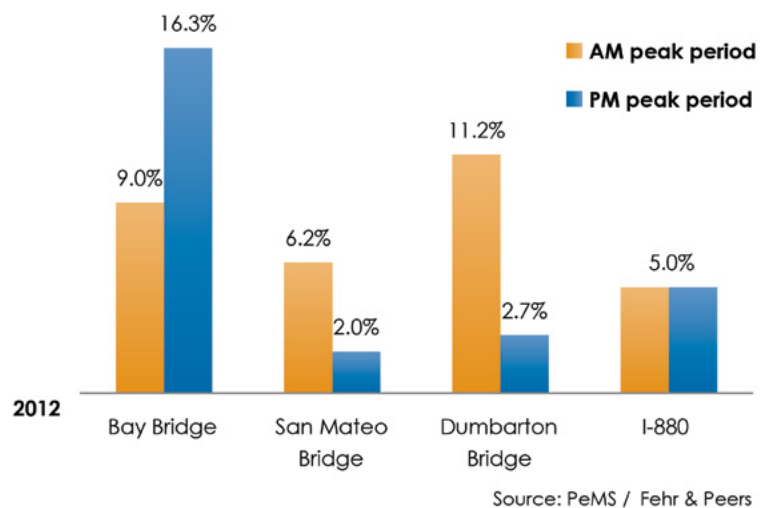


Figure 7-4: Percent Change in AM/PM Peak Volumes from 2012 to 2014 (five hour peak period)

The CMP roadway speeds were also compared to public transit ridership, specifically on BART, a major regional transit system. **Figure 7-5** shows the relationship between average freeway speeds and BART ridership. In 2010, at the peak of recent unemployment, BART ridership was low and the demand on freeways had lessened as is evident from the reported faster freeway speeds. During the economic recovery in 2012 and 2014, the demand on these two transportation services has increased, showing increasing BART ridership and declining average freeway speeds.

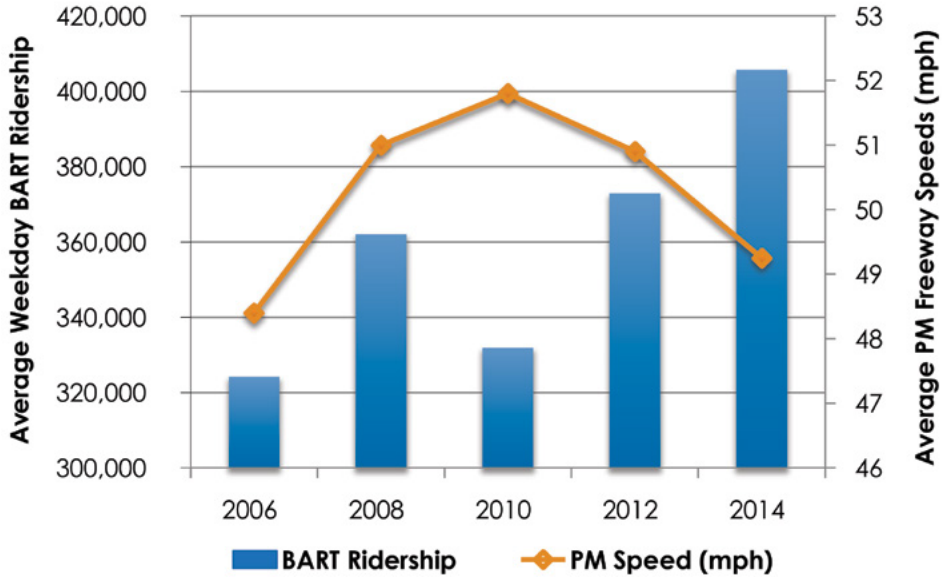


Figure 7-5: PM Peak Average Freeway Speed and BART Ridership (Source: BART)





The improving economy and greater levels of employment observed in 2014 have generally resulted in higher demands on the transportation network. This is apparent through declining speeds on the CMP network and increased ridership on BART - continuing the trends observed since 2010. The speed reduction on freeways and arterials in 2014 ranged between 0.9 mph and 1.7 mph.

Construction activities, both those recently completed and those currently underway also impacted the 2014 performance. The two notable locations showing improvements due to construction completion were the Caldecott Tunnel 4th bore and the Hayward Loop.

This final section highlights the LOS results in terms of conformity and summarizes upcoming improvements to the road network that may be encountered in the next monitoring cycle or beyond. As a final discussion, innovative ideas are considered to further improve future LOS Monitoring Studies. These ideas focus on expanding the use of Big Data and inclusion of countywide monitoring of alternative modes.

8.1 | 2014 CMP Conformity

CMP conformity is evaluated for the Tier 1 network in the PM peak period on segments that fail to meet the LOS E threshold and operate at LOS F. There were 42 segments operating at LOS F in 2014 in the PM peak period. Of these 42 segments, 18 were exempt from deficiency planning requirements because they were either grandfathered in the 1991 LOS surveys or impacted by construction. Based on the select link analysis performed on the remaining 24 segments using the Alameda Countywide Travel Demand Model, no new segments were identified as deficient in 2014 after applying the statutorily applicable exemptions. Alameda CTC will continue to monitor the implementation of active deficiency plans as part of the annual CMP Conformity Process.

8.2 | Construction Work Underway During 2014 Monitoring

In 2014, one of the major impacts on road network performance was the construction and maintenance activities, particularly on major corridors. Although it is not typical to close lanes during peak hours, these works often still unavoidably impact traffic flows either through the traffic friction caused by narrower lanes, presence of concrete barriers at close proximity, or gawking by roadway users.

In Alameda County, major construction work was present on I-580 in East County, I-880 in North, Central and South County, and I-80 in North County (also underway in 2012, but generally non-intrusive to traffic performance). On the arterial network, State Route 112 (Davis Street) and State Route 262 (Mission Boulevard) were under construction. **Figure 8-1** maps the location of the AM and PM congested segments, and shows associated major construction work. These construction activities are commonly undertaken in areas that are already performing poorly to improve performance. The next LOS monitoring cycle in 2016 will likely show improved performance resulting from the completed improvements.

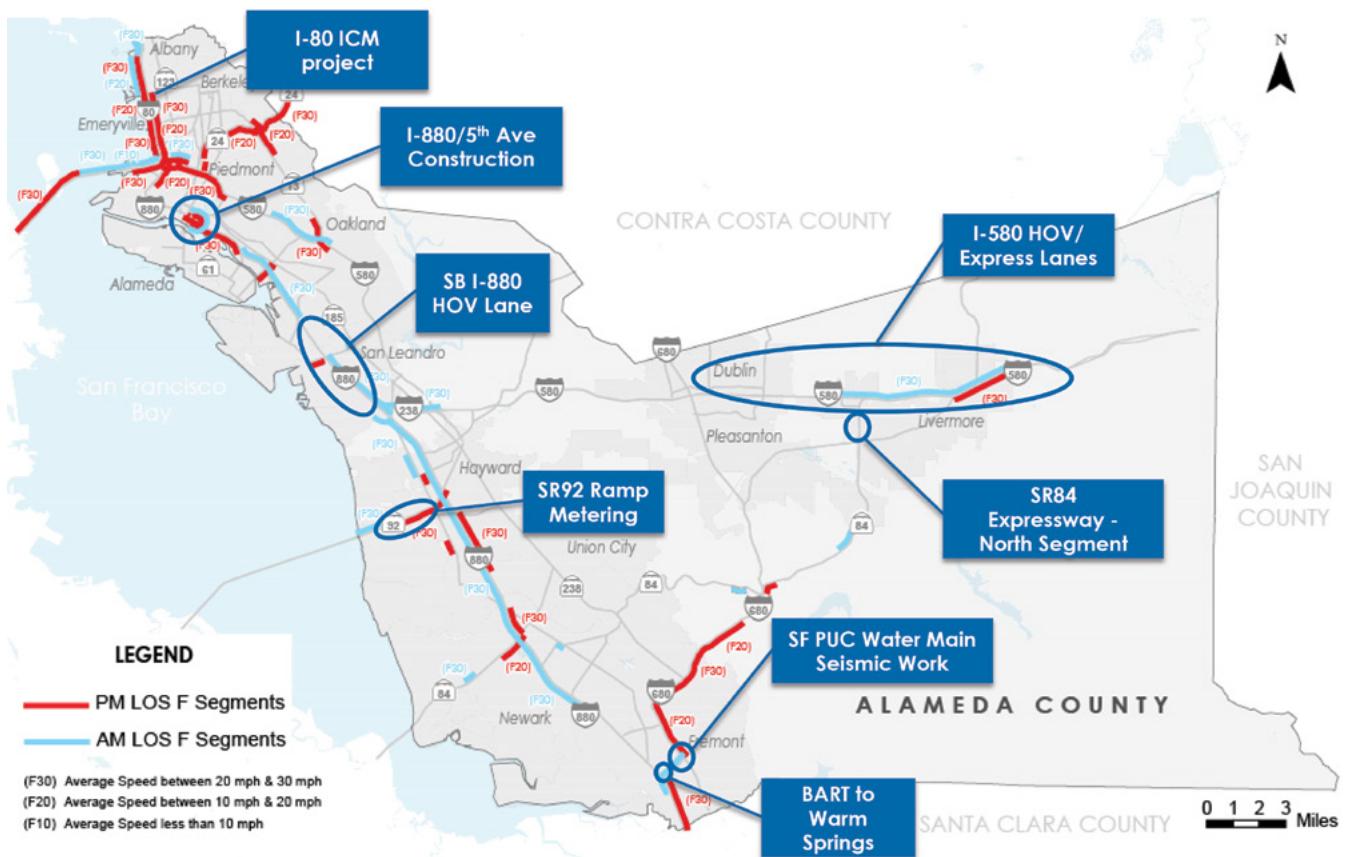


Figure 8-1: 2014 Congested segments as associated construction works

Major work currently underway includes:

- I-580 HOV/Express Lanes:** Major construction works are currently underway along both directions of I-580 in the Tri-Valley area. This will add express lanes in both east and westbound directions to improve person throughput and performance of the corridor in general. The I-580 in the Tri-Valley area is one of the most congested corridors in the region and has continued to experience reduced speeds in 2014. There was a new congested segment in the westbound morning peak.

- **I-880 Improvements:** A number of projects are currently under construction along the I-880 corridor including I-880/5th Avenue Seismic Retrofit in the north county, southbound HOV lanes in the central county between Hegenberger Road to Marina Boulevard, and bridge construction on State Route 262-Mission Boulevard near I-880 related to BART Warm Springs Extension project. Southbound in the morning peak and northbound in the afternoon peak experienced congestion. Many congested segments were reported on I-880 during these periods, generally in the vicinity of these projects.
- **I-80 Integrated Corridor Management (ICM) Project:** As one of the most congested corridors in the Bay Area, this corridor experienced congested conditions on many segments in the morning, afternoon, and weekend peak periods. This project will implement adaptive ramp metering and incident management on the 19.5 mile portion of I-80 from San Francisco-Oakland Bay Bridge Toll Plaza to Carquinez Bridge in Contra Costa County. This project aims to improve performance by maximizing use of existing capacity. The project also includes improvements on a parallel route, San Pablo Avenue. This route had one congested segment and other segments trending towards slower speeds. Under this project, San Pablo Avenue will see improvements to signal infrastructure and coordination, for improved traffic flow.

8.3 | Future Planned Network Improvements

To realize future performance improvement, Alameda CTC is currently studying the county's multimodal transportation issues comprehensively through the following three plans:

1. **Goods Movement Plan** – Development of a long-range strategy for how to move goods efficiently, reliably, and sustainably within, to, from, and through Alameda County by roads, rail, air and water.
2. **Transit Plan** – Identification of near and long-term transit capital and operating priorities in the county to reduce travel times, and improve access and connectivity.
3. **Multimodal Arterial Plan** - This plan will study the county's major arterials to identify strategies and solutions for improving multimodal connectivity, access, and mobility.

Alameda CTC has also developed a comprehensive 2014 Transportation Expenditure Plan. This 30-year plan would generate nearly \$8 billion for essential transportation improvements such as expansions to BART, investments in aging highway corridors, improvements in air quality, and funds for maintenance of city infrastructure. This plan will come before voters on the November 2014 ballot under Measure BB.

In addition to the projects under construction discussed above, 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 Performance
In Project Development Phase/Programmed/Planned		
I-880 North Safety and Operational Improvements at 23 rd Ave. and 29 th Ave.	Project proposes to construct operational and safety improvements on I-880 at the existing overcrossings of 23 rd Ave. and 29 th Ave. in the City of Oakland; construction begins in mid-2014 and ends in 2018	Congested segments were present on I-880.
I-880 Broadway - Jackson Interchange Improvements	Project includes development work to identify improvements between I-880, I-980 and local Oakland streets, including access to and from the Posey/Webster Tubes which connect Oakland and the City of Alameda; project is currently in the Scoping Phase	Congested conditions were experienced on I-880 and on connector segments to Posey/Webster tubes.
Eastbound I-580 Truck Climbing Lanes	Truck climbing lane from Greenville Rd. to one mile east of North Flynn Rd.; under construction with estimated completion by end of 2015	I-580 contained congested segments in this section in the afternoon peak.
Eastbound State Rte. 84	Rte. 84 Expressway - South Segment Project involves widening a 2.4 mile section of SR 84 (Isabel Ave.) from Ruby Hill Dr. to Concannon Blvd. from two lanes to four lanes; construction begins in 2015 and will be completed in 2017	The northbound approach experiences congested conditions in the morning peak.
Rte. 92/Clawiter - Whitesell Interchange and Reliever Rte.	Project involves improving access to and from Rte. 92 in the area of the existing Rte. 92/Clawiter Rd. interchange; construction begins in mid-2014 and ends in 2016	Congested conditions were experienced on the CA-92 in places in both morning and afternoon peaks.
Northbound I-680	HOV/express lane implementation from State Rte. 237 to north of State Rte. 84 including additional auxiliary lanes and allowances for tolling infrastructure; project is currently in the Environmental Phase	Congested conditions were experienced on the I-680 in the northbound direction in the afternoon peak.

8.4 | Recommendations for Future LOS Monitoring Studies

Significant improvements were made to the LOS Monitoring methodology in this monitoring cycle such as the use of commercial data, inclusion of HOV/express lanes and bridges, and developing arterial classification for Tier 2 network. To continue further improvement and to expand the scope of the LOS monitoring for larger level applications Alameda CTC could consider the following recommended enhancements.

8.4.1 | Expanding the Use of Big Data

In 2016, Alameda CTC may consider expanding the use of commercial speed data to survey all arterials and HOV/express lanes as well.

Arterials (Tier 1): In 2014, arterials (Tier 1) were monitored using floating car surveys as the 2013 Validation Study recommended continuing floating car surveys since commercial speed data sample available then did not result in adequate validation for further use on these segments. Since 2012, INRIX has updated their algorithms on arterials to be based on travel times. Therefore it is recommended that Alameda CTC verify the appropriateness of the updated algorithms using the 2014 data.

HOV and express lanes: These managed lanes were also monitored using a floating car methodology as exclusive managed lanes data was not available. These floating car surveys are more resource intensive than conventional floating car surveys due to the multiple passenger occupancy requirements. Prior to the next monitoring cycle, it is recommended that a review be undertaken to determine if alternative managed lane data is available such as exclusive commercial speed data for managed lanes or data collection methodology.

8.4.2 | Monitoring Alternative Modes

Monitoring of alternative modes has been undertaken since 1996 through ten OD surveys. The objective is to compare the time taken to travel between major employment origins and residential destinations by various modes - auto, transit, bike and HOV. While these surveys provide a useful insight to understand the competitiveness of different modes, results from only ten survey routes limit the capability to facilitate countywide improvement.

Instead, these OD surveys may be replaced by dedicated, countywide travel time monitoring of each mode independently and then compared to each other by estimating the travel time from specified origins-destination pairs for a complete OD analysis. The analysis will reveal strengths and weaknesses of each mode allowing for informed decisions on the county transportation system. This section presents information about monitoring for each mode, monitoring of transit transfers, and finally the OD comparison across modes.

Auto: Obtain travel times from current LOS monitoring.

HOV: Obtain travel times from current HOV/express lane monitoring.

Bike: Evaluate the utility of bike travel time information and if beneficial, monitor bike performance on additional key bike corridors. Alternatively, bike monitoring may revert to data collection in the CMP Performance report (including counts and collision information).

Transit: Explore innovative methodologies to conduct countywide transit monitoring using a desktop approach instead of in-field surveys of ten OD routes.

One such methodology involves remote monitoring of real time departures using publically available data from the 511 SF Bay Developer Resource Website⁶. Alternatively, Alameda CTC may request access to Automated Passenger Counts (APC) or Automatic Vehicle Location (AVL) data from each transit operator (where available). In either method, the sample size of transit data would significantly increase allowing for additional analysis (including reliability

⁶ 511 SF Bay Developer Resources: 511.org/developer-resources.asp

of on-time arrival), and improved confidence in the results. To maximize the effectiveness of transit monitoring, Alameda CTC in consultation with the stakeholders, could identify transit performance measures and geographical coverage/granularity that will effectively highlight transit routes in need of improvement. This effort can be coordinated with the countywide Transit Plan.

Transit Transfers: The other crucial component of travel on transit is the delay experienced during transit transfers and reliability of such transfers. Transfers between two buses, between two trains, and between bus/train should be monitored. Through monitoring a sample of key transit transfers, data will be available to understand the performance of the full transit trip from origin to destination, when combined with the transit travel times obtained in the previous step.

OD Comparison: This last task synthesizes the above data to allow for a comparison of performance between modes on a number of key routes (similar to the current OD routes). Auto travel times for segments not within the CMP network may be determined by adding typical travel times from the 511 website or by obtaining additional commercial speed data for these non-CMP roads. The transit mode may be evaluated by adding the travel times of various transit segments and the relevant connection times. Such analysis may also facilitate estimation of reliability and competitiveness of each mode.

This analysis of alternative modes could be undertaken as a part of the next LOS Monitoring Study in 2016, or this effort could be moved to the 2015 Performance Report as it has a stronger focus on alternative modes.

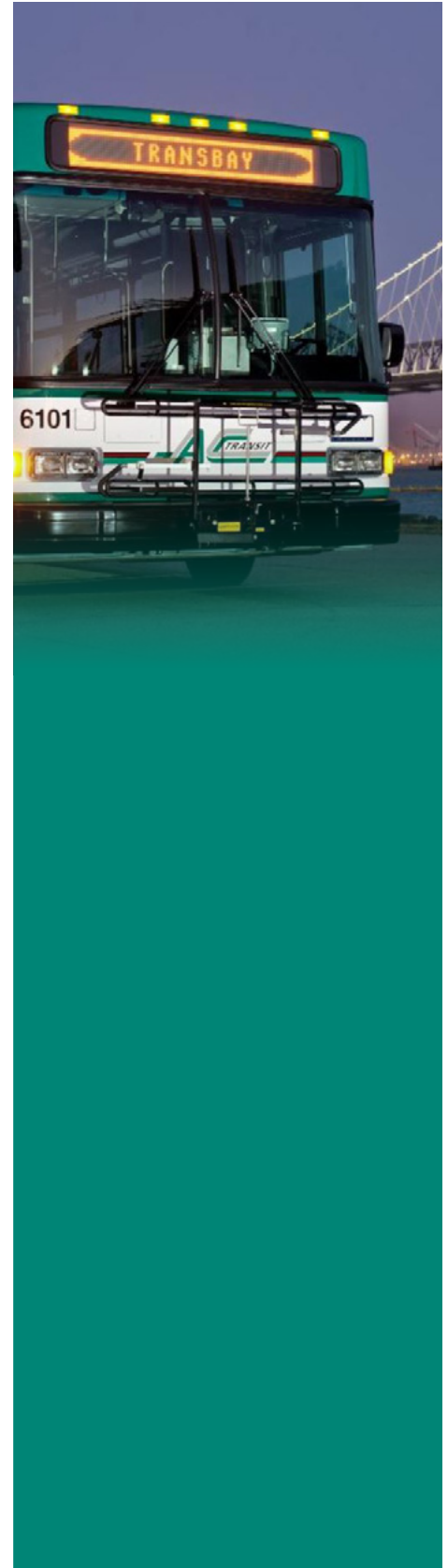
8.4.3 | Refinements to the LOS Monitoring Process

Other refinements to the LOS Monitoring process are discussed below.

CMP Network Updates: Updates to the CMP network should be transferred into the input files prior to subsequent monitoring cycle. These base files include:

- GIS network files;
- Route spreadsheets (if floating car surveys are employed again in 2016); and
- Summary spreadsheets.

Management of Incidents: In 2014 and all previous monitoring cycles, travel time data has not been obtained during incidents. For a floating car methodology, this is reasonable as the sample size is lower and one incident would have a greater impact on the final monitoring result. For commercial data however, the sample size is significantly greater and an individual incident is unlikely to have a large impact on the overall speed, unless there are a lot of incidents. In the latter case, instead of removing data associated with incidents, it would be better to retain it so that the monitoring results reflect the reliability of travel time experienced daily by motorists.



Free Flow Speed Surveys: In the 2014 monitoring cycle, free flow speed surveys were conducted on the arterial (Tier 2) network in order to inform the selection of a HCM arterial class. The arterial class was selected using free flow speed bins of 5-10 mph and other functional/design categories of road such as arterial hierarchy, availability of parking, intersection density, and roadside development. A small minority of surveys recorded questionable results due to limitations in the floating car survey methodology and logistics. Such routes (identified in **Appendix H**) include those impacted by construction work (Dougherty Road, Fremont Boulevard) and routes where the free flow speed was lower than the peak period speed (such as 11th Street, and Tassajara Road). The latter situation may be due to the differences in traffic signal timing between the peak and off peak periods.

Alameda County and cities periodically conduct radar surveys on local streets at mid-block locations. These radar studies may be compared to the 2014 free flow speed results to allow for adjustments to their arterial class as necessary.

8.4.4 | Vision for Future Monitoring

New data technologies and the performance measurement approaches they enable are radically transforming congestion monitoring practice nationwide. These technologies and approaches revolve around the emerging fields of Big Data and Analytics.

New data technologies include:

- **Crowd Sourcing:** The use of mobile devices to enhance traditional monitoring methods;
- **Open Data:** Free provision of data by agencies, in structured formats, for use by stakeholders.

Resulting performance measurement approaches include:

- **Continuous Monitoring:** The ability to monitor congestion continuously, in real-time; and
- **Advanced Metrics:** New metrics are helping agencies understand congestion in new ways;
- **Enhanced Visualization:** Visualization is the core communication medium of Big Data; and
- **Integrated Analytics:** Allowing agencies integrate data into their business processes.

Alameda CTC has taken a major first step in leveraging these new technologies by using crowd-sourced vehicle probe data in its monitoring for the first time in this monitoring cycle. In future years, Alameda CTC may continue to transform its congestion monitoring process by adopting use of new data, and technologies and performance measurement approaches.

Crowd Sourcing: Crowd sourcing for transportation monitoring has emerged over the past decade with the emergence of mobile devices with GPS and cellular connectivity. In the United States, approximately 70% of adults now have smart phones, creating major opportunities for agencies like Alameda CTC to leverage the data from these devices to help them understand and improve the transportation system for all users.

The types of data available (now or in the near future from these devices, in order of decreasing product maturity) include:

- **Speeds:** Link-based, averaged speeds from mobile, the most mature data product;
- **Incidents:** Companies such as Waze are now collecting incidents in real-time;
- **Origin/Destination:** Companies such as AirSage and Streetlight collect historical OD data;
- **Volume:** Companies are working to crowd-source average volumes, similar to link speeds; and
- **Sentiment:** New techniques are available to mine social media for attitudes about services.

With this cycle, Alameda CTC has leveraged speed data from one provider to greatly enhance its monitoring process. Future cycles may extend this use of Big Data by adding additional crowd-sourced data, as they mature into reliable products. This additional integration may begin with incidents and OD data, as early as the next cycle.

Open Data: Open data is a process for freely sharing agency-generated Big Data via standardized formats. Alameda CTC can leverage open data in two ways. First, it can start to share the Big Data that it uses with its member agencies, enhancing their participation in the transportation planning, project development or monitoring processes. Second, it can acquire and use open data from partner agencies to enhance its own monitoring process. Regional agencies such as MTC have made major open data investments, and Alameda CTC can begin to incorporate this data for its own purposes, particularly in the area of transit performance.

Continuous Monitoring: Beyond current biennial monitoring, Alameda CTC may consider development of a web-based, congestion monitoring dashboard to allow for continuous monitoring of all transportation modes in Alameda County. The dashboard may utilize crowd sourced data for the auto mode and 511 data for the transit mode allowing for the display of average speed, LOS and reliability for each CMP segment. Evaluation of conformity would still occur on the same CMP segments in the same time periods as current LOS monitoring. One example of such a dashboard is shown in **Figure 8-2** on the next page.

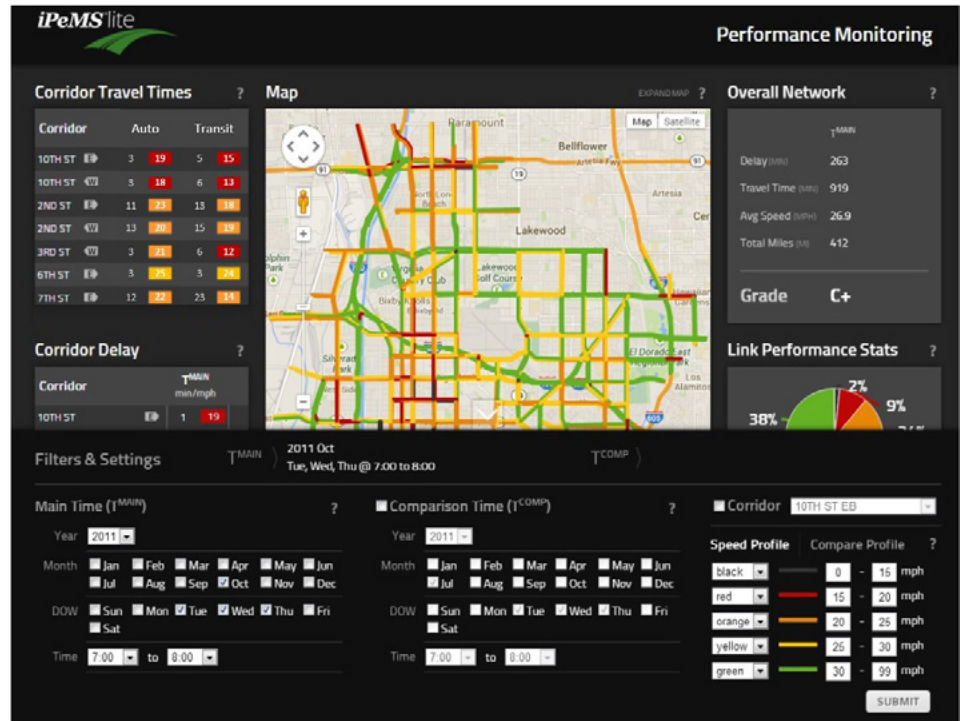


Figure 8-2: Example Dashboard

The dashboard could display trends from one monitoring cycle to another, and trends across all months of the year or days of the week. This dashboard may be used as an interactive report allowing member agencies of Alameda CTC to query information useful to them.

Advanced Metrics: Traditional congestion monitoring has focused on average speeds and travel times, to characterize the travel experience throughout areas like Alameda County. Experience has shown that a major component of the travel experience is the reliability of the travel times, rather than just the average. Increasingly, the transportation industry is moving to focus on travel time reliability and also there are policy requirements such as MAP-21 that would need agencies like Alameda CTC to begin to monitor the reliability of travel time, in addition to the average travel time. While traditional techniques have made this difficult, Big Data technologies may allow Alameda CTC to track travel time reliability, in addition to average experience, on most of the major corridors in Alameda County.

Enhanced Visualization: Text has served as the core communication for congestion monitoring, largely in the form of tables in reports. However, the core communication medium for Big Data is not text, it is visualization. The visualization example in **Figure 8-3** shows the average reliability of a particular route through Alameda County over a three-month period, by five-minute intervals, throughout the day. The reliability is visualized in a polar chart, as a probability distribution

function, with lower travel times toward the center of the circle, higher travel times further out, and frequency each time occurred on the vertical (Z) axis. This congestion fingerprint shows how reliability is high during the overnight and mid-day hours, where the travel times bunch vertically near free flow. It also shows, in detail, where the travel times flatten and move outward during peak periods, demonstrating both increasing congestion and lack of reliability.

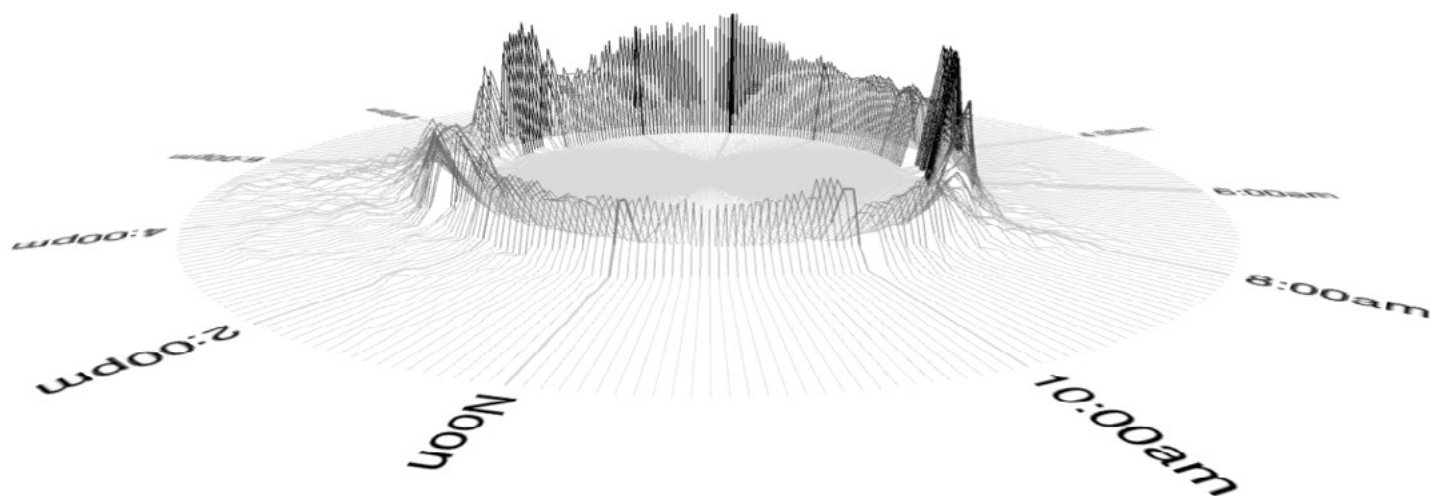
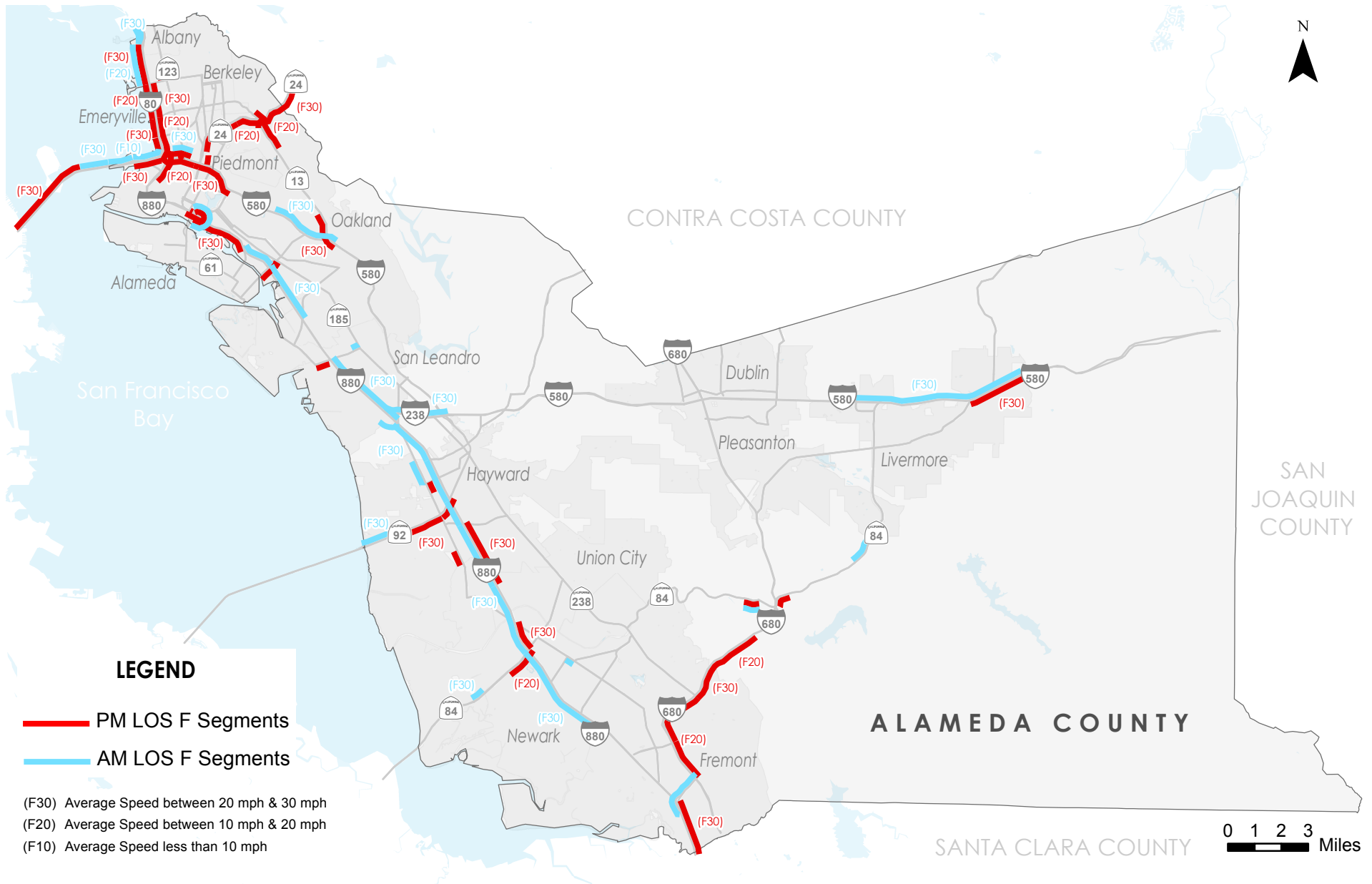


Figure 8-3: Example Visualization of Reliability of a Route (Oakland to San Jose via I-880, I-238, I-580, I-680)

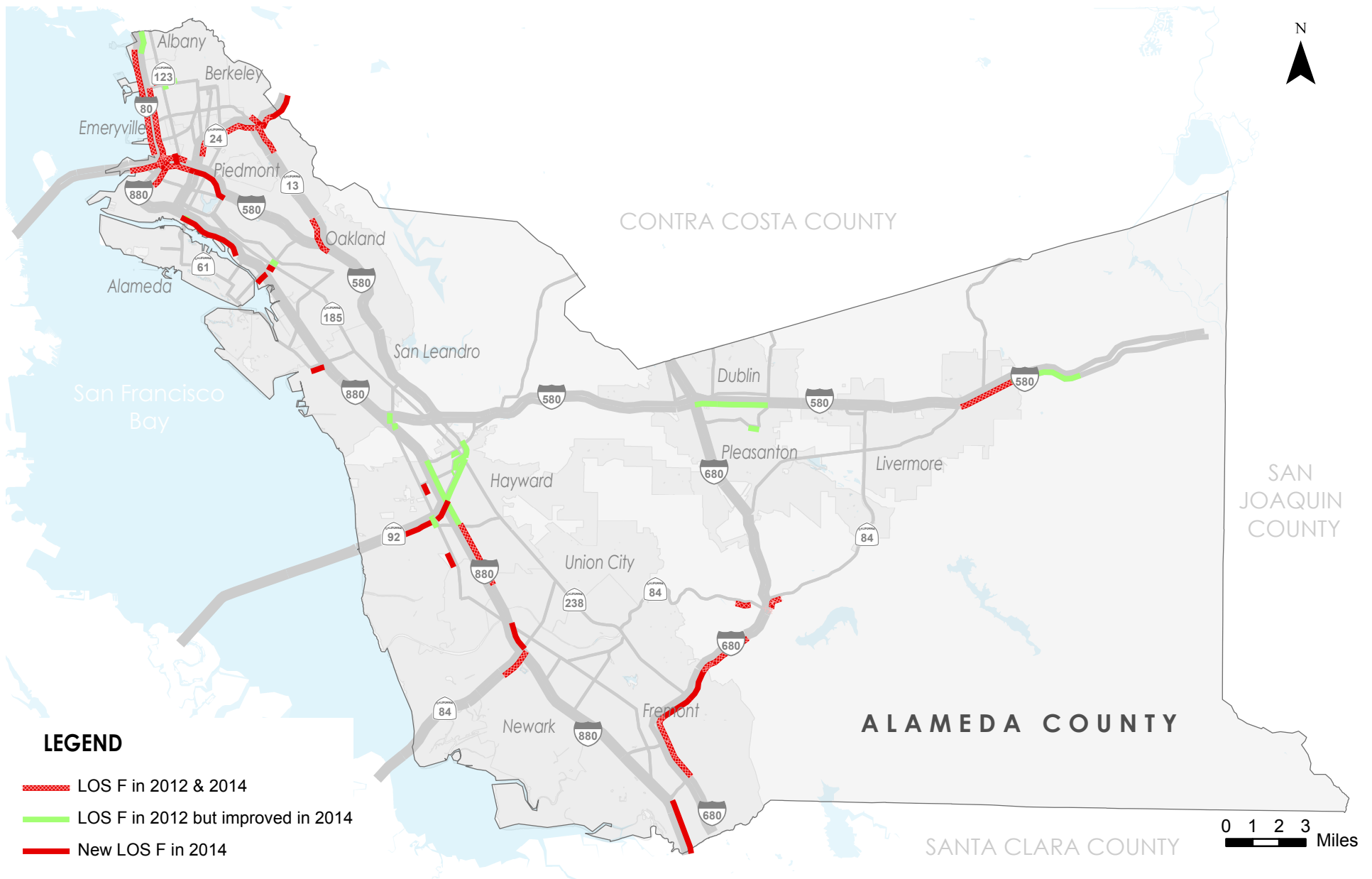
This visualization gives an example of the instant explanatory power now available via Big Data. Someone who understands how to read this chart can quickly obtain an understanding of the congestion along this route; an understanding that is both sweeping in its scope and precise in its detail. Attempting to characterize this level of information in text would take pages and pages of writing. Now that Alameda CTC has begun to tap into Big Data sources, Alameda CTC may consider investing more of its resources to find ways to effectively visualize that data, using advanced analytics techniques.

Integrated Analytics: One of the core imperatives of the new Performance-Based Planning Process that MAP-21 will help agencies implement is the ability to integrate congestion monitoring into a larger planning and programming process. The long term vision for agencies like Alameda CTC that have built a sophisticated congestion monitoring infrastructure is to move from periodic reporting to a continuous monitoring approach, deeply integrated into Alameda CTC's business processes. This integration will require changes to the ways in which Alameda CTC uses data to make decisions about project selection and evaluation. To achieve this, Alameda CTC staff will need to someday find ways to use its analytics tools as part of their daily process. Nationally, agencies that have developed these tools are beginning to modify their fundamental business processes, in order to fully leverage the new information from them. Alameda CTC may consider ways to begin this change towards adopting Big Data and analytics as integral part of Alameda CTC's planning and monitoring.

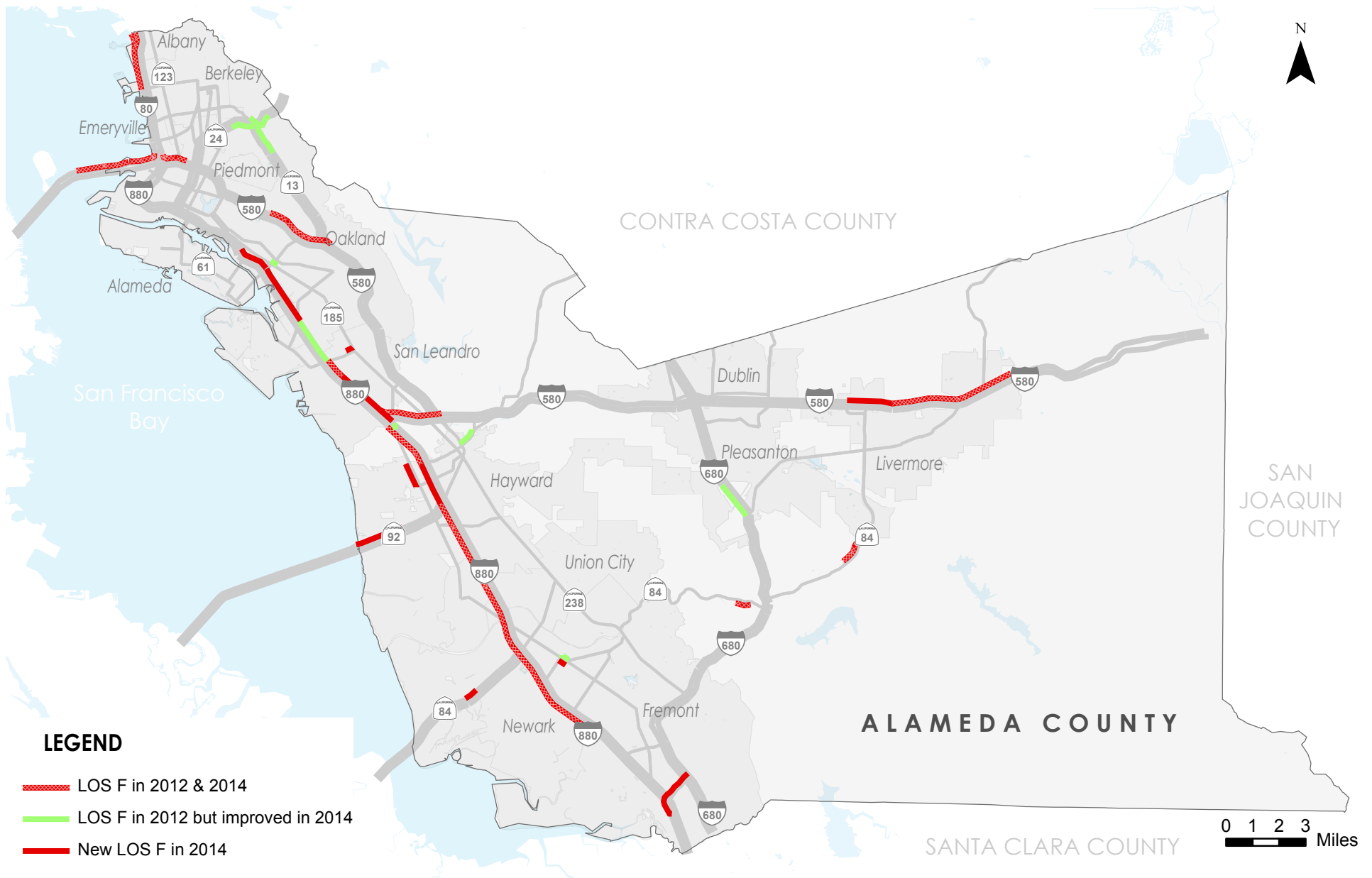
Appendix A. 2014 Level of Service Maps



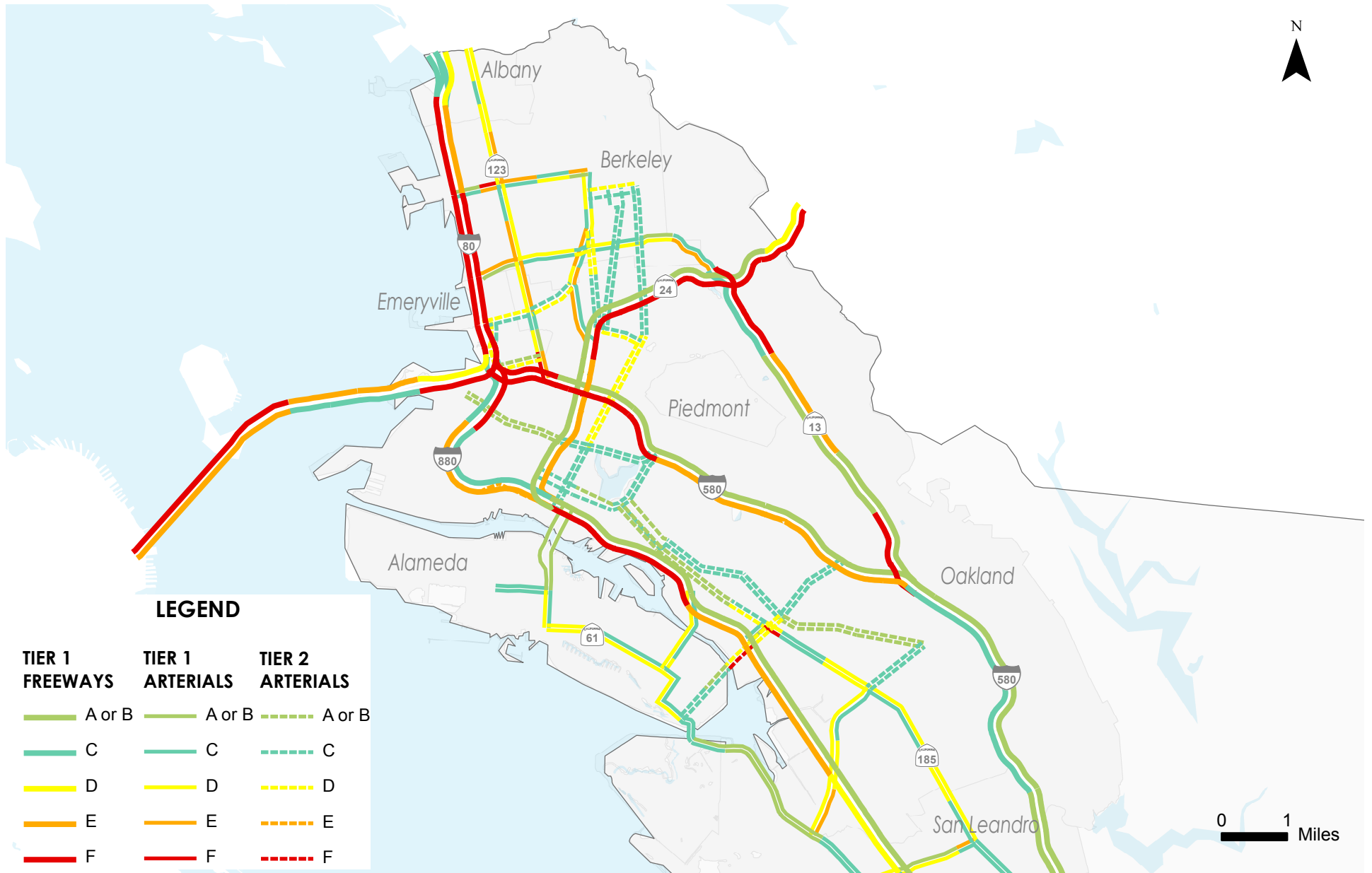
2014 LEVEL OF SERVICE MONITORING RESULTS: LOS F SEGMENTS - AM & PM PEAK PERIODS



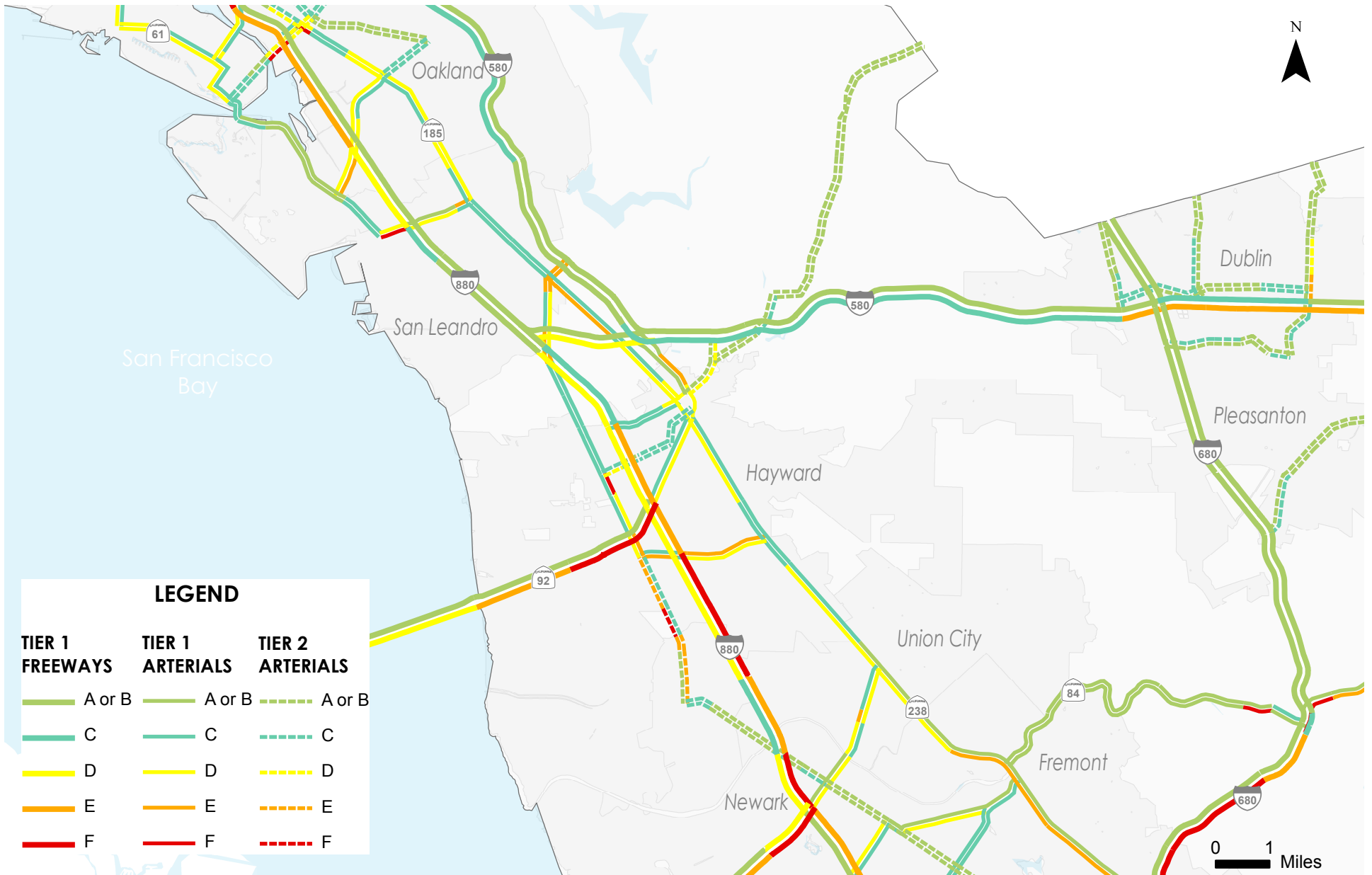
2014 LEVEL OF SERVICE MONITORING RESULTS: CHANGE IN LOS F FROM 2012 TO 2014 - PM PEAK PERIOD



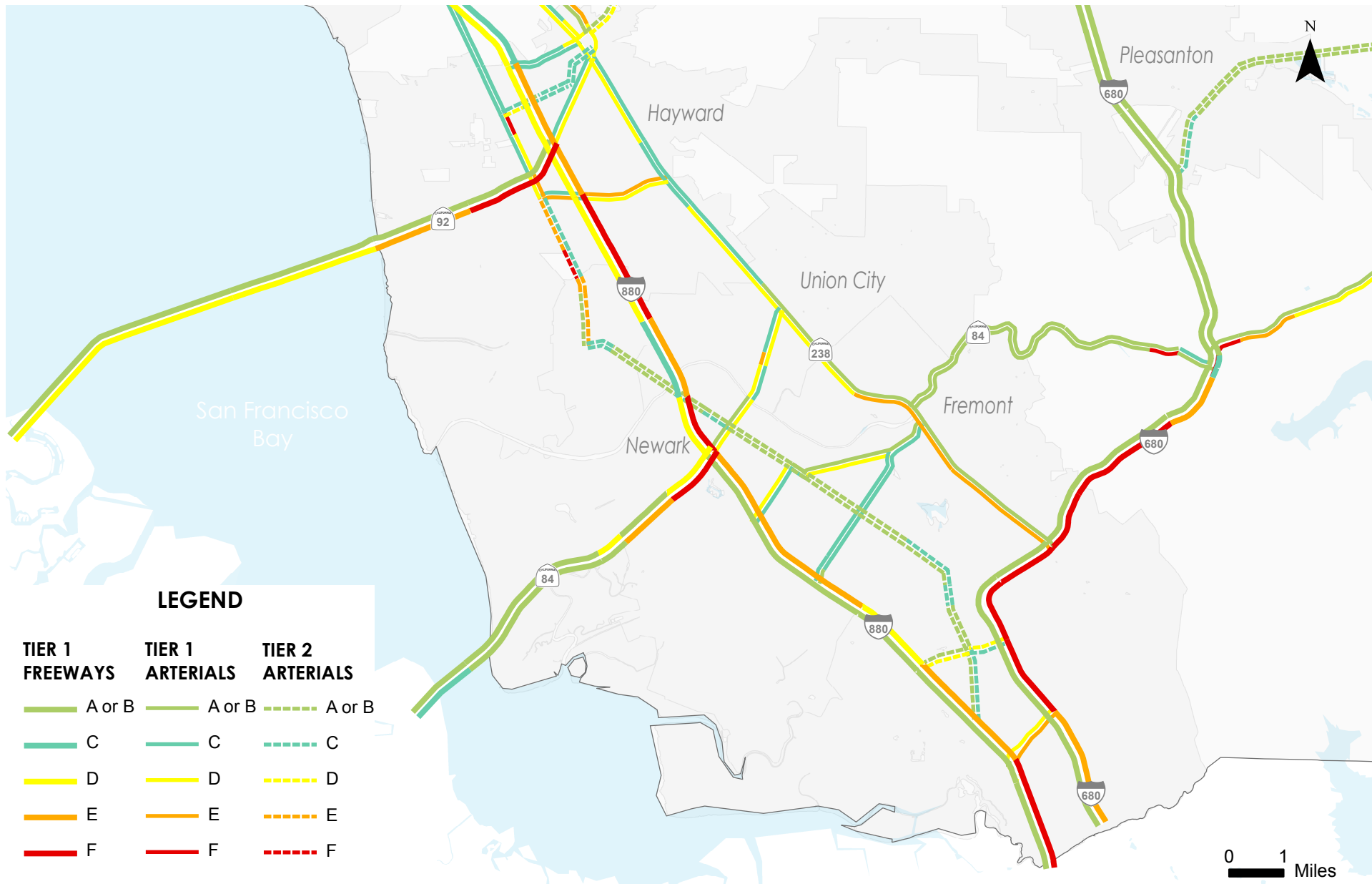
2014 LEVEL OF SERVICE MONITORING RESULTS: CHANGE IN LOS F FROM 2012 TO 2014 - AM PEAK PERIOD



**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (NORTH) - PM PEAK PERIOD (4:00 PM to 6:00 PM)**

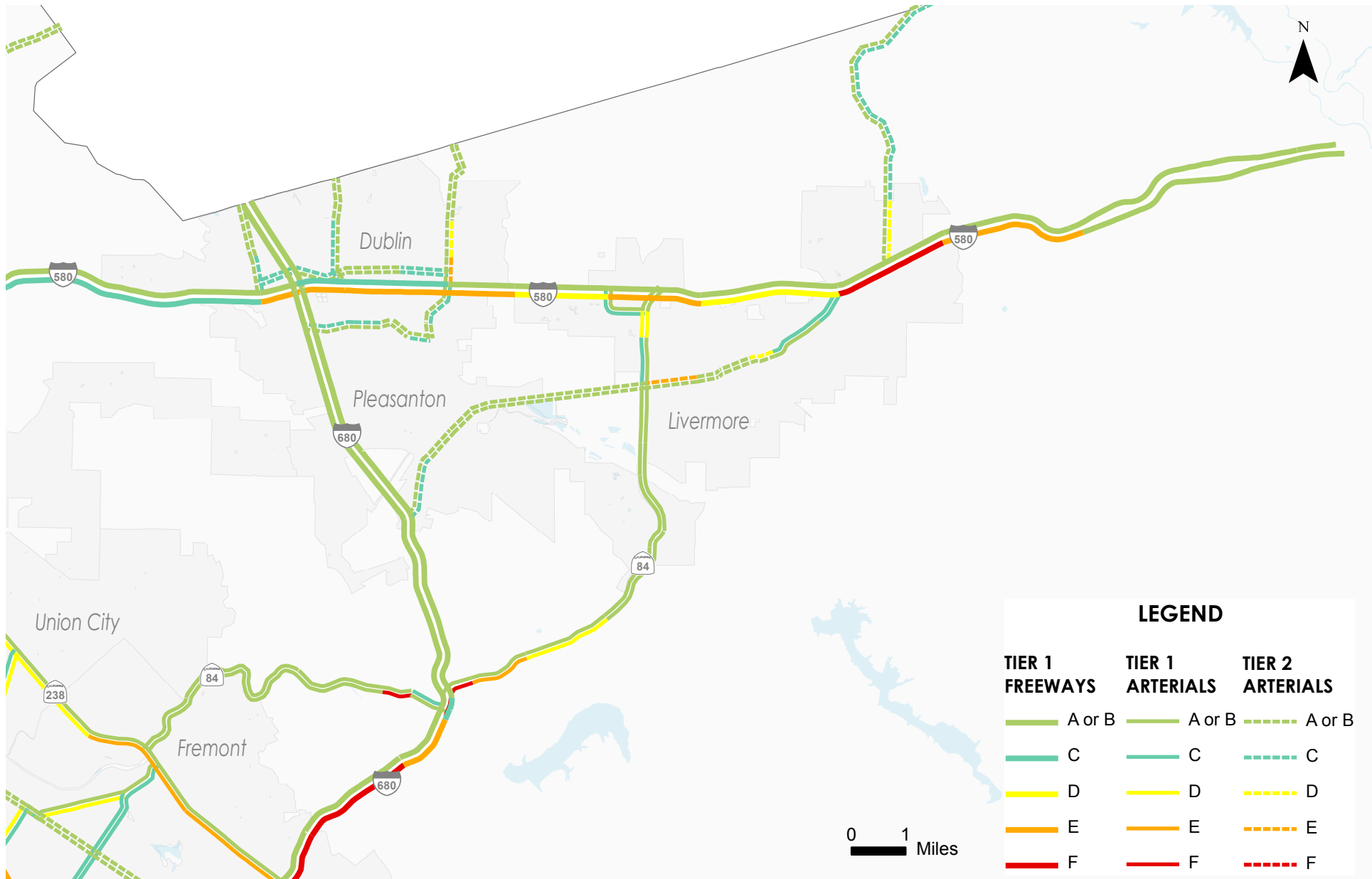


2014 LEVEL OF SERVICE MONITORING RESULTS: PLANNING AREA (CENTRAL) - PM PEAK PERIOD (4:00 PM to 6:00 PM)

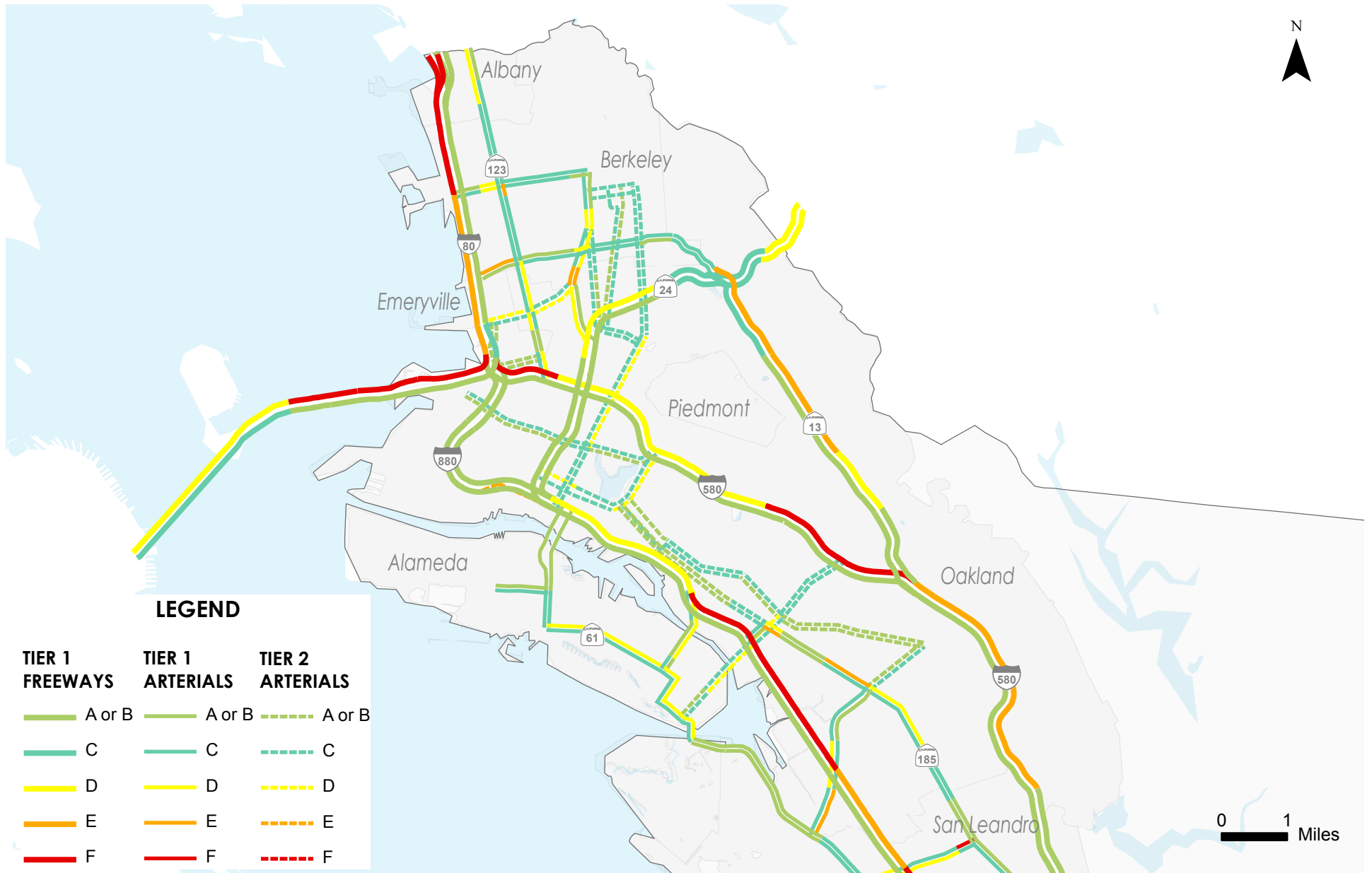


**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (SOUTH) - PM PEAK PERIOD (4:00 PM to 6:00 PM)**

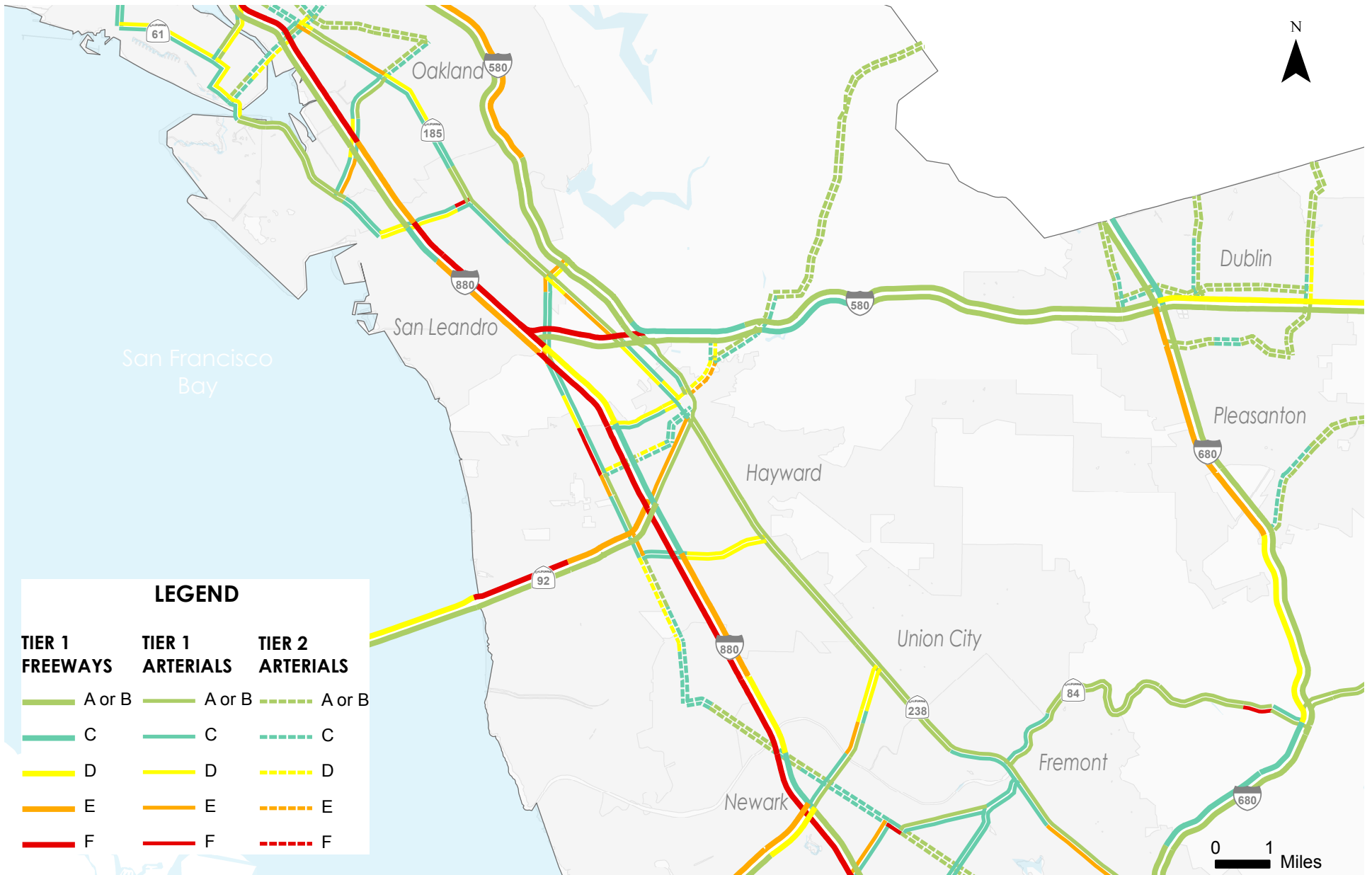




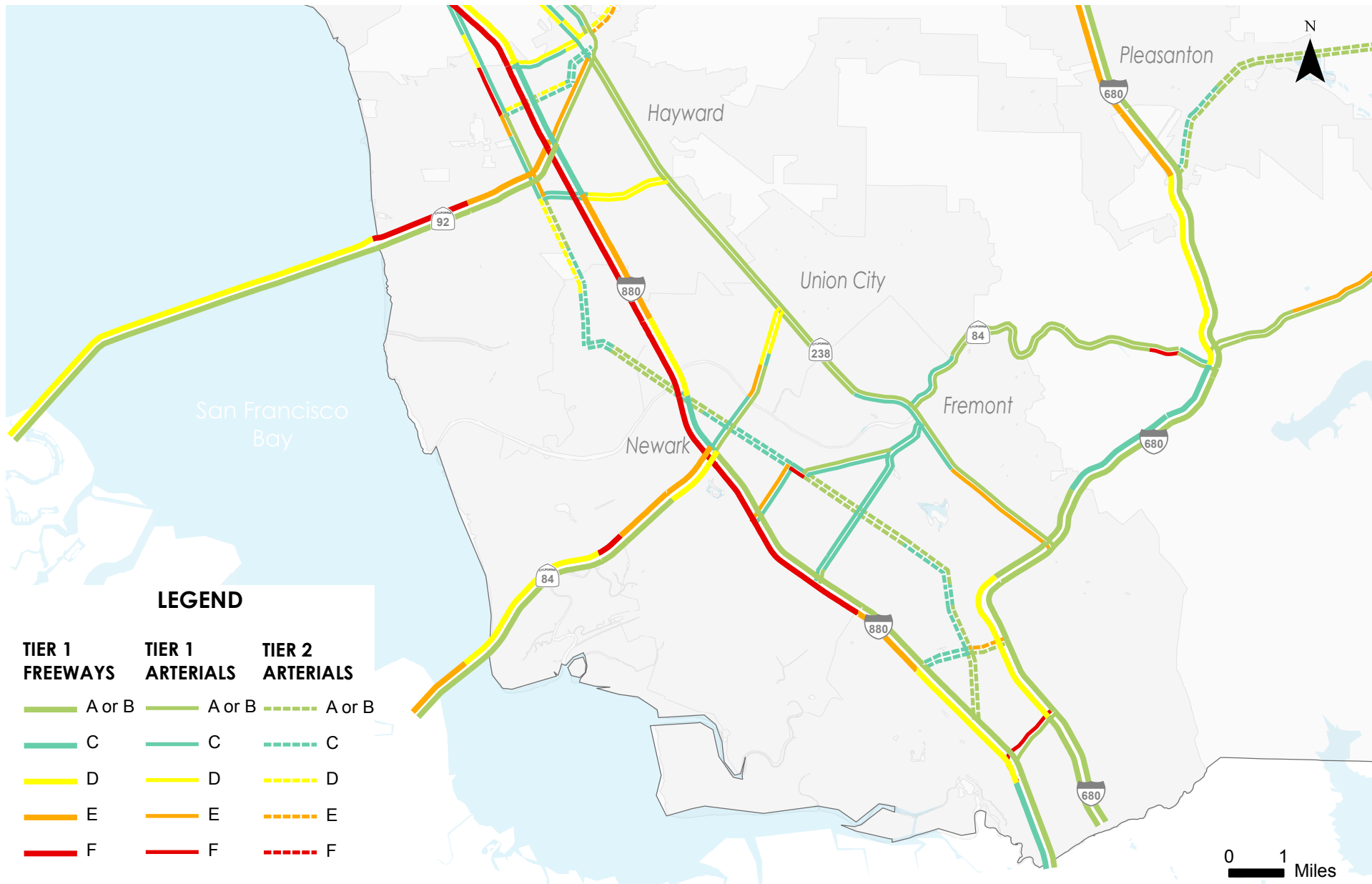
**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (EAST) - PM PEAK PERIOD (4:00 PM to 6:00 PM)**



**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (NORTH) - AM PEAK PERIOD (7:00 AM to 9:00 AM)**

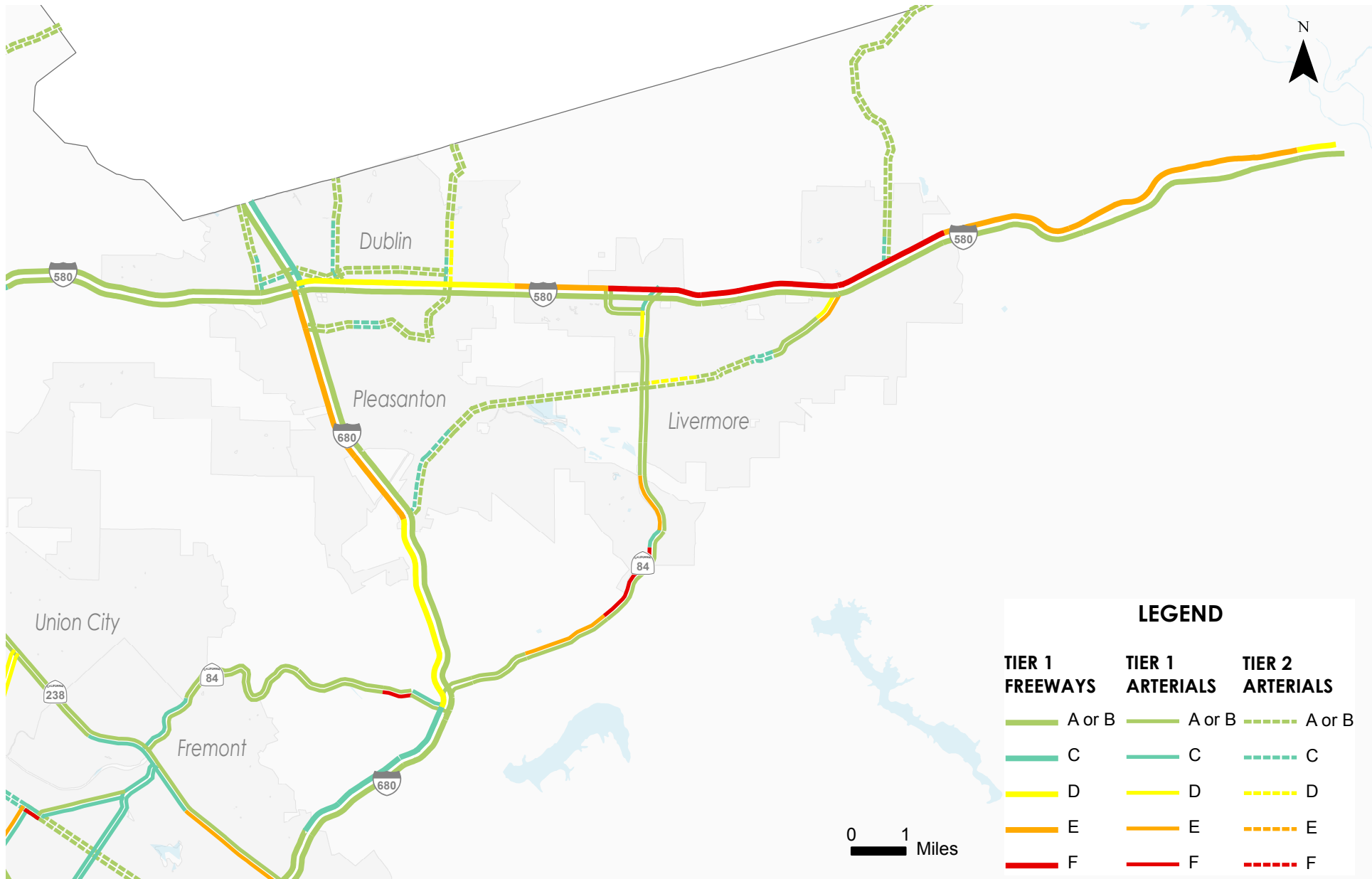


**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (CENTRAL) - AM PEAK PERIOD (7:00 AM to 9:00 AM)**



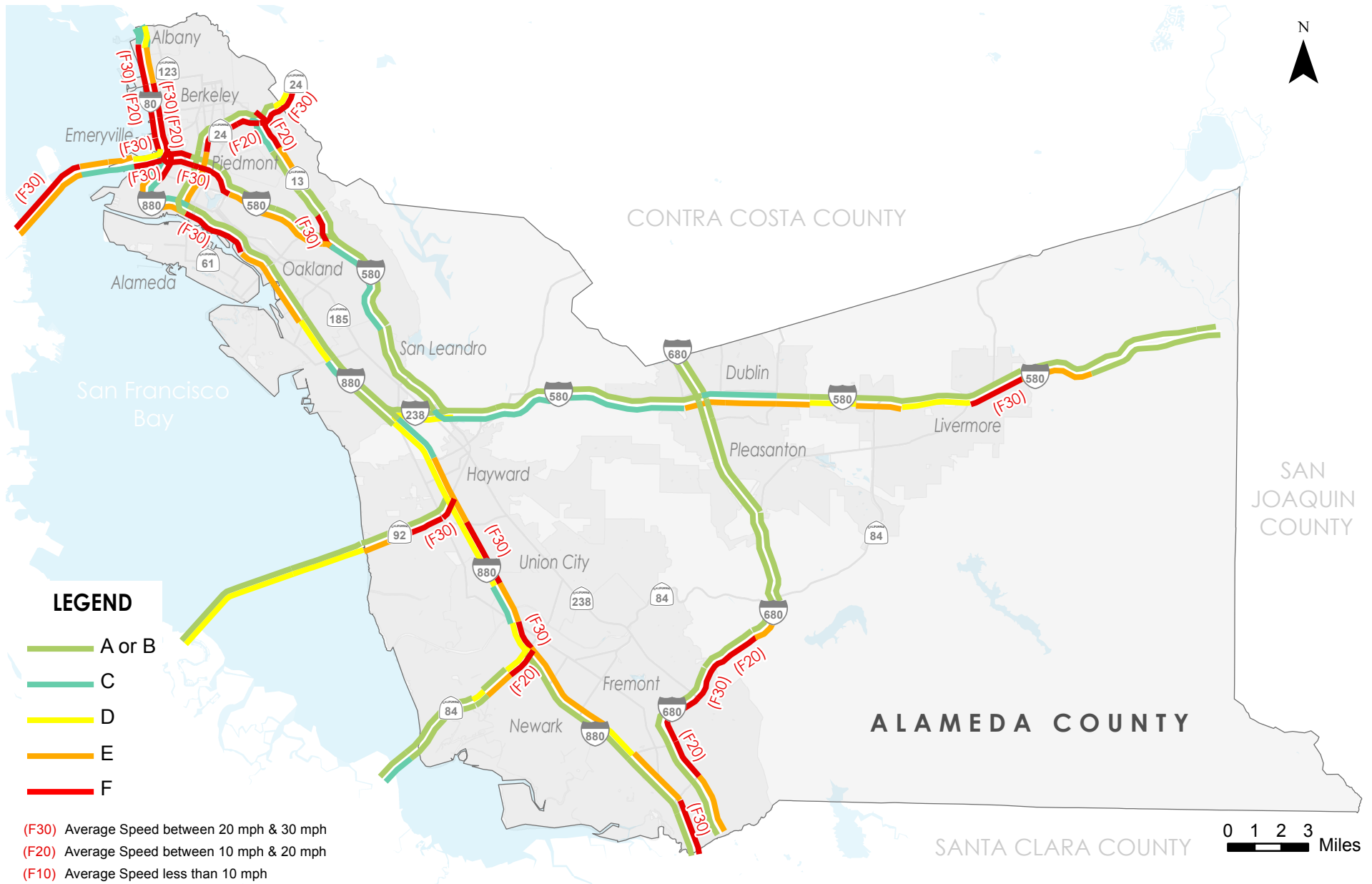
**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (SOUTH) - AM PEAK PERIOD (7:00 AM to 9:00 AM)**





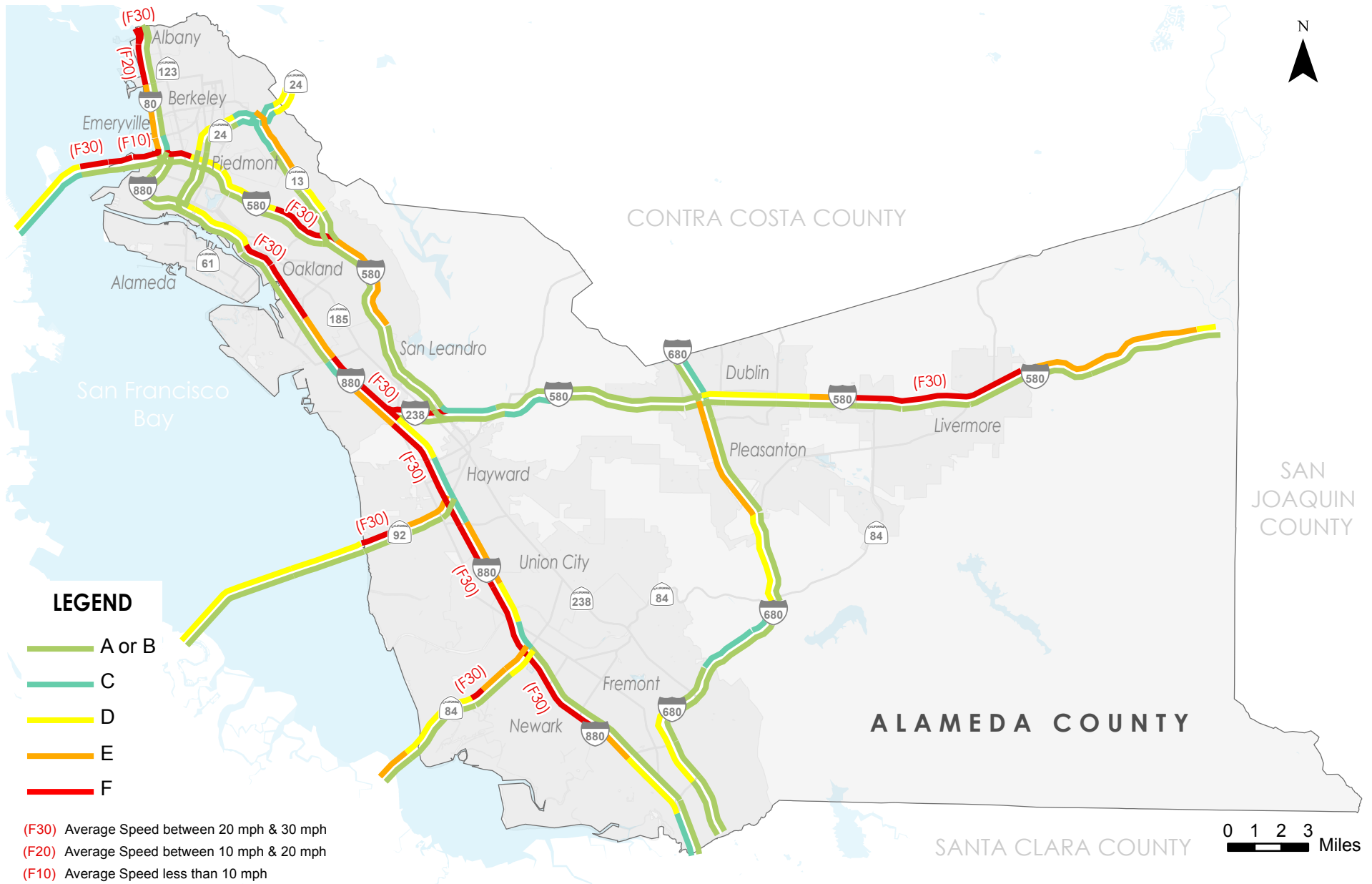
**2014 LEVEL OF SERVICE MONITORING RESULTS:
PLANNING AREA (EAST) - AM PEAK PERIOD (7:00 AM to 9:00 AM)**





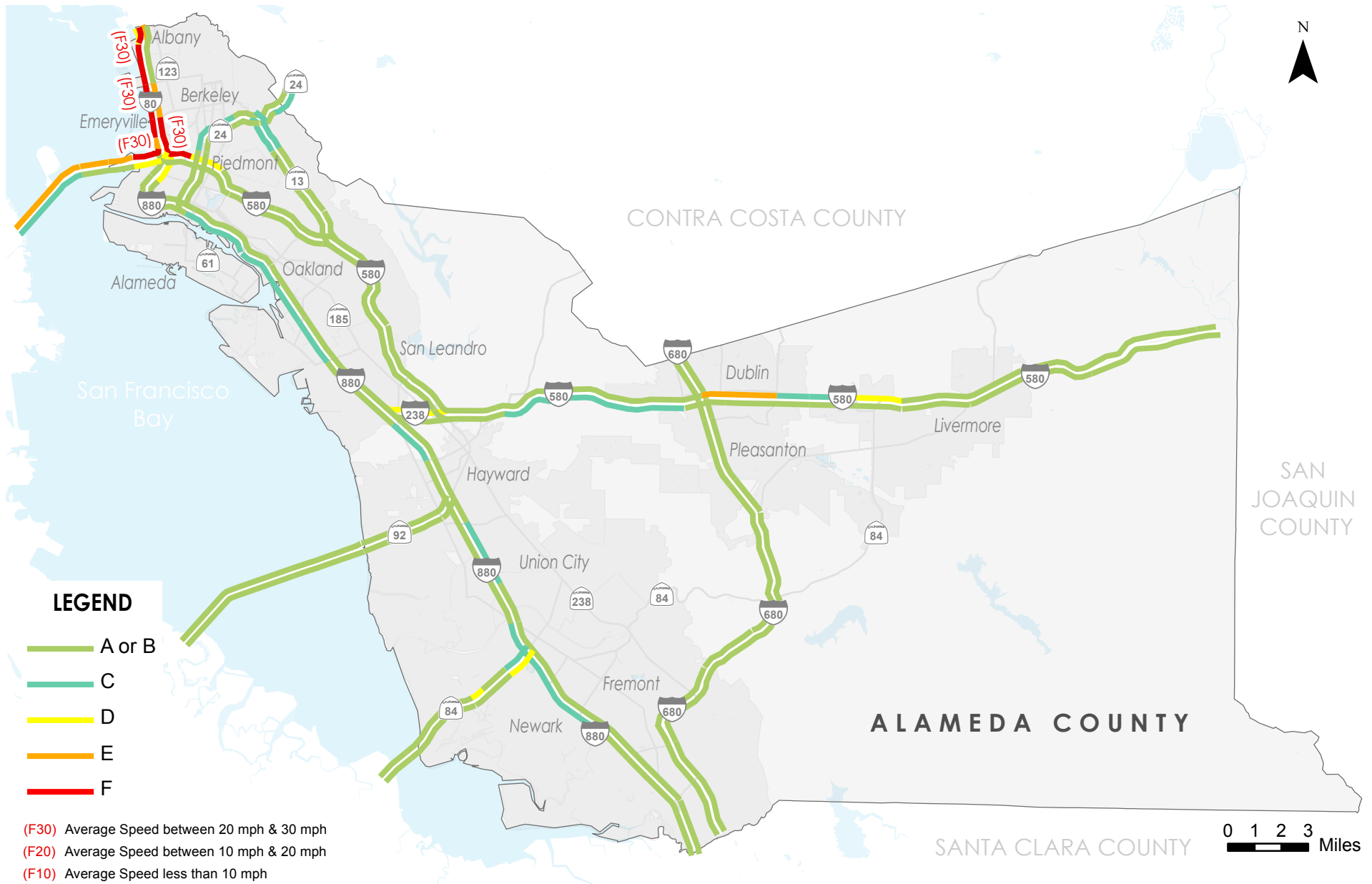
2014 LEVEL OF SERVICE MONITORING RESULTS: TIER 1 FREEWAYS & BRIDGES - PM PEAK PERIOD



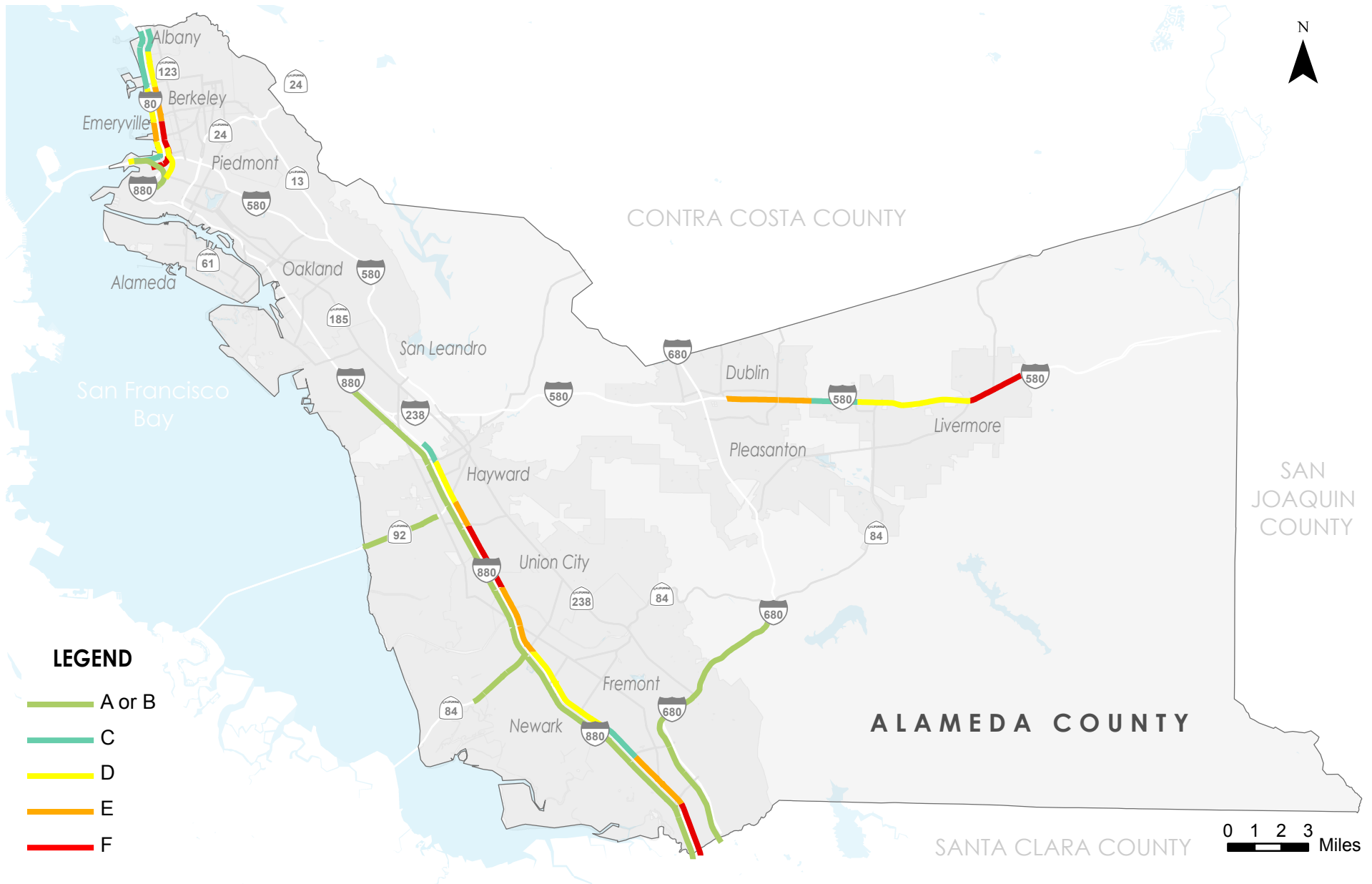


2014 LEVEL OF SERVICE MONITORING RESULTS: TIER 1 FREEWAYS & BRIDGES - AM PEAK PERIOD

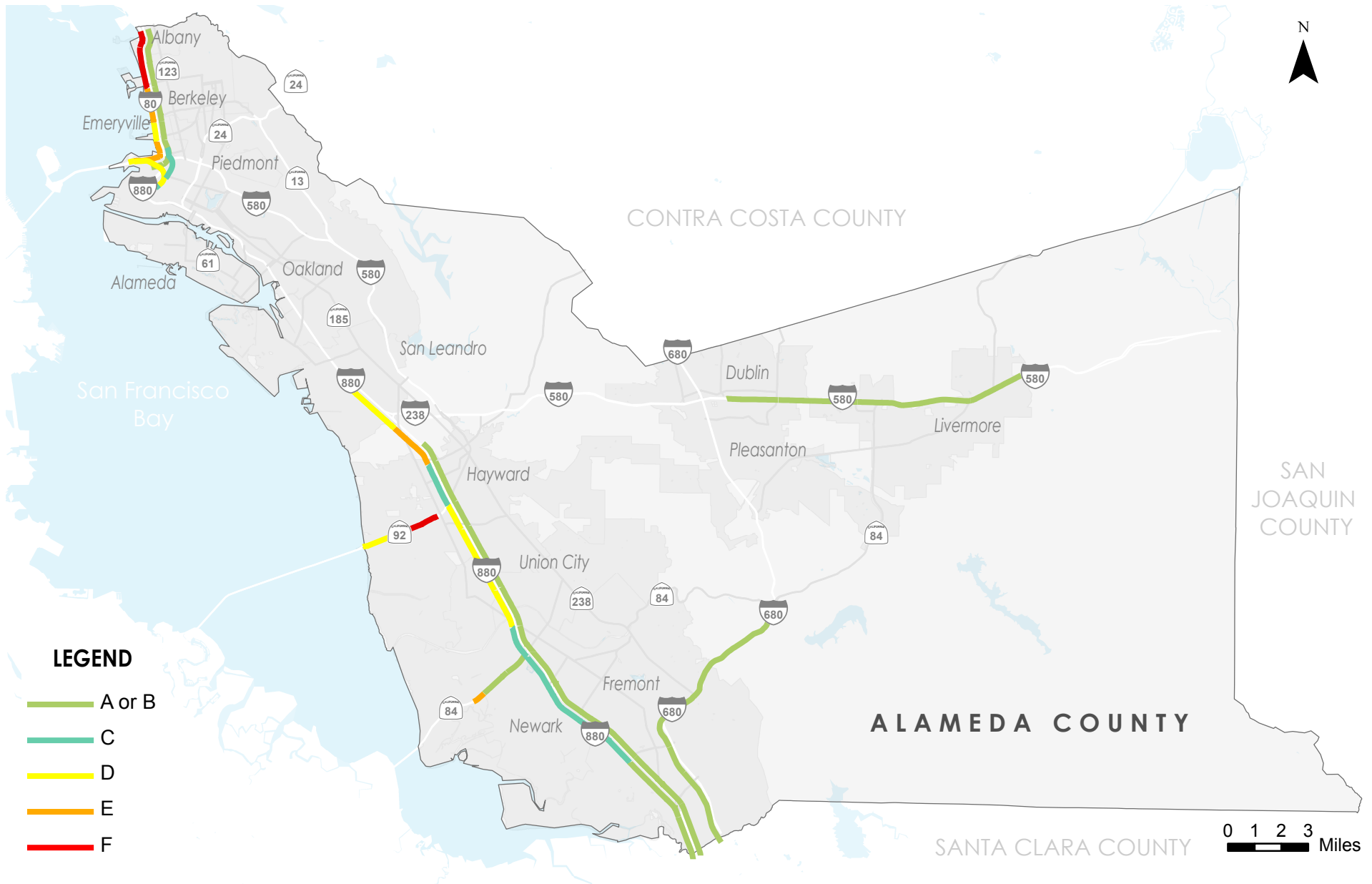




2014 LEVEL OF SERVICE MONITORING RESULTS: TIER 1 FREEWAYS & BRIDGES - WEEKEND



**2014 LEVEL OF SERVICE MONITORING RESULTS:
HOV & EXPRESS LANES - PM PEAK PERIOD**



**2014 LEVEL OF SERVICE MONITORING RESULTS:
HOV & EXPRESS LANES - AM PEAK PERIOD**

Appendix B. 2014 Level of Service Results

This Appendix shows the results for all CMP segments. Tables are included for freeways (Tier 1), ramps (Tier 1), arterials (Tier 1 & 2), HOV/express lanes and bridges for the afternoon, morning and weekend monitoring periods as appropriate. Table notes below each table correspond to numbers in the Notes column and should be looked up as appropriate.

The following abbreviations are used for jurisdictions in Alameda County:

Ala – Alameda	Dub – Dublin	Hay – Hayward	Oak – Oakland	Uni Cty – Union City
Alb – Albany	Emery – Emeryville	Liv – Livermore	Plea – Pleasanton	Uninc – Unincorporated
Berk – Berkeley	Fre – Fremont	New – Newark	San L – San Leandro	

The abbreviations for other jurisdictions are:

SM – San Mateo	SF – San Francisco
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The abbreviations for Plan Areas are:

N – North	C – Central
S – South	E – East

B.1 | Freeways (Tier 1)

Table B-1: 2014 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F1	I-80 - EB	SF County Line	Toll Plaza	Oak	2.01	N	5	7	49.9	C	3779	53.9	C	
F2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1.3	N	6	7	25.4	(F30)	3779	24.7	(F30)	
F3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery	0.54	N	6	7	13.05	(F20)	2833	12.1	(F20)	
F4	I-80 - EB	Powell	Ashby	Emery, Berk	0.72	N	6	7	12.29	(F20)	2833	13.4	(F20)	
F5	I-80 - EB	Ashby	University	Berk	1.3	N	5	7	25.72	(F30)	2833	23.5	(F30)	
F6	I-80 - EB	University	Jct I-580 (off)	Berk, Alb	1.37	N	5	7	33.5	E	2948	34.7	E	
F7	I-80 - EB	Jct I-580 (off)	Central (County line)	Alb	0.84	N	4	7	27.7	(F30)	2835	48.1	D	[2]
F8	I-80 - WB	Central (County line)	Jct I-580	Alb	0.7	N	4	6	52.0	C	3185	54.7	C	
F9	I-80 - WB	Jct I-580	University	Berk, Alb	1.51	N	6	6	28.7	(F30)	2948	26.7	(F30)	
F10	I-80 - WB	University	Ashby	Berk	1.31	N	5	6	23.3	(F30)	2714	18.8	(F20)	
F11	I-80 - WB	Ashby	Powell	Emery	0.71	N	5	6	15.5	(F20)	2635	15.4	(F20)	
F12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery	0.47	N	6	6	28.0	(F30)	2377	28.3	(F30)	
F13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1.31	N	8	6	39.4	E	3208	41.0	D	

Table B-1: 2014 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F14	I-80 - WB	Toll Plaza	SF County	Oak	2.01	N	4	6	40.9	E	3777	37.5	E	
F15	I-238 - EB	I-880	I-580	Uninc, San L	2.59	C	3	6	38.7	E	2477	44.9	D	
F16	I-238 - WB	I-580	I-880	Uninc, San L	2.48	C	3	7	52.1	C	2454	56.5	B	
F17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Uninc	2.68	C	5	7	51.1	C	3182	49.9	C	
F18	I-580 EB	Grove	Eden Canyon	Uninc, Plea	2.19	E	4	7	54.3	C	3540	49.6	C	
F19	I-580 EB	Eden Canyon	San Ramon/Foothill	Uninc, Plea	4.82	E	4	7	48.0	D	3067	50.4	C	
F20	I-580 EB	San Ramon/Foothill	I-680	Plea	0.71	E	4	7	33.2	E	3662	35.4	E	
F21	I-580 EB	I-680	Hopyard	Plea	0.87	E	6	8	24.6	(F30)	3430	30.1	E	
F22	I-580 EB	Hopyard	Santa Rita	Plea	1.9	E	6	8	26.2	(F30)	3073	31.3	E	[1]
F23	I-580 EB	Santa Rita	El Charro	Uninc, Plea	1.25	E	6	8	34.1	E	3900	38.7	E	[1]
F24	I-580 EB	El Charro	SR 84/Airway Blvd.	Uninc	1.72	E	6	8	56.1	B	3543	45.2	D	[1] [2]
F25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	1.73	E	5	9	61.0	A	3900	40.1	E	[1]
F26	I-580 - EB	Portola	1st St	Liv	2.56	E	5	9	65.0	A	3424	41.4	D	[1] [2]
F27	I-580 - EB	1st St	Greenville	Liv	2.13	E	6	9	29.3	(F30)	2829	22.2	(F30)	[1] [2]
F28	I-580 - EB	Greenville	N.Flynn	Uninc	2.73	E	4	9	25.4	(F30)	3779	36.8	E	[1] [2]
F29	I-580 - EB	N.Flynn	Grant Line	Uninc	4.32	E	4	9	39.6	E	3426	59.0	B	[2]
F30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	0.87	E	5	9	37.8	E	3778	58.3	B	[2]
F31	I-580 - WB	I-205 (SJ Co)	Grant Line	Uninc	0.72	E	5	6	37.1	E	3259	66.3	A	[2]
F32	I-580 - WB	Grant Line	N Flynn	Uninc	4.59	E	4	6	69.0	A	3307	65.7	A	
F33	I-580 - WB	N Flynn	Greenville Rd	Liv, Uninc	2.43	E	5	6	68.0	A	3780	67.5	A	
F34	I-580 - WB	Greenville Rd	1st St	Liv	2.21	E	4	6	66.2	A	3779	67.2	A	
F35	I-580 - WB	1st St	Portola Ave	Liv	2.56	E	4	6	63.4	A	3895	66.5	A	[1]
F36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	1.73	E	4	6	69.6	A	3779	65.3	A	[1]
F37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv, Uninc	1.73	E	4	6	68.4	A	3900	64.7	A	[1]
F38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	1.23	E	4	6	61.3	A	3900	59.4	B	[1]
F39	I-580 - WB	Tassajara Rd	I-680	Plea	2.78	E	4	6	62.1	A	3305	49.7	C	
F40	I-580 - WB	I-680	San Ramon Rd	Plea	0.71	E	4	6	62.9	A	3543	58.9	B	
F41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea, Uninc	4.82	E	4	6	62.4	A	3305	62.8	A	
F42	I-580 - WB	Eden Canyon	Center St	Uninc	2.5	E	4	6	67.8	A	3541	66.0	A	
F43	I-580 - WB	Center	I-580/238	Uninc	2.26	C	5	6	57.4	B	3660	64.9	A	

Appendix B. 2014 Level of Service Results

Table B-1: 2014 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F44	I-580 - EB	I-80	I-980	Oak	1.27	N	5	6	18.6	(F20)	3658	24.4	(F30)	
F45	I-580 - EB	I-980	Harrison	Oak	1.02	N	5	6	30.1	E	3545	24.2	(F30)	
F46	I-580 - EB	Harrison	Lakeshore	Oak	0.84	N	4	6	31.2	E	3664	25.7	(F30)	
F47	I-580 - EB	Lakeshore	Coolidge	Oak	2.21	N	5	6	43.7	D	3541	33.0	E	
F48	I-580 - EB	Coolidge	SH 13 Off	Oak	2.2	N	4	6	52.1	C	3414	36.1	E	
F49	I-580 - EB	SH 13 Off	MacArthur	Oak	4.08	N	4	6	42.4	D	3654	54.8	C	
F50	I-580 - EB	MacArthur	I-580/238	San L, Uninc	3.78	C	4	6	66.6	A	3538	67.0	A	
F51	I-580 - WB	I-238	Foothill/MacArthur	Uninc	3.86	C	4	6	71.0	A	3729	68.4	A	
F52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak	4.04	N	4	6	64.0	A	3644	65.8	A	
F53	I-580 - WB	SH 13 Off	Fruitvale	Oak	2.63	N	4	6	60.8	A	3619	67.5	A	
F54	I-580 - WB	Fruitvale	Harrison	Oak	2.68	N	4	6	55.0	C	3515	64.6	A	
F55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1.24	N	5	6	53.0	C	3541	59.2	B	
F56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1.17	N	5	6	14.2	(F20)	3777	29.3	(F30)	[2]
F57	I-580 - EB	Central (County Line)	I-80 Jct	Alb	0.7	N	2	6	46.3	D	8	53.5	C	
F58	I-580 - WB	I-80 Jct	Central (County Line)	Alb	0.86	N	3	6	66.6	A	8	52.5	C	
F59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	2.26	S	3	7	51.4	C	3664	36.6	E	
F60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	1.62	S	3	7	20.1	(F30)	3308	12.9	(F20)	
F61	I-680 - NB	Durham Rd	Washington Blvd	Fre	1.3	S	3	7	23.4	(F30)	3437	11.9	(F20)	[2]
F62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	1.14	S	3	7	38.7	E	3437	19.2	(F20)	[2]
F63	I-680 NB	SR 238/Mission	Vargas Rd	Fre	1.1	S	4	7	53.7	C	3781	24.0	(F30)	[2]
F64	I-680 NB	Vargas Rd	Andrade Rd	Uninc	2.21	S	4	7	28.9	(F30)	3545	19.8	(F20)	
F65	I-680 NB	Andrade Rd	Calaveras	Uninc	1.15	S	3	7	39.3	E	3664	30.5	E	
F66	I-680 NB	Calaveras	Rt.84/Vallecitos	Uninc	0.39	S	3	6	63.7	A	3783	51.9	C	
F67	I-680 NB	SR 84	Sunol Blvd	Plea, Uninc	3.52	E	3	6	64.7	A	3895	66.6	A	
F68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea, Uninc	1.49	E	3	6	62.5	A	3898	65.0	A	
F69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	2.53	E	3	6	60.8	A	3898	63.1	A	
F70	I-680 NB	Stoneridge Dr	I-580	Plea	0.74	E	4	6	63.4	A	3900	61.9	A	
F71	I-680 - NB	I-580	Alcosta	Dub	1.85	E	4	6	55.8	B	3900	64.7	A	
F72	I-680 - SB	Alcosta	I-580	Dub	1.85	E	5	6	68.8	A	3787	67.5	A	
F73	I-680 SB	I-580	Stoneridge Dr	Plea	0.73	E	4	6	62.2	A	3781	59.4	B	

Table B-1: 2014 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F74	I-680 SB	Stoneridge Dr	Bernal	Plea	2.54	E	3	6	65.4	A	3774	65.9	A	
F75	I-680 SB	Bernal Ave.	Sunol Blvd	Uninc	1.49	E	3	6	59.7	B	3767	66.9	A	
F76	I-680 SB	Sunol Blvd.	SR 84	Uninc	3.71	E	3	6	67.8	A	3769	67.4	A	
F77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Uninc	1.33	S	4	6	65.4	A	3779	67.3	A	
F78	I-680 SB	Andrade Rd	Sheridon Rd	Uninc	1.4	S	5	6	61.9	A	3895	62.2	A	
F79	I-680 SB	Sheridon Rd	Vargas Rd	Uninc	0.81	S	4	6	63.9	A	3895	65.7	A	
F80	I-680 SB	Vargas Rd	SR 238/Mission	Fre	1.11	S	4	6	63.7	A	3778	69.9	A	
F81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	1.14	S	4	6	64.0	A	3783	69.3	A	
F82	I-680 - SB	Washington Blvd	Durham Rd	Fre	1.35	S	4	6	67.6	A	3783	68.7	A	
F83	I-680 - SB	Durham Rd	Rt 262/Mission	Fre	1.63	S	4	6	70.6	A	3664	67.0	A	
F84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	2.25	S	4	6	64.4	A	3545	68.3	A	
F85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	2.09	S	6	8	32.9	E	3307	25.8	(F30)	
F86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	2.43	S	4	8	46.8	D	3307	36.1	E	[1]
F87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	1.53	S	4	8	50.2	C	3545	44.8	D	
F88	I-880 - NB	Stevenson	Decoto	Fre	4.06	S	4	8	56.3	B	3307	35.9	E	
F89	I-880 - NB	Decoto	Alvarado Blvd	Fre	1.17	S	4	8	42.8	D	3309	28.8	(F30)	
F90	I-880 - NB	Alvarado Blvd	Alvarado-Niles Blvd	Fre, Uni Cty	1.57	S	4	8	39.2	E	3428	31.6	E	
F91	I-880 - NB	Alv-Niles	Tennyson	Uni Cty, Hay	2.6	S	4	8	24.7	(F30)	2714	24.8	(F30)	
F92	I-880 - NB	Tennyson	SR 92	Hay	1.02	C	5	7	19.2	(F20)	3421	34.7	E	
F93	I-880 - NB	SR 92	A St	Hay	1.68	C	5	7	25.5	(F30)	3660	35.9	E	
F94	I-880 - NB	A St	I-238 (Marina before 06)	Uninc	1.95	C	5	7	45.1	D	3779	52.2	C	
F95	I-880 - NB	I-880/I238 (split)	Marina Blvd	San L	2.54	C	5	7	65.8	A	2250	62.6	A	
F96	I-880 - NB	Marina Blvd	SR 112/Davis	San L	0.82	C	4	7	60.9	A	2250	59.0	B	
F97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - San L	1.83	C	4	7	60.5	A	2369	59.2	B	
F98	I-880 - NB	Hegenberger	High/42nd	Oak	2.34	N	4	6	48.5	D	2369	58.7	B	
F99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1.25	N	4	6	58.0	B	2256	59.6	B	
F100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	2.63	N	4	6	61.8	A	2486	59.1	B	
F101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	2.43	N	4	6	63.6	A	3766	55.0	C	
F102	I-880 - NB	I-880/I238 (split)	I-880/I-80 (merge)	Oak	1.44	N	4	6	15.2	(F20)	3765	14.3	(F20)	
F103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1.28	N	4	7	65.0	A	3779	53.3	C	[2]

Appendix B. 2014 Level of Service Results

Table B-1: 2014 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	2.51	N	4	7	72.3	A	3779	32.6	E	[2]
F105	I-880 - SB	I-980	23rd	Oak	2.74	N	5	7	39.5	E	2250	26.5	(F30)	
F106	I-880 - SB	23rd St	High/42nd	Oak	1.1	N	5	7	37.3	E	2488	33.7	E	
F107	I-880 - SB	High/42nd	Hegenberger	Oak	2.36	N	4	7	35.1	E	2250	34.7	E	
F108	I-880 - SB	Hegenberger	SR 112/Davis	Oak, San L	1.82	N	4	7	51.7	C	2488	43.3	D	[1]
F109	I-880 - SB	SR 112/Davis	Marina Blvd	San L	0.82	N	4	7	56.4	B	2369	54.6	C	[1]
F110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak, San L	2.55	N	4	7	63.7	A	2369	56.7	B	[1]
F111	I-880 - SB	I-238 (Marina before 06)	A St	Uninc	1.91	C	5	7	53.9	C	3660	47.1	D	
F112	I-880 - SB	A St	Rt 92	Hay	1.7	C	5	7	39.9	E	3660	45.7	D	
F113	I-880 - SB	Rt 92	Tennyson	Hay	1.01	C	5	7	33.6	E	3422	42.1	D	
F114	I-880 - SB	Tennyson	Alv-Niles	Hay, Uni Cty	2.6	C	4	7	41.9	D	3305	45.2	D	
F115	I-880 - SB	Alvarado-Niles	Alvarado	Uni Cty, Fre	1.56	S	4	7	54.0	C	3547	52.8	C	
F116	I-880 - SB	Alvarado	Decoto	Uni Cty	1.19	S	4	7	42.2	D	3309	47.8	D	
F117	I-880 - SB	Decoto	Stevenson	Fre	4.06	S	4	7	54.4	C	3426	55.9	B	
F118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	1.52	C	4	7	64.5	A	3783	65.3	A	
F119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2.83	C	4	6	62.5	A	3783	66.7	A	[1]
F120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	1.69	S	4	6	68.1	A	3783	66.2	A	
F121	I-980 - WB	SR 24 @ 580	I-880	Oak	2.49	N	4	7	65.2	A	2349	57.2	B	
F122	I-980 - EB	I-880	SR 24 @ 580	Oak	2.44	N	4	7	39.4	E	2486	38.6	E	
F123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1.27	N	2	6	83.1	A	3397	63.0	A	
F124	SR 13 - NB	Carson/Redwood (1) (off)	Joaquin Miller	Oak	1.08	N	2	6	43.3	D	3505	59.2	B	
F125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1.83	N	2	6	56.0	B	3498	31.7	E	
F126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1.63	N	2	6	18.9	(F20)	1899	17.2	(F20)	
F127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1.6	N	2	7	54.1	C	1390	52.9	C	
F128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1.85	N	2	7	69.6	A	2824	60.6	A	
F129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1.07	N	2	7	61.1	A	3334	62.9	A	
F130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1.4	N	2	7	15.6	(F20)	3148	22.1	(F30)	
F131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1.84	N	4	7	16.0	(F20)	3779	14.1	(F20)	
F132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1.65	N	4	7	14.1	(F20)	3660	12.9	(F20)	
F133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1.04	N	4	7	35.9	E	3657	30.0	(F30)	

Table B-1: 2014 LOS Monitoring Results for Freeways (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F134	SR 24 - WB	Fish Ranch Road (CC)	Caldecott (exit)	Oak	0.99	N	4	7	51	C	1397	47.1	D	
F135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1.73	N	4	7	68.8	A	3318	58.2	B	
F136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1.86	N	4	7	57.8	B	3741	61.0	A	
F137	SR 84 - EB	San M CL	Toll Plaza	Fre	3.29	S	3	6	51.9	C	3783	58.1	B	
F138	SR 84 - EB	Toll Plaza	Thornton	Fre	0.54	S	3	6	57.2	B	3664	55.5	B	
F139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	New	1.16	S	3	6	45.9	D	3544	40.7	E	
F140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	New	1.2	S	2	6	16.4	(F20)	3660	16.1	(F20)	
F141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	1.21	S	3	6	47.2	D	3364	43.6	D	
F142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	1.15	S	3	6	63.4	A	2818	62.7	A	
F143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	0.54	S	3	6	44.0	D	3696	46.6	D	
F144	SR 84 - WB	Toll Plaza	San M CL	Fre	3.29	C	3	6	64.1	A	2745	61.4	A	
F145	SR 92 - EB	San M CL	Toll Plaza	Hay	2.78	C	3	7	47.4	D	3543	41.5	D	
F146	SR 92 - EB	Toll Plaza	Clawiter	Hay	1.87	C	3	7	49.7	C	3539	39.0	E	[2]
F147	SR 92 - EB	Clawiter	I-880	Hay	2.07	C	4	7	54.4	C	3050	20.5	(F30)	
F148	SR 92 - WB	I-880	Clawiter	Hay	2.05	C	4	6	59.7	B	3512	62.0	A	
F149	SR 92 - WB	Clawiter	Toll Plaza	Hay	1.88	C	4	6	42.2	D	3753	57.6	B	
F150	SR 92 - WB	Toll Plaza	San M CL	Hay	2.79	C	3	6	61.7	A	3746	65.8	A	

Comments

[1] Data impacted by long term construction and recurrent lane closures

[2] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

Table B-2: 2014 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F1	I-80 - EB	SF County Line	Toll Plaza	Oak	2.01	N	5	7	57.2	B	3302	58.6	B	
F2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1.3	N	6	7	55.8	B	3728	60.6	A	
F3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery	0.54	N	6	7	72.9	A	3191	53.3	C	
F4	I-80 - EB	Powell	Ashby	Emery, Berk	0.72	N	6	7	51.2	C	3074	60.7	A	
F5	I-80 - EB	Ashby	University	Berk	1.3	N	5	7	64.4	A	3072	61.5	A	
F6	I-80 - EB	University	Jct I-580 (off)	Berk, Alb	1.37	N	5	7	62.4	A	3194	62.6	A	

Appendix B. 2014 Level of Service Results

Table B-2: 2014 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F7	I-80 - EB	Jct I-580 (off)	Central (County Line)	Alb	0.84	N	4	7	59.4	B	3194	64.3	A	[2]
F8	I-80 - WB	Central (County Line)	Jct I-580	Alb	0.7	N	4	7	22.7	(F30)	3075	16.3	(F20)	
F9	I-80 - WB	Jct I-580	University	Berk, Alb	1.51	N	6	7	24.9	(F30)	2841	19.5	(F20)	
F10	I-80 - WB	University	Ashby	Berk	1.31	N	5	7	47.7	D	2957	32.6	E	
F11	I-80 - WB	Ashby	Powell	Emery	0.71	N	5	7	49.3	C	2698	32.2	E	
F12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery	0.47	N	6	7	47.3	D	2688	33.1	E	
F13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1.31	N	8	7	6.0	(F10)	3279	7.7	(F10)	
F14	I-80 - WB	Toll Plaza	SF County	Oak	2.01	N	4	7	17.8	(F20)	3421	27.0	(F30)	
F15	I-238 - EB	I-880	I-580	Uninc, San L	2.59	C	3	10	60.3	A	3766	55.2	B	
F16	I-238 - WB	I-580	I-880	Uninc, San L	2.48	C	3	8	20.8	(F30)	3765	22.3	(F30)	
F17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Uninc	2.68	C	5	8	54.8	C	3538	55.5	B	
F18	I-580 EB	Grove	Eden Canyon	Uninc, Plea	2.19	E	4	8	67.3	A	3775	51.3	C	
F19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc, Plea	4.82	E	4	8	60.4	A	3428	59.4	B	
F20	I-580 EB	San Ramon/ Foothill	I-680	Plea	0.71	E	4	8	63.7	A	3662	63.6	A	
F21	I-580 EB	I-680	Hopyard	Plea	0.87	E	6	8	61.5	A	3781	65.4	A	
F22	I-580 EB	Hopyard	Santa Rita	Plea	1.9	E	6	8	66.9	A	3900	65.4	A	[1]
F23	I-580 EB	Santa Rita	El Charro	Uninc, Plea	1.25	E	6	8	67.8	A	3900	66.1	A	[1]
F24	I-580 EB	El Charro	SR 84/Airway Blvd.	Uninc	1.72	E	6	8	66.9	A	3900	65.6	A	[1] [2]
F25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	1.73	E	5	8	68.3	A	3900	65.4	A	[1]
F26	I-580 - EB	Portola	1st St	Liv	2.56	E	5	8	68.1	A	3900	66.1	A	[1] [2]
F27	I-580 - EB	1st St	Greenville	Liv	2.13	E	6	8	56.6	B	3900	61.7	A	[1] [2]
F28	I-580 - EB	Greenville	N.Flynn	Uninc	2.73	E	4	8	42.8	D	3543	63.4	A	[1] [2]
F29	I-580 - EB	N.Flynn	Grant Line	Uninc	4.32	E	4	8	50.6	C	3067	67.3	A	[2]
F30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	0.87	E	5	8	46.7	D	3737	65.9	A	[2]
F31	I-580 - WB	I-205 (SJ Co)	Grant Line	Uninc	0.72	E	5	8	36.7	E	3514	48.9	D	[2]
F32	I-580 - WB	Grant Line	N Flynn	Uninc	4.59	E	4	8	45.9	D	3424	39.7	E	
F33	I-580 - WB	N Flynn	Greenville Rd	Liv, Uninc	2.43	E	5	8	36.6	E	3666	34.6	E	
F34	I-580 - WB	Greenville Rd	1st St	Liv	2.21	E	4	8	23.8	(F30)	3547	23.5	(F30)	
F35	I-580 - WB	1st St	Portola Ave	Liv	2.56	E	4	8	22.3	(F30)	3781	26.5	(F30)	[1]
F36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	1.73	E	4	8	37.4	E	3781	27.1	(F30)	[1]

Table B-2: 2014 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv, Uninc	1.73	E	4	7	40.9	E	3664	35.0	E	[1]
F38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	1.23	E	4	7	45.1	D	3664	42.6	D	[1]
F39	I-580 - WB	Tassajara Rd	I-680	Plea	2.78	E	4	7	49.1	C	3425	44.6	D	
F40	I-580 - WB	I-680	San Ramon Rd	Plea	0.71	E	4	7	64.4	A	3425	61.3	A	
F41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea, Uninc	4.82	E	4	7	65.2	A	3308	64.3	A	
F42	I-580 - WB	Eden Canyon	Center St	Uninc	2.5	E	4	7	66.9	A	3537	61.3	A	
F43	I-580 - WB	Center	I-580/238	Uninc	2.26	C	5	7	47.5	D	3538	53.1	C	
F44	I-580 - EB	I-80	I-980	Oak	1.27	N	5	8	49.0	C	3528	56.5	B	
F45	I-580 - EB	I-980	Harrison	Oak	1.02	N	5	8	66.3	A	3759	63.8	A	
F46	I-580 - EB	Harrison	Lakeshore	Oak	0.84	N	4	8	62.3	A	3765	66.3	A	
F47	I-580 - EB	Lakeshore	Coolidge	Oak	2.21	N	5	8	67.6	A	3760	65.5	A	
F48	I-580 - EB	Coolidge	SH 13 Off	Oak	2.2	N	4	8	67.7	A	3348	66.4	A	
F49	I-580 - EB	SH 13 Off	MacArthur	Oak	4.08	N	4	8	64.4	A	3098	67.6	A	
F50	I-580 - EB	MacArthur	I-580/238	San L, Uninc	3.78	C	4	8	66.4	A	3673	67.8	A	
F51	I-580 - WB	I-238	Foothill/MacArthur	Uninc	3.86	C	4	7	74.1	A	3291	58.2	B	
F52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak	4.04	N	4	7	61.4	A	3656	36.9	E	
F53	I-580 - WB	SH 13 Off	Fruitvale	Oak	2.63	N	4	7	26.4	(F30)	3412	29.4	(F30)	
F54	I-580 - WB	Fruitvale	Harrison	Oak	2.68	N	4	7	36.6	E	3539	45.5	D	
F55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1.24	N	5	7	46.8	D	3658	41.2	D	
F56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1.17	N	5	7	16.9	(F20)	3646	24.3	(F30)	[2]
F57	I-580 - EB	Central (County Line)	I-80 Jct	Alb	0.7	N	2	8	27.3	(F30)	7	28.1	(F30)	
F58	I-580 - WB	I-80 Jct	Central (County Line)	Alb	0.86	N	3	6	69.2	A	7	59.5	B	
F59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	2.26	S	3	6	65.5	A	3772	65.0	A	
F60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	1.62	S	3	6	66.2	A	3542	66.1	A	
F61	I-680 - NB	Durham Rd	Washington Blvd	Fre	1.3	S	3	6	65.9	A	3772	65.7	A	[2]
F62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	1.14	S	3	6	69.7	A	3653	63.9	A	[2]
F63	I-680 NB	SR 238/Mission	Vargas Rd	Fre	1.1	S	4	6	62.4	A	3653	64.1	A	[2]
F64	I-680 NB	Vargas Rd	Andrade Rd	Uninc	2.21	S	4	6	65.2	A	3898	64.9	A	
F65	I-680 NB	Andrade Rd	Calaveras	Uninc	1.15	S	3	6	64.1	A	3900	66.3	A	
F66	I-680 NB	Calaveras	Rt.84/Vallecitos	Uninc	0.39	S	3	6	73.4	A	3900	65.4	A	

Appendix B. 2014 Level of Service Results

Table B-2: 2014 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F67	I-680 NB	SR 84	Sunol Blvd	Plea, Uninc	3.52	E	3	6	68.3	A	3898	67.5	A	
F68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea, Uninc	1.49	E	3	6	64.6	A	3897	67.6	A	
F69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	2.53	E	3	6	65.4	A	3897	67.2	A	
F70	I-680 NB	Stoneridge Dr	I-580	Plea	0.74	E	4	6	70.3	A	3900	61.1	A	
F71	I-680 - NB	I-580	Alcosta	Dub	1.85	E	4	6	47.9	D	3663	52.9	C	
F72	I-680 - SB	Alcosta	I-580	Dub	1.85	E	5	7	67.5	A	3900	62.4	A	
F73	I-680 SB	I-580	Stoneridge Dr	Plea	0.73	E	4	7	44.5	D	3662	40.6	E	
F74	I-680 SB	Stoneridge Dr	Bernal	Plea	2.54	E	3	7	40.5	E	3664	36.7	E	
F75	I-680 SB	Bernal Ave.	Sunol Blvd	Uninc	1.49	E	3	7	27.5 (F30)		3426	34.0	E	
F76	I-680 SB	Sunol Blvd.	SR 84	Uninc	3.71	E	3	7	44.9	D	3900	42.8	D	
F77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Uninc	1.33	S	4	7	49.0	D	3900	51.7	C	
F78	I-680 SB	Andrade Rd	Sheridon Rd	Uninc	1.4	S	5	7	56.7	B	3898	50.8	C	
F79	I-680 SB	Sheridon Rd	Vargas Rd	Uninc	0.81	S	4	7	58.7	B	3900	53.2	C	
F80	I-680 SB	Vargas Rd	SR 238/Mission	Fre	1.11	S	4	7	46.7	D	3772	57.2	B	
F81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	1.14	S	4	7	50.3	C	3534	57.5	B	
F82	I-680 - SB	Washington Blvd	Durham Rd	Fre	1.35	S	4	7	51.0	C	3305	43.9	D	
F83	I-680 - SB	Durham Rd	Rt 262/Mission	Fre	1.63	S	4	7	51.3	C	3190	43.4	D	
F84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	2.25	S	4	7	63.0	A	3772	66.3	A	
F85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	2.09	S	6	7	75.5	A	3772	66.7	A	
F86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	2.43	S	4	7	68.8	A	3419	63.4	A	[1]
F87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	1.53	S	4	7	68.2	A	3536	64.7	A	
F88	I-880 - NB	Stevenson	Decoto	Fre	4.06	S	4	8	65.9	A	3772	61.8	A	
F89	I-880 - NB	Decoto	Alvarado Blvd	Fre	1.17	S	4	8	53.1	C	3543	51.9	C	
F90	I-880 - NB	Alvarado Blvd	Alvarado-Niles Blvd	Fre, Uni Cty	1.57	S	4	8	45.8	D	3307	47.9	D	
F91	I-880 - NB	Alv-Niles	Tennyson	Uni Cty, Hay	2.6	S	4	8	38.1	E	3191	38.9	E	
F92	I-880 - NB	Tennyson	SR 92	Hay	1.02	C	5	8	64.5	A	3539	49.4	C	
F93	I-880 - NB	SR 92	A St	Hay	1.68	C	5	8	53.1	C	3184	50.8	C	
F94	I-880 - NB	A St	I-238 (Marina before 06)	Uninc	1.95	C	5	8	57.9	B	3539	48.0	D	
F95	I-880 - NB	I-880/I238 (split)	Marina Blvd	San L	2.54	C	5	8	34.3	E	2945	28.5	(F30)	
F96	I-880 - NB	Marina Blvd	SR 112/Davis	San L	0.82	C	4	8	30.0 (F30)		3299	27.9	(F30)	

Table B-2: 2014 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F97	I-880 - NB	SR 112/Davis	Hegenberger	Oak, San L	1.83	C	4	8	29.8	(F30)	3539	31.4	E	
F98	I-880 - NB	Hegenberger	High/42nd	Oak	2.34	N	4	7	30.8	E	3656	24.3	(F30)	
F99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1.25	N	4	7	33.2	E	3195	26.5	(F30)	
F100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	2.63	N	4	7	48.0	D	3305	45.0	D	
F101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	2.43	N	4	7	63.7	A	3652	63.1	A	
F102	I-880 - NB	I-880/I238 (split)	I-880/I-80 (merge)	Oak	1.44	N	4	7	65.1	A	3770	60.2	A	
F103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1.28	N	4	8	67.5	A	3773	56.9	B	[2]
F104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	2.51	N	4	8	83.0	A	3775	58.9	B	[2]
F105	I-880 - SB	I-980	23rd	Oak	2.74	N	5	8	60.7	A	3311	59.4	B	
F106	I-880 - SB	23rd St	High/42nd	Oak	1.1	N	5	8	56.7	B	3775	60.0	A	
F107	I-880 - SB	High/42nd	Hegenberger	Oak	2.36	N	4	8	61.0	A	3775	61.8	A	
F108	I-880 - SB	Hegenberger	SR 112/Davis	Oak, San L	1.82	N	4	8	60.6	A	3538	60.3	A	[1]
F109	I-880 - SB	SR 112/Davis	Marina Blvd	San L	0.82	N	4	8	72.2	A	3656	52.1	C	[1]
F110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak, San L	2.55	N	4	8	47.2	D	3537	39.8	E	[1]
F111	I-880 - SB	I-238 (Marina before 06)	A St	Uninc	1.91	C	5	8	22.4	(F30)	3182	22.4	(F30)	
F112	I-880 - SB	A St	Rt 92	Hay	1.7	C	5	8	34.1	E	3537	29.6	(F30)	
F113	I-880 - SB	Rt 92	Tennyson	Hay	1.01	C	5	8	23.0	(F30)	3421	28.0	(F30)	
F114	I-880 - SB	Tennyson	Alv-Niles	Hay, Uni Cty	2.6	C	4	8	23.5	(F30)	2954	27.2	(F30)	
F115	I-880 - SB	Alvarado-Niles	Alvarado	Uni Cty, Fre	1.56	C	4	8	24.6	(F30)	3424	24.8	(F30)	
F116	I-880 - SB	Alvarado	Decoto	Fre	1.19	C	4	8	26.8	(F30)	3424	29.1	(F30)	
F117	I-880 - SB	Decoto	Stevenson	Fre	4.06	S	4	8	20.2	(F30)	3308	29.8	(F30)	
F118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	1.52	C	4	7	35.5	E	3653	40.3	E	
F119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2.83	C	4	7	32.3	E	3536	42.5	D	[1]
F120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	1.69	S	4	7	46.1	D	3772	54.1	C	
F121	I-980 - WB	SR 24 @ 580	I-880	Oak	2.49	N	4	7	63.7	A	3775	59.5	B	
F122	I-980 - EB	I-880	SR 24 @ 580	Oak	2.44	N	4	6	60.2	A	3656	61.1	A	
F123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1.27	N	2	6	85.8	A	3259	55.3	B	
F124	SR 13 - NB	Carson/Redwood (1) (off)	Joaguin Miller	Oak	1.08	N	2	6	39.4	E	3371	47.5	D	
F125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1.83	N	2	6	35.4	E	3182	40.5	E	
F126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1.63	N	2	6	23.2	(F30)	1776	33.8	E	

Appendix B. 2014 Level of Service Results

Table B-2: 2014 LOS Monitoring Results for Freeways (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1.6	N	2	6	55.9	B	753	54.0	C	
F128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1.85	N	2	6	72.0	A	3025	62.8	A	
F129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1.07	N	2	6	62.6	A	3221	64.1	A	
F130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1.4	N	2	6	41.6	D	3130	56.5	B	
F131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1.84	N	4	6	65.2	A	3775	62.8	A	
F132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1.65	N	4	6	18.3	(F20)	3538	54.5	C	
F133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1.04	N	4	6	40.2	E	3506	46.0	D	
F134	SR 24 - WB	Fish Ranch Road (CC)	Caldecott (exit)	Oak	0.99	N	4	8	50.2	C	2603	48.7	D	
F135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1.73	N	4	8	60.3	A	3537	52.6	C	
F136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1.86	N	4	7	49.2	C	3656	43.0	D	
F137	SR 84 - EB	San M CL	Toll Plaza	Fre	3.29	S	3	6	53.9	C	3765	64.7	A	
F138	SR 84 - EB	Toll Plaza	Thornton	Fre	0.54	S	3	6	58.3	B	3762	63.5	A	
F139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	New	1.16	S	3	6	65.9	A	3696	63.1	A	
F140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	New	1.2	S	2	6	41.8	D	3703	45.6	D	
F141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	1.21	S	3	6	42.7	D	3772	39.3	E	
F142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	1.15	S	3	6	36.3	E	3757	36.7	E	
F143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	0.54	S	3	6	31.0	E	3649	29.8	(F30)	
F144	SR 84 - WB	Toll Plaza	San M CL	Fre	3.29	C	3	6	60.7	A	3653	44.1	D	
F145	SR 92 - EB	San M CL	Toll Plaza	Hay	2.78	C	3	7	65.6	A	3752	66.0	A	
F146	SR 92 - EB	Toll Plaza	Clawiter	Hay	1.87	C	3	7	62.1	A	3724	65.7	A	[2]
F147	SR 92 - EB	Clawiter	I-880	Hay	2.07	C	4	7	67.8	A	2668	58.2	B	
F148	SR 92 - WB	I-880	Clawiter	Hay	2.05	C	4	6	55.1	B	3536	30.5	E	
F149	SR 92 - WB	Clawiter	Toll Plaza	Hay	1.88	C	4	6	35.7	E	2954	25.4	(F30)	
F150	SR 92 - WB	Toll Plaza	San M CL	Hay	2.79	C	3	6	59.0	B	2954	43.5	D	

Comments

[1] Data impacted by long term construction and recurrent lane closures

[2] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

Table B-3: 2014 LOS Monitoring Results for Freeways (Tier 1) – Weekend Midday Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 LOS results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F1	I-80 - EB	SF County Line	Toll Plaza	Oak	2.01	N	5	6	56.8	B	3092	58.5	B	
F2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1.3	N	6	6	48.0	D	3092	48.2	D	
F3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery	0.54	N	6	6	23.1	(F30)	3092	21.8	(F30)	
F4	I-80 - EB	Powell	Ashby	Emery, Berk	0.72	N	6	6	16.9	(F20)	3092	21.6	(F30)	
F5	I-80 - EB	Ashby	University	Berk	1.3	N	5	6	39.8	E	3092	38.4	E	
F6	I-80 - EB	University	Jct I-580 (off)	Berk, Alb	1.37	N	5	6	59.6	B	3092	58.8	B	
F7	I-80 - EB	Jct I-580 (off)	Central (County Line)	Alb	0.84	N	4	6	61.4	A	3092	60.9	A	[2]
F8	I-80 - WB	Central (County Line)	Jct I-580	Alb	0.7	N	4	6	27.5	(F30)	3092	26.0	(F30)	
F9	I-80 - WB	Jct I-580	University	Berk, Alb	1.51	N	6	6	25.5	(F30)	3088	22.7	(F30)	
F10	I-80 - WB	University	Ashby	Berk	1.31	N	5	6	36.5	E	3092	27.3	(F30)	
F11	I-80 - WB	Ashby	Powell	Emery	0.71	N	5	6	39.1	E	2526	23.7	(F30)	
F12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery	0.47	N	6	6	35.9	E	2748	34.7	E	
F13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1.31	N	8	6	13.5	(F20)	2933	24.9	(F30)	
F14	I-80 - WB	Toll Plaza	SF County	Oak	2.01	N	4	6	18.1	(F20)	3078	31.8	E	
F15	I-238 - EB	I-880	I-580	Uninc, San L	2.59	C	3	6	64.8	A	2940	60.5	A	
F16	I-238 - WB	I-580	I-880	Uninc, San L	2.48	C	3	6	35.8	E	2496	42.6	D	
F17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Uninc	2.68	C	5	6	59.1	B	3092	61.1	A	
F18	I-580 EB	Grove	Eden Canyon	Uninc, Plea	2.19	E	4	6	80.0	A	3092	54.7	C	
F19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc, Plea	4.82	E	4	6	70.6	A	3092	52.0	C	
F20	I-580 EB	San Ramon/ Foothill	I-680	Plea	0.71	E	4	6	71.4	A	3092	66.3	A	
F21	I-580 EB	I-680	Hopyard	Plea	0.87	E	6	6	67.6	A	3092	67.6	A	
F22	I-580 EB	Hopyard	Santa Rita	Plea	1.9	E	6	6	71.9	A	3092	67.1	A	[1]
F23	I-580 EB	Santa Rita	El Charro	Uninc, Plea	1.25	E	6	6	71.0	A	3092	68.9	A	[1]
F24	I-580 EB	El Charro	SR 84/Airway Blvd.	Uninc	1.72	E	6	6	69.3	A	3092	69.3	A	[1] [2]
F25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	1.73	E	5	7	71.2	A	3092	68.8	A	[1]
F26	I-580 - EB	Portola	1st St	Liv	2.56	E	5	7	70.4	A	3092	69.6	A	[1] [2]
F27	I-580 - EB	1st St	Greenville	Liv	2.13	E	6	7	60.5	A	3092	69.2	A	[1] [2]
F28	I-580 - EB	Greenville	N.Flynn	Uninc	2.73	E	4	7	46.0	D	3076	65.1	A	[1] [2]
F29	I-580 - EB	N.Flynn	Grant Line	Uninc	4.32	E	4	7	53.3	C	3074	69.9	A	[2]
F30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	0.87	E	5	7	48.4	D	3016	68.7	A	[2]

Appendix B. 2014 Level of Service Results

Table B-3: 2014 LOS Monitoring Results for Freeways (Tier 1) – Weekend Midday Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 LOS results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F31	I-580 - WB	I-205 (SJ Co)	Grant Line	Uninc	0.72	E	5	6	40.4	E	2453	65.8	A	[2]
F32	I-580 - WB	Grant Line	N Flynn	Uninc	4.59	E	4	6	72.3	A	3045	66.5	A	
F33	I-580 - WB	N Flynn	Greenville Rd	Liv, Uninc	2.43	E	5	6	73.0	A	3092	68.8	A	
F34	I-580 - WB	Greenville Rd	1st St	Liv	2.21	E	4	6	70.5	A	3092	66.6	A	
F35	I-580 - WB	1st St	Portola Ave	Liv	2.56	E	4	6	68.3	A	3092	58.8	B	[1]
F36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	1.73	E	4	6	69.2	A	3092	48.5	D	[1]
F37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv, Uninc	1.73	E	4	6	60.9	A	3092	49.2	C	[1]
F38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	1.23	E	4	6	57.7	B	3092	50.2	C	[1]
F39	I-580 - WB	Tassajara Rd	I-680	Plea	2.78	E	4	6	54.2	C	3092	38.6	E	
F40	I-580 - WB	I-680	San Ramon Rd	Plea	0.71	E	4	6	68.4	A	3092	64.4	A	
F41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea, Uninc	4.82	E	4	6	69.8	A	3092	67.7	A	
F42	I-580 - WB	Eden Canyon	Center St	Uninc	2.5	E	4	6	74.6	A	3092	68.1	A	
F43	I-580 - WB	Center	I-580/238	Uninc	2.26	C	5	6	64.8	A	3092	65.7	A	
F44	I-580 - EB	I-80	I-980	Oak	1.27	N	5	6	49.8	C	3086	55.6	B	
F45	I-580 - EB	I-980	Harrison	Oak	1.02	N	5	6	92.9	A	3092	62.4	A	
F46	I-580 - EB	Harrison	Lakeshore	Oak	0.84	N	4	6	62.4	A	3092	64.3	A	
F47	I-580 - EB	Lakeshore	Coolidge	Oak	2.21	N	5	6	66.7	A	3092	64.2	A	
F48	I-580 - EB	Coolidge	SH 13 Off	Oak	2.2	N	4	6	67.9	A	2909	66.6	A	
F49	I-580 - EB	SH 13 Off	MacArthur	Oak	4.08	N	4	6	64.1	A	2881	67.6	A	
F50	I-580 - EB	MacArthur	I-580/238	San L, Uninc	3.78	C	4	6	68.4	A	2829	67.3	A	
F51	I-580 - WB	I-238	Foothill/MacArthur	Uninc	3.86	C	4	6	75.3	A	2789	68.1	A	
F52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak	4.04	N	4	6	67.6	A	2874	67.2	A	
F53	I-580 - WB	SH 13 Off	Fruitvale	Oak	2.63	N	4	6	61.6	A	3061	67.8	A	
F54	I-580 - WB	Fruitvale	Harrison	Oak	2.68	N	4	6	47.1	D	3092	64.4	A	
F55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1.24	N	5	6	21.1	(F30)	3092	46.8	D	
F56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1.17	N	5	6	13.2	(F20)	3083	25.0	(F30)	[2]
F57	I-580 - EB	Central (County Line)	I-80 Jct	Alb	0.7	N	2	6	23.2	(F30)	6	45.8	D	
F58	I-580 - WB	I-80 Jct	Central (County Line)	Alb	0.86	N	3	6	69.8	A	2944	31.2	E	
F59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	2.26	S	3	6	68.5	A	3092	64.8	A	
F60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	1.62	S	3	6	52.2	C	3092	61.5	A	

Table B-3: 2014 LOS Monitoring Results for Freeways (Tier 1) – Weekend Midday Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 LOS results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F61	I-680 - NB	Durham Rd	Washington Blvd	Fre	1.3	S	3	6	53.5	C	3092	56.8	B	[2]
F62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	1.14	S	3	6	58.1	B	3092	58.6	B	[2]
F63	I-680 NB	SR 238/Mission	Vargas Rd	Fre	1.1	S	4	6	61.9	A	3026	62.0	A	[2]
F64	I-680 NB	Vargas Rd	Andrade Rd	Uninc	2.21	S	4	6	65.8	A	2963	65.0	A	
F65	I-680 NB	Andrade Rd	Calaveras	Uninc	1.15	S	3	6	63.6	A	3002	64.9	A	
F66	I-680 NB	Calaveras	Rt.84/Vallecitos	Uninc	0.39	S	3	6	73.8	A	2976	65.3	A	
F67	I-680 NB	SR 84	Sunol Blvd	Plea, Uninc	3.52	E	3	6	69.2	A	2956	68.4	A	
F68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea, Uninc	1.49	E	3	6	65.0	A	2984	67.3	A	
F69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	2.53	E	3	6	64.3	A	2994	65.6	A	
F70	I-680 NB	Stoneridge Dr	I-580	Plea	0.74	E	4	6	70.1	A	3092	62.7	A	
F71	I-680 - NB	I-580	Alcosta	Dub	1.85	E	4	6	65.0	A	3092	63.4	A	
F72	I-680 - SB	Alcosta	I-580	Dub	1.85	E	5	6	69.5	A	3092	68.9	A	
F73	I-680 SB	I-580	Stoneridge Dr	Plea	0.73	E	4	6	61.3	A	3092	66.6	A	
F74	I-680 SB	Stoneridge Dr	Bernal	Plea	2.54	E	3	6	67.0	A	3070	67.8	A	
F75	I-680 SB	Bernal Ave.	Sunol Blvd	Uninc	1.49	E	3	6	59.7	B	3065	67.3	A	
F76	I-680 SB	Sunol Blvd.	SR 84	Uninc	3.71	E	3	6	68.5	A	3058	67.6	A	
F77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Uninc	1.33	S	4	6	65.4	A	3065	67.6	A	
F78	I-680 SB	Andrade Rd	Sheridon Rd	Uninc	1.4	S	5	6	63.1	A	3074	62.1	A	
F79	I-680 SB	Sheridon Rd	Vargas Rd	Uninc	0.81	S	4	6	66.8	A	3073	65.7	A	
F80	I-680 SB	Vargas Rd	SR 238/Mission	Fre	1.11	S	4	6	65.3	A	3074	68.9	A	
F81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	1.14	S	4	6	65.3	A	3092	69.1	A	
F82	I-680 - SB	Washington Blvd	Durham Rd	Fre	1.35	S	4	6	69.0	A	3092	64.6	A	
F83	I-680 - SB	Durham Rd	Rt 262/Mission	Fre	1.63	S	4	6	72.1	A	3092	58.3	B	
F84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	2.25	S	4	6	65.2	A	3092	67.6	A	
F85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	2.09	S	6	10	75.2	A	3092	67.9	A	
F86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	2.43	S	4	10	68.8	A	3092	66.1	A	[1]
F87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	1.53	S	4	10	67.8	A	3092	64.9	A	
F88	I-880 - NB	Stevenson	Decoto	Fre	4.06	S	4	8	67.6	A	3092	66.4	A	
F89	I-880 - NB	Decoto	Alvarado Blvd	Fre	1.17	S	4	8	60.7	A	3092	64.1	A	
F90	I-880 - NB	Alvarado Blvd	Alvarado-Niles Blvd	Fre, Uni Cty	1.57	S	4	8	54.9	C	3092	59.9	B	

Appendix B. 2014 Level of Service Results

Table B-3: 2014 LOS Monitoring Results for Freeways (Tier 1) – Weekend Midday Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 LOS results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F91	I-880 - NB	Alv-Niles	Tennyson	Uni Cty, Hay	2.6	S	4	8	65.0	A	3092	49.5	C	
F92	I-880 - NB	Tennyson	SR 92	Hay	1.02	C	5	6	72.2	A	3088	57.9	B	
F93	I-880 - NB	SR 92	A St	Hay	1.68	C	5	6	56.4	B	3092	56.5	B	
F94	I-880 - NB	A St	I-238 (Marina before 06)	Uninc	1.95	C	5	6	65.4	A	3092	57.8	B	
F95	I-880 - NB	I-880/I238 (split)	Marina Blvd	San L	2.54	C	5	6	68.6	A	3092	64.1	A	
F96	I-880 - NB	Marina Blvd	SR 112/Davis	San L	0.82	C	4	6	65.9	A	3092	62.5	A	
F97	I-880 - NB	SR 112/Davis	Hegenberger	Oak, San L	1.83	C	4	6	68.7	A	3092	61.4	A	
F98	I-880 - NB	Hegenberger	High/42nd	Oak	2.34	N	4	6	65.1	A	3092	57.5	B	
F99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1.25	N	4	6	61.4	A	3092	58.9	B	
F100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	2.63	N	4	6	64.8	A	3090	58.5	B	
F101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	2.43	N	4	6	62.9	A	3092	63.1	A	
F102	I-880 - NB	I-880/I238 (split)	I-880/I-80 (merge)	Oak	1.44		4				3092	45.6	D	
F103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1.28	N	4	6	61.6	A	3092	58.5	B	[2]
F104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	2.51	N	4	6	82.7	A	3092	61.9	A	[2]
F105	I-880 - SB	I-980	23rd	Oak	2.74	N	5	6	58.6	B	3092	54.0	C	
F106	I-880 - SB	23rd St	High/42nd	Oak	1.1	N	5	6	73.5	A	3092	50.8	C	
F107	I-880 - SB	High/42nd	Hegenberger	Oak	2.36	N	4	6	61.3	A	3092	49.1	C	
F108	I-880 - SB	Hegenberger	SR 112/Davis	Oak, San L	1.82	N	4	6	58.4	B	3092	51.0	C	[1]
F109	I-880 - SB	SR 112/Davis	Marina Blvd	San L	0.82	N	4	6	68.8	A	3092	60.1	A	[1]
F110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak, San L	2.55	N	4	6	66.0	A	3092	59.9	B	[1]
F111	I-880 - SB	I-238 (Marina before 06)	A St	Uninc	1.91	C	5	6	65.7	A	3092	52.7	C	
F112	I-880 - SB	A St	Rt 92	Hay	1.7	C	5	6	63.3	A	3092	55.9	B	
F113	I-880 - SB	Rt 92	Tennyson	Hay	1.01	C	5	6	61.0	A	3092	57.4	B	
F114	I-880 - SB	Tennyson	Alv-Niles	Hay, Uni Cty	2.6	C	4	8	63.1	A	3092	58.5	B	
F115	I-880 - SB	Alvarado-Niles	Alvarado	Uni Cty, Fre	1.56	C	4	8	62.3	A	3092	59.2	B	
F116	I-880 - SB	Alvarado	Decoto	Fre	1.19	C	4	8	61.8	A	3092	51.8	C	
F117	I-880 - SB	Decoto	Stevenson	Fre	4.06	S	4	8	66.4	A	3092	50.9	C	
F118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	1.52	C	4	6	62.4	A	3092	65.4	A	
F119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2.83	C	4	6	63.3	A	3092	67.1	A	[1]
F120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	1.69	S	4	6	69.8	A	3092	67.9	A	

Table B-3: 2014 LOS Monitoring Results for Freeways (Tier 1) – Weekend Midday Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 LOS results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F121	I-980 - WB	SR 24 @ 580	I-880	Oak	2.49	N	4	5	66.0	A	3092	61.3	A	
F122	I-980 - EB	I-880	SR 24 @ 580	Oak	2.44	N	4	8	62.8	A	3092	62.1	A	
F123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1.27	N	2	6	91.3	A	1781	61.5	A	
F124	SR 13 - NB	Carson/Redwood (1) (off)	Joaguin Miller	Oak	1.08	N	2	6	44.4	D	2129	61.2	A	
F125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1.83	N	2	6	56.3	B	2014	62.1	A	
F126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1.63	N	2	6	30.1	E	980	50.9	C	
F127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1.6	N	2	5	60.6	A	635	53.5	C	
F128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1.85	N	2	5	74.2	A	1895	62.1	A	
F129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1.07	N	2	5	64.0	A	2057	65.2	A	
F130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1.4	N	2	5	57.2	B	1944	62.4	A	
F131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1.84	N	4	8	42.9	D	3092	63.2	A	
F132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1.65	N	4	8	43.0	D	3092	58.4	B	
F133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1.04	N	4	8	47.6	D	2895	49.6	C	
F134	SR 24 - WB	Fish Ranch Road (CC)	Caldecott (exit)	Oak	0.99	N	4	5	43.1	D	1390	55.1	B	
F135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1.73	N	4	5	71.0	A	2982	62.5	A	
F136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1.86	N	4	5	58.7	B	3092	54.8	C	
F137	SR 84 - EB	San M CL	Toll Plaza	Fre	3.29	S	3	6	54.8	C	3092	65.3	A	
F138	SR 84 - EB	Toll Plaza	Thornton	Fre	0.54	S	3	6	60.1	A	3092	65.5	A	
F139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	New	1.16	S	3	6	69.7	A	3092	63.9	A	
F140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	New	1.2	S	2	6	44.6	D	2992	47.9	D	
F141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	New	1.21	S	3	6	44.5	D	1979	49.5	C	
F142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy	New	1.15	S	3	6	65.4	A	1933	64.0	A	
F143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate	Fre	0.54	S	3	6	46.6	D	3092	46.9	D	
F144	SR 84 - WB	Toll Plaza	San M CL	Fre	3.29	C	3	6	65.1	A	2160	61.0	A	

Appendix B. 2014 Level of Service Results

Table B-3: 2014 LOS Monitoring Results for Freeways (Tier 1) – Weekend Midday Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2012 LOS results			2014 results			Note
		From	To					# Runs	Speed	LOS	Sample	Speed	LOS	
F145	SR 92 - EB	San M CL	Toll Plaza	Hay	2.78	C	3	7	65.1	A	2989	66.9	A	
F146	SR 92 - EB	Toll Plaza	Clawiter	Hay	1.87	C	3	7	62.3	A	2933	67.2	A	[2]
F147	SR 92 - EB	Clawiter	I-880	Hay	2.07	C	4	7	67.4	A	2306	60.1	A	
F148	SR 92 - WB	I-880	Clawiter	Hay	2.05	C	4	6	58.9	B	2878	63.4	A	
F149	SR 92 - WB	Clawiter	Toll Plaza	Hay	1.88	C	4	6	49.0	C	3045	56.8	B	
F150	SR 92 - WB	Toll Plaza	San M CL	Hay	2.79	C	3	6	62.3	A	3043	66.6	A	

Comments

[1] Data impacted by long term construction and recurrent lane closures

[2] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

B.2 | Ramps and Special Segments (Tier 1)

Table B-4: 2014 LOS Monitoring Results for Ramps and Special Segments (Tier 1) - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	# Lanes	Free flow speed	2012 Results			2014 Results		
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS
R1	I-80/I-580 Interchange	I-80 SB	I-580 EB	Oak	N	0.4	2	38.0	6	33.5	B	3779	31.7	B
R2	I-80/I-580 Interchange	I-580 WB	I-80 NB	Oak	N	0.45	2	40.0	6	26.3	D	3774	23.8	E
R3	SR 24 WB/I-580 WB	SR 24 Off	I-580 On	Oak	N	0.77	2	Weaving	6	33.3	N/A	2690	36.9	N/A
R4	I-580/SR 24 Interchange	I-580 WB	SR-24 EB	Oak	N	0.53	2	45.0	6	22.8	E	3720	20.7	F
R5	I-580/SR 24 Interchange	SR-24 WB	I-580 EB	Oak	N	0.75	2	51.0	3	22.9	E	2400	30.7	D
R6	SR13/SR 24 Interchange	SR-13 NB	SR-24 EB	Oak	N	0.33	1	40.0	4	7.6	F	3558	12.0	F
R7	SR13/SR 24 Interchange	SR-24 WB	SR-13 SB	Oak	N	0.16	1	31.0	5	24.0	C	2382	42.8	A
R8	I-880/I-238 Interchange	I-880 SB	I-238 EB	San L	C	0.75	2	47.0	6	40.5	B	2480	44.4	A
R9	I-880/I-238 Interchange	I-238 WB	I-880 NB	San L	C	0.51	2	54.0	6	60.1	A	2454	55.8	A
R10	I-880/I-238 Interchange	I-880 NB	I-238 EB	San L	C	0.42	2	32.0	5	17.5	E	3750	28.4	B
R11	I-880/I-238 Interchange	I-238 WB	I-880 SB	San L	C	0.81	2	53.0	5	51.2	A	3774	51.4	A
R12	I-580 /I-238 Interchange	I-580 SB	I-238 WB	Hay	C	0.7	1	37.0	3	22.9	D	N/A - segment correction		
R13	I-580 /I-238 Interchange	I-238 EB	I-580 NB	Hay	C	0.36	1	38.0	4	42.7	A	N/A - segment correction		
R14	I-580/I-680 Interchange	I-580 EB	I-680 NB	Plea	E	0.52	1	35.0	6	23.8	D	3037	38.0	A
R15	I-580/I-680 Interchange	I-580 EB	I-680 SB	Plea	E	0.29	1	42.0	6	23.8	E	2082	44.4	A
R16	I-580/I-680 Interchange	I-680 NB	I-580 EB	Plea	E	0.92	2	63.8	6	47.5	C	3813	55.5	B
R17	I-580/I-680 Interchange	I-680 NB	I-580 WB	Plea	E	0.62	1	41.0	5	41.8	A	1453	39.9	A
R18	I-580/I-680 Interchange	I-580 WB	I-680 NB	Plea	E	0.42	2	51.5	6	42.4	B	3582	47.9	A
R19	I-580/I-680 Interchange	I-580 WB	I-680 SB	Plea	E	0.64	1	39.0	6	25.1	D	3420	34.1	B
R20	I-580/I-680 Interchange	I-680 SB	I-580 EB	Plea	E	1.22	2	68.1	6	56.5	B	3836	58.2	B
R21	I-580/I-680 Interchange	I-680 SB	I-580 WB	Plea	E	0.44	2	58.4	6	44.9	C	3633	53.7	A
R22	I-880/SR 260 Connection	I-880 SB	SR-260 WB	Oak	N	0.99	varies	32.0	1	21.0	D	6	15.4	F
R23	I-880/SR 260 Connection	SR-260 EB	I-880 NB	Oak	N	0.41	varies	35.0	6	17.5	E	6	15.8	F

Appendix B. 2014 Level of Service Results

Table B-5: 2014 LOS Monitoring Results for Ramps and Special Segments (Tier 1) - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (mi)	# Lanes	Free flow speed	2012 Results			2014 Results		
		From	To						# Runs	Speed	LOS	Sample	Speed	LOS
R1	I-80/I-580 Interchange	I-80 SB	I-580 EB	Oak	N	0.4	2	38.0	4	32.5	B	3775	45.6	A
R2	I-80/I-580 Interchange	I-580 WB	I-80 NB	Oak	N	0.45	2	40.0	4	34.1	B	3765	34.1	B
R3	SR 24 WB/I-580 WB	SR 24 off	I-580 on	Oak	N	0.77	2	Weaving	3	36.5	N/A	3632	15.6	N/A
R4	I-580/SR 24 Interchange	I-580 WB	SR-24 EB	Oak	N	0.53	2	45.0	6	34.1	C	2490	55.8	A
R5	I-580/SR 24 Interchange	SR-24 WB	I-580 EB	Oak	N	0.75	2	51.0	4	49.8	A	2303	36.9	C
R6	SR13/SR 24 Interchange	SR-13 NB	SR-24 EB	Oak	N	0.33	1	40.0	6	27.8	D	2551	36.8	A
R7	SR13/SR 24 Interchange	SR-24 WB	SR-13 SB	Oak	N	0.16	1	31.0	6	23.5	C	2914	39.9	A
R8	I-880/I-238 Interchange	I-880 SB	I-238 EB	San L	C	0.75	2	47.0	2	50.7	A	3775	51.3	A
R9	I-880/I-238 Interchange	I-238 WB	I-880 NB	San L	C	0.51	2	54.0	5	51.7	A	3765	15.3	F
R10	I-880/I-238 Interchange	I-880 NB	I-238 EB	San L	C	0.42	2	32.0	6	44.9	A	3766	48.4	A
R11	I-880/I-238 Interchange	I-238 WB	I-880 SB	San L	C	0.81	2	53.0	7	36.8	D	3775	28.1	E
R12	I-580 /I-238 Interchange	I-580 SB	I-238 WB	Hay	C	0.7	1	37.0	6	22.8	D	N/A - Segment Correction		
R13	I-580 /I-238 Interchange	I-238 EB	I-580 NB	Hay	C	0.36	1	38.0	4	41.5	A	N/A - Segment Correction		
R14	I-580/I-680 Interchange	I-580 EB	I-680 NB	Plea	E	0.52	1	35.0	6	21.5	D	2958	37.5	A
R15	I-580/I-680 Interchange	I-580 EB	I-680 SB	Plea	E	0.29	1	42.0	6	21.7	E	2191	29.2	D
R16	I-580/I-680 Interchange	I-680 NB	I-580 EB	Plea	E	0.92	2	63.8	6	55.1	B	3774	58.0	A
R17	I-580/I-680 Interchange	I-680 NB	I-580 WB	Plea	E	0.62	1	41.0	4	35.7	B	2556	38.1	A
R18	I-580/I-680 Interchange	I-580 WB	I-680 NB	Plea	E	0.42	2	51.5	5	45.6	B	3866	45.9	B
R19	I-580/I-680 Interchange	I-580 WB	I-680 SB	Plea	E	0.64	1	39.0	6	25.9	D	3898	20.0	E
R20	I-580/I-680 Interchange	I-680 SB	I-580 EB	Plea	E	1.22	2	68.1	4	55.4	B	3703	61.8	A
R21	I-580/I-680 Interchange	I-680 SB	I-580 WB	Plea	E	0.44	2	58.4	6	46.9	B	3725	57.2	A
R22	I-880/SR 260 Connection	I-880 SB	SR-260 WB	Oak	N	0.99	varies	32.0	4	21.4	D	6	22.8	C
R23	I-880/SR 260 Connection	SR-260 EB	I-880 NB	Oak	N	0.41	varies	35.0	6	15.5	F	6	14.6	F

B.3 | Arterials (Tier 1)

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A1	150th St - EB	Hesperian	I-580	San L	0.49	II	C	2	6	13.6	E	6	12.5	E	
A2	150th St - WB	I-580	Hesperian	San L	0.49	II	C	2	7	18.2	C	6	13.4	E	
A3	A Street - EB	I-880	Western	Hay	1.08	II	C	2	7	18.8	C	9	20.8	C	
A4	A Street - EB	Western	SR 185 (previously SR 238)	Hay	0.31	III	C	2	6	5.2	F	9	14.7	C	[2]
A5	A Street - WB	SR 238	Western	Hay	0.54	III	C	2	6	10.3	D	6	10.7	D	
A6	A Street - WB	Western	I-880	Hay	1.07	II	C	2	6	17.7	D	6	20.6	C	
A7	Atlantic - EB	Main	Webster	Ala	0.81	II	N	2	10	19.5	C	6	20.6	C	
A8	Atlantic - WB	Webster	Main	Ala	0.81	II	N	2	6	20.7	C	6	22.1	C	
A9	Hegenberger - EB	SR 61	Edgewater	Oak	0.77	I	N	3	6	15.9	E	6	16.5	E	
A10	Hegenberger - EB	Edgewater	Baldwin	Oak	0.73	I	N	3	6	20.0	D	6	21.6	D	
A11	Hegenberger - EB	Baldwin	E 14th	Oak	1.02	I	N	3	6	25.5	C	6	22.1	C	
A12	Hegenberger - WB	E 14th	Baldwin	Oak	1.02	I	N	3	5	30.0	B	6	17.7	D	
A13	Hegenberger - WB	Baldwin	Edgewater	Oak	0.72	I	N	3	5	18.1	D	6	18.2	D	
A14	Hegenberger - WB	Edgewater	SR 61	Oak	0.77	I	N	3	5	19.5	D	6	20.2	D	
A15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	0.49	I	C	3	6	14.9	E	7	13.8	E	
A16	Hesperian - NB	SH 92	La Playa	Hay	0.78	II	C	3	6	18.3	C	7	16.0	D	
A17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	0.43	II	C	3	6	11.6	E	7	7.0	F	
A18	Hesperian - NB	W.Winton Ave	A St	Hay	0.97	II	C	3	6	13.9	E	7	18.5	C	
A19	Hesperian - NB	A St	Hacienda	Uninc	0.67	II	C	3	6	16.8	D	7	21.9	C	
A20	Hesperian - NB	Hacienda	Grant	Uninc	0.66	II	C	3	6	16.6	D	7	20.3	C	
A21	Hesperian - NB	Grant	Llewelling	Uninc	0.27	II	C	3	6	6.9	F	7	10.2	E	
A22	Hesperian - NB	Llewelling	Springlake	Uninc	0.39	II	C	3	6	18.2	C	7	17.1	D	
A23	Hesperian - NB	Springlake	Fairmont	San L	0.66	II	C	3	6	13.5	E	7	16.3	D	
A24	Hesperian - NB	Fairmont	14th	San L	0.31	II	C	2	6	15.0	D	7	10.1	E	
A25	Hesperian - SB	14th	Fairmont	San L	0.31	II	C	2	7	17.5	D	6	10.9	E	
A26	Hesperian - SB	Fairmont	Springlake	San L	0.66	II	C	3	7	17.5	D	6	19.1	C	
A27	Hesperian - SB	Springlake	Llewelling	Uninc	0.39	II	C	3	7	7.9	F	6	12.4	E	
A28	Hesperian - SB	Llewelling	Grant	Uninc	0.27	II	C	3	7	13.5	E	6	11.3	E	

Appendix B. 2014 Level of Service Results

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A29	Hesperian - SB	Grant	Hacienda	Uninc	0.66	II	C	3	7	26.8	B	6	21.5	C	
A30	Hesperian - SB	Hacienda	A St	Uninc	0.67	II	C	3	7	19.6	C	6	19.3	C	
A31	Hesperian - SB	A St	W.Winton Ave.	Hay	0.97	II	C	3	7	22.3	C	6	19.2	C	
A32	Hesperian - SB	W.Winton Ave	La Playa	Hay	0.43	II	C	3	7	18.4	C	6	18.1	C	
A33	Hesperian - SB	La Playa	SH 92	Hay	0.78	II	C	3	7	18.6	C	6	18.9	C	
A34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	0.49	I	C	3	6	11.7	F	6	20.6	D	
A35	Mowry - EB	I-880	Farwell	Fre	0.28	II	S	3	7	17.0	D	7	26.1	B	
A36	Mowry - EB	Farwell	SH 84	Fre	2.48	II	S	3	7	25.9	B	7	23.0	C	[1]
A37	Mowry - WB	SH 84	Farwell	Fre	2.53	II	S	3	7	22.7	C	7	21.0	C	[1]
A38	Mowry - WB	Farwell	I-880	Fre	0.28	II	S	3	7	23.9	C	7	20.1	C	
A39	Park/23rd - EB	Encinal	Santa Clara	Ala	0.23	III	N	2	7	11.2	D	6	9.3	D	
A40	Park/23rd - EB	Santa Clara	Kennedy	Ala	0.68	III	N	2	7	13.1	C	6	14.0	C	
A41	Park/23rd - EB	Kennedy	E 11th	Oak	0.45	II	N	2	7	19.8	C	6	18.4	C	
A42	Park/23rd - WB	E 11th	Kennedy	Oak	0.45	II	N	2	7	29.8	B	6	15.8	D	
A43	Park/23rd - WB	Kennedy	Santa Clara	Ala	0.68	III	N	2	7	12.8	D	6	10.6	D	
A44	Park/23rd - WB	Santa Clara	Encinal	Ala	0.23	III	N	2	7	9.7	D	6	11.8	D	
A45	MLK Jr Way - NB	SH 24	Adeline	Oak	1.48	II	N	3	6	17.4	D	6	21.7	C	
A46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	0.28	II	N	3	6	15.2	D	6	12.1	E	
A47	Adeline - NB	MLK Jr - North	Shattuck/Adeline	Berk	0.61	II	N	3	6	15.3	D	6	18.9	C	
A48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	0.31	II	N	2	6	15.7	D	6	16.1	D	
A49	Shattuck NB	Dwight	University	Berk	0.57	III	N	2	6	13.8	C	6	15.0	C	
A50	Shattuck SB	University	Dwight	Berk	0.57	III	N	2	7	12.8	D	6	12.4	D	
A51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	0.30	II	N	2	7	26.3	B	6	23.4	C	
A52	Adeline - SB	Shattuck/Adeline	MLK Jr - North	Berk	0.61	II	N	3	7	13.0	E	6	12.6	E	
A53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	0.29	II	N	3	7	21.5	C	6	15.3	D	
A54	MLK Jr Way - SB	Adeline	SH 24	Oak	1.39	II	N	3	7	15.3	D	6	12.7	E	
A55	Tennyson - EB	Hesperian	I-880	Hay	0.86	I	C	2	6	20.1	D	8	14.2	E	
A56	Tennyson - EB	I-880 NB	Rt 238	Hay	1.54	II	C	2	6	19.2	C	8	10.7	E	
A57	Tennyson - WB	Rt 238	I-880	Hay	1.54	II	C	2	7	20.1	C	6	16.5	D	
A58	Tennyson - WB	I-880	Hesperian	Hay	0.86	I	C	2	6	20.5	D	6	27.3	C	

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A59	University - EB	I-80 SB	6th	Berk	0.40	II	N	2	6	16.9	D	6	19.6	C	
A60	University - EB	6th	San Pablo	Berk	0.32	II	N	2	6	15.3	D	6	11.5	E	
A61	University - EB	San Pablo	Sacramento	Berk	0.56	II	N	2	6	18.4	C	6	20.8	C	
A62	University - EB	Sacramento	ML King	Berk	0.49	II	N	2	6	16.6	D	6	17.5	D	
A63	University - EB	ML King	Shattuck Pl	Berk	0.29	III	N	2	6	11.2	D	6	21.5	B	
A64	University - WB	Shattuck Pl	ML King	Berk	0.29	III	N	2	7	11.0	D	7	8.6	E	
A65	University - WB	ML King	Sacramento	Berk	0.49	II	N	2	7	24.8	B	7	18.3	C	
A66	University - WB	Sacramento	San Pablo	Berk	0.56	II	N	2	7	9.9	F	7	10.3	E	
A67	University - WB	San Pablo	6th	Berk	0.32	II	N	2	7	10.2	E	7	7.6	F	
A68	University - WB	6th	I-80 SB	Berk	0.40	II	N	2	7	37.8	A	7	33.7	A	
A69	SR 13 Ashby - WB	Hiller	Domingo	Oak, Berk	0.81	II	N	1	6	21.3	C	6	21.8	C	
A70	SR 13 Ashby - WB	Domingo	College	Berk	0.52	III	N	2	6	16.0	C	6	20.9	B	
A71	SR 13 Ashby - WB	College	Telegraph	Berk	0.37	III	N	2	6	10.2	D	6	14.4	C	
A72	SR 13 Ashby - WB	Telegraph	Shattuck	Berk	0.38	III	N	2	6	14.8	C	6	12.3	D	
A73	SR 13 Ashby - WB	Shattuck	ML King	Berk	0.26	III	N	2	6	7.8	E	6	13.1	C	
A74	SR 13 Ashby - WB	ML King	San Pablo	Berk	0.86	III	N	2	6	11.8	D	6	12.3	D	
A75	SR 13 Ashby - WB	San Pablo	I-80 Ramps	Berk	0.64	II	N	2	6	18.2	C	6	11.8	E	
A76	SR 13 Ashby - EB	I-80	San Pablo	Berk	0.62	II	N	2	6	13.9	E	8	24.6	B	
A77	SR 13 Ashby - EB	San Pablo	ML King	Berk	0.86	III	N	2	6	19.5	B	8	17.0	C	
A78	SR 13 Ashby - EB	ML King	Shattuck	Berk	0.26	III	N	2	6	7.2	E	8	9.8	D	
A79	SR 13 Ashby - EB	Shattuck	Telegraph	Berk	0.38	III	N	2	6	15.8	C	8	13.2	C	
A80	SR 13 Ashby - EB	Telegraph	College	Berk	0.37	III	N	2	6	12.9	D	8	9.5	D	
A81	SR 13 Ashby - EB	College	Domingo	Berk	0.52	III	N	2	6	7.7	E	8	9.8	D	
A82	SR 13 Ashby - EB	Domingo	Hiller	Berk, Oak	0.81	II	N	1	6	25.4	B	8	13.3	E	
A83	SR 61 - SB	Atlantic	Cent/Webster	Ala	0.57	III	N	2	7	12.7	D	6	12.3	D	
A84	SR 61 - SB	Cent/Webster	Sher/Encino	Ala	0.74	II	N	2	7	18.9	C	6	15.3	D	
A85	SR 61 - SB	Sher/Encino	Park	Ala	1.20	II	N	2	7	18.7	C	6	17.9	D	
A86	SR 61 - SB	Park	High/Otis	Ala	1.05	II	N	2	7	21.4	C	6	16.2	D	
A87	SR 61 (Doolittle) - SB	High	Island Dr	Ala	0.44	II	N	2	7	20.7	C	6	18.9	C	
A88	SR 61 (Doolittle) - SB	Island Dr	Harbor Bay Pkwy	Ala	0.51	I	N	2	6	29.0	B	6	22.4	C	

Appendix B. 2014 Level of Service Results

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A89	SR 61 - SB	Harbor Bay	Airport Dr	Oak	2.17	I	N	2	6	31.1	B	6	32.5	B	
A90	SR 61 (Doolittle) - SB	Airport	Davis	Oak, San L	0.94	I	N	2	6	30.0	B	6	24.2	C	
A91	SR 61 (Doolittle) - NB	Davis	Airport	San L, Oak	0.94	I	C	2	8	30.0	B	6	27.2	C	
A92	SR 61 - NB	Airport Dr	Harbor Bay	Oak	2.17	I	N	2	8	36.4	A	6	31.4	B	
A93	SR 61 (Doolittle) - NB	Harbor Bay	Island Dr	Ala	0.51	I	N	2	8	32.8	A	6	29.0	B	
A94	SR 61 (Doolittle) - NB	Island Dr	High/Otis	Ala	0.44	II	N	2	8	16.6	D	6	19.6	C	
A95	SR 61 - NB	High/Otis	Park	Ala	1.05	II	N	2	8	22.8	C	6	18.4	C	
A96	SR 61 - NB	Park/Encinal	Sher/Cent	Ala	1.20	II	N	2	8	17.7	D	6	18.9	C	
A97	SR 61 - NB	Sher/Cent	Web/Cent	Ala	0.74	II	N	2	8	21.5	C	6	16.2	D	
A98	SR 61 - NB	Cent/Web	Atlantic	Ala	0.57	III	N	2	8	15.0	C	6	13.9	C	
A99	SR 77 (42nd) - EB	I-880 NB	E 14th	Oak	0.36	I	N	2	No data collected due to construction			6	29.3	B	
A100	SR 77 (42nd) - WB	E 14 th	I-880 NB	Oak	0.36	I	N	2	No data collected due to construction			6	26.8	C	
A101	Decoto - WB	SH 238/Mission	Union Square	Uni Cty	0.86	II	S	2	6	17.4	D	6	21.9	C	
A102	Decoto - WB	Union Square	Alv-Niles Rd	Uni Cty	0.24	II	S	2	6	13.7	E	6	12.6	E	
A103	Decoto - WB	Alv-Niles Rd	Fremont CL	Uni Cty	0.65	II	S	2	6	29.0	B	6	15.9	D	
A104	Decoto - WB	Fremont CL	I-880 NB (off)	Fre	1.15	II	S	2	6	23.0	C	6	26.5	B	
A105	Decoto - EB	I-880 NB (off)	Union City CL	Fre	1.15	II	S	2	6	16.4	D	6	14.9	D	
A106	Decoto - EB	Union City CL	Alv-Niles Rd	Uni Cty	0.66	II	S	2	6	17.9	D	6	20.8	C	
A107	Decoto - EB	Alv-Niles Rd	Union Square	Uni Cty	0.24	II	S	2	6	19.1	C	6	14.5	D	
A108	Decoto - EB	Union Square	SH 238/Mission	Uni Cty	0.85	II	S	2	6	21.5	C	6	15.5	D	
A109	SR 84/Mowry (Fre)-WB	SH 238	Peralta	Fre	0.81	I	S	2	6	35.3	A	6	28.5	B	
A110	SR 84/Peralta (Fre)-WB	Mowry	Fremont	Fre	1.66	I	S	1	6	27.9	C	6	32.0	B	
A111	SR 84/Fremont(Fre)-WB	Peralta	Thornton	Fre	0.33	II	S	2	6	10.5	E	6	25.8	B	
A112	SR 84/Thornton(Fre)-WB	Fremont	I-880 SB	Fre	1.26	II	S	3	6	26.5	B	6	16.3	D	
A113	SR 84/Thornton (Fre)-EB	I-880 SB	Fremont	Fre	1.26	II	S	3	6	24.9	B	6	22.6	C	
A114	SR 84/Fremont (Fre)-EB	Thornton	Peralta	Fre	0.32	II	S	2	6	10.5	E	6	18.9	C	
A115	SR 84/Peralta (Fre) - EB	Fremont	Mowry	Fre	1.64	I	S	1	6	24.6	C	6	20.9	D	
A116	SR 84/Mowry (Fre) - EB	Peralta	SH 238	Fre	0.86	I	S	2	6	17.4	D	6	23.4	C	
A117	1st Street - SB	I-580 Off	N Mines	Liv	0.60	I	E	3	8	21.0	D	7	25.8	C	
A118	1st Street - SB	N Mines	Inman	Liv	1.06	I	E	2	8	31.8	B	7	26.4	C	

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A119	1st Street - NB	Inman	N Mines	Liv	1.06	I	E	2	7	30.8	B	7	34.9	B	
A120	1st Street - NB	N Mines	I-580 Off	Liv	0.60	I	E	3	7	27.4	C	7	24.9	C	
A121	SR 84 - EB	SR 238/Mission	Union City Limit	Fre	1.35	42	S	1	6	35.8	B	8	43.7	A	[3]
A122	SR 84 - EB	Union City Limit	Palomares	Fre	0.86	45	S	1	6	41.9	A	8	37.6	B	
A123	SR 84 - EB	Palomares	Niles Cnyn Quarry	Fre	2.16	44	S	1	6	43.8	A	8	46.8	A	
A124	SR 84 - EB	Niles Cnyn Quarry	Sunol Rd	Fre	1.74	47	S	1	6	47.7	A	8	44.4	A	
A125	SR 84 - EB	Sunol Rd	Plea-Sunol Rd	Fre	0.55	28	S	1	6	4.8	F	8	4.5	F	
A126	SR 84 - EB	Ple-Sunol Rd	SR 84 (Off)/I-680	Uninc	0.80	43	E	1	6	41.0	A	8	37.1	B	
A127	SR 84 - EB	SR 84 (Off)/I-680	Vallecitos Ln	Uninc	1.05	51	E	1	6	13.6	F	8	12.1	F	
A128	SR 84 - EB	Vallecitos Ln	Vallecitos Nuc.Cntr	Uninc	1.13	58	E	1	6	29.1	E	8	34.0	E	
A129	SR 84 - EB	Vallecitos Nuc Center Ent.	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.66	58	E	1	6	43.4	C	8	37.3	D	
A130	SR 84 - EB	Culvert (Lat/Long: 37.613854,-121.817224)	Ruby Hill /Kaithoff	Uninc	1.63	59	E	2	6	56.4	A	8	61.7	A	
A131	SR 84 - EB	Ruby Hill./Kaithoff	Isabel/Vallecitos	Liv	0.38	I	E	1	6	29.8	A	8	46.0	A	
A132	SR 84 (Liv) - NB	Isabel/Vallecitos	Vineyard	Liv	1.12	I	E	1	6	35.2	A	6	43.9	A	
A133	SR 84 (Liv) - NB	Vineyard	Concannon	Liv	0.60	I	E	1	6	40.0	A	6	31.4	B	
A134	SR 84 (Liv) - NB	Concannon	Stanley	Liv	1.05	I	E	1	6	37.2	A	6	29.9	B	
A135	SR 84 (Liv) - NB	Stanley	W. Jack London Blvd.	Liv	0.90	I	E	1	6	31.5	B	6	46.1	A	
A136	SR 84 (Liv) - NB	W. Jack London Blvd.	Airway/Kitty Hawk	Liv	0.49	I	E	3	6	22.0	D	6	19.6	D	
A137	Airway Blvd (old SR 84) - NB	SR 84	I-580 EB off ramp	Liv	1.06	I	E	1	6	28.6	B	6	33.0	A	
A138	Airway Blvd (old SR 84) - SB	I-580 EB off ramp	SR 84	Liv	1.06	I	E	1	6	33.5	B	6	26.7	C	
A139	SR 84 (Liv) - SB	Airway/Kitty	W. Jack London Blvd.	Liv	0.49	I	E	3	6	39.6	A	6	19.1	D	
A140	SR 84 (Liv) - SB	W. Jack London Blvd.	Stanley	Liv	0.90	I	E	1	6	44.9	A	6	27.9	C	
A141	SR 84 (Liv) - SB	Stanley	Concannon	Liv	1.05	I	E	1	6	41.3	A	6	39.5	A	
A142	SR 84 (Liv) - SB	Concannon	Vineyard	Liv	0.60	I	E	1	6	33.4	B	6	33.3	B	
A143	SR 84 (Liv) - SB	Vineyard	Isabel/Vallecitos	Liv	1.12	I	E	1	6	46.4	A	6	34.6	B	
A144	SR 84 - WB	Isabel/Vallecitos	Ruby Hill /Kaithoff	Liv	0.38	I	E	1	6	45.1	A	6	44.6	A	
A145	SR 84 - WB	Ruby Hill /Kaithoff	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.63	56	E	2	6	55.7	A	6	54.2	A	

Appendix B. 2014 Level of Service Results

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A146	SR 84 - WB	Culvert (Lat/Long: 37.613854,-121.817224)	Vallecitos Nuc.Cntr	Uninc	1.65	57	E	1	6	54.7	A	6	55.4	A	
A147	SR 84 - WB	Vallecitos Nuc.Cntr	Vallecitos Ln	Uninc	1.14	53	S	1	6	53.4	A	6	48.6	A	
A148	SR 84 - WB	Vallecitos Ln	SR 84/I-680 On	Uninc	0.86	55	S	1	6	60.5	A	6	47.4	A	[3]
A149	SR 84 - WB	SR 84/I-680 On	Ple-Sunol Rd	Uninc	0.62	41	S	1	7	43.3	A	6	32.5	C	[3]
A150	SR 84 - WB	Ple-Sunol Rd	Sunol Rd	Fre	0.55	42	S	1	7	41.5	A	6	39.1	A	
A151	SR 84 - WB	Sunol Rd	Niles Canyon Quarry	Fre	1.74	49	S	1	7	46.6	A	6	48.1	A	
A152	SR 84 - WB	Niles Canyon Quarry	Eastern Fremont City Limit	Fre	1.00	48	S	1	7	44.6	A	6	42.0	B	
A153	SR 84 - WB	Eastern Fremont City Limit	Union City Limit	Fre	2.03	42	S	1	7	43.1	A	6	40.6	A	
A154	SR 84 - WB	Union City Limit	SR 238	Fre	1.35	32	S	1	7	33.9	A	6	32.3	A	
A155	SR 92 - EB	I-880	Mission	Hay	1.71	II	C	3	7	6.9	F	6	14.5	D	
A156	SR 92 - WB	Mission	I-880	Hay	1.71	II	C	3	6	23.7	C	6	18.4	C	
A157	SR 112 (Davis) - EB	Doolittle	I-880	San L	0.52	II	C	2	7	14.1	D	9	6.5	F	[1]
A158	SR 112 (Davis) - EB	I-880	San Leandro	San L	0.99	II	C	2	7	26.2	B	9	14.8	D	[1]
A159	SR 112 (Davis) - EB	San Leandro	14th	San L	0.28	III	C	2	7	12.1	D	9	15.5	C	[1]
A160	SR 112 (Davis) - WB	E 14th	San Leandro	San L	0.28	III	C	2	6	10.8	D	6	7.2	E	[1]
A161	SR 112 (Davis) - WB	San Leandro	I-880	San L	0.99	II	C	2	6	25.6	B	6	24.4	B	[1]
A162	SR 112 (Davis) - WB	I-880	Doolittle	San L	0.52	II	C	2	8	19.5	C	6	15.0	D	[1]
A163	SR 123 San Pablo - SB	Carlson	Washington	Alb	0.51	II	N	2	6	23.8	C	8	17.5	D	
A164	SR 123 San Pablo - SB	Washington	Marin	Alb	0.36	III	N	2	6	14.7	C	8	13.6	C	
A165	SR 123 San Pablo - SB	Marin	Gilman	Alb, Berk	0.45	II	N	2	6	16.4	D	8	14.7	D	
A166	SR 123 San Pablo - SB	Gilman	University	Berk	0.81	II	N	2	6	16.4	D	8	17.6	D	
A167	SR 123 San Pablo - SB	University	Allston	Berk	0.19	III	N	2	6	13.6	C	8	13.7	C	
A168	SR 123 San Pablo - SB	Allston	Dwight	Berk	0.38	II	N	2	6	20.2	C	8	18.3	C	
A169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	0.64	II	N	2	6	13.6	E	8	13.3	E	
A170	SR 123 San Pablo - SB	Ashby	Stanford	Oak	0.80	II	N	2	6	17.2	D	8	17.4	D	
A171	SR 123 San Pablo - SB	Stanford	53rd	Oak	0.27	II	N	2	6	17.1	D	8	18.4	C	
A172	SR 123 San Pablo - SB	53rd	Park	Emery	0.34	II	N	2	6	17.6	D	8	14.5	D	
A173	SR 123 San Pablo - SB	Park	35th	Emery, Oak	0.44	II	N	2	6	12.7	E	8	9.7	F	
A174	SR 123 San Pablo - NB	35th	Park	Oak, Emery	0.42	II	N	2	6	12.3	E	6	10.4	E	

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A175	SR 123 San Pablo - NB	Park	53rd	Emery	0.34	II	N	2	6	22.9	C	6	28.2	B	
A176	SR 123 San Pablo - NB	53rd	Stanford	Oak	0.27	II	N	2	6	14.6	D	6	23.0	C	
A177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	0.80	II	N	2	6	15.0	D	6	12.8	E	
A178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	0.64	II	N	2	6	14.5	D	6	14.5	D	
A179	SR 123 San Pablo - NB	Dwight	Allston	Berk	0.38	II	N	2	6	23.9	C	6	15.7	D	
A180	SR 123 San Pablo - NB	Allston	University	Berk	0.19	III	N	2	6	5.4	F	6	11.5	D	
A181	SR 123 San Pablo - NB	University	Gilman	Berk	0.81	II	N	2	6	20.3	C	6	11.9	E	
A182	SR 123 San Pablo - NB	Gilman	Marin	Alb, Berk	0.45	II	N	2	6	13.4	E	6	15.0	D	
A183	SR 123 San Pablo - NB	Marin	Washington	Alb	0.36	III	N	2	6	23.6	B	6	12.3	D	[3]
A184	SR 123 San Pablo - NB	Washington	Carlson	Alb	0.51	II	N	2	6	19.8	C	6	16.7	D	
A185	SR 185 (International Blvd) - SB	42nd	46th St	Oak	0.29	II	N	2	7	15.1	D	8	9.2	F	
A186	SR 185 (International Blvd) - SB	46th St	Seminary	Oak	0.78	II	N	2	7	21.6	C	8	22.3	C	
A187	SR 185 (International Blvd) - SB	Seminary	73rd	Oak	0.80	II	N	2	7	10.2	E	8	14.4	D	
A188	SR 185 (International Blvd) - SB	73rd Ave	98th Ave	Oak	1.41	II	N	2	7	18.1	C	8	19.1	C	
A189	SR 185 (International Blvd) - SB	98th	Broadmoor	Oak	0.75	II	N	2	7	19.5	C	8	14.1	D	
A190	SR 185 (14th) - SB	Broadmoor	Davis	San L	0.73	II	C	2	7	19.2	C	8	19.3	C	
A191	SR 185 (14th) - SB	Davis	San Leandro	San L	1.06	III	C	2	7	19.3	B	6	18.8	C	
A192	SR 185 (14th) - SB	San L Blvd	Hesperian	San L	0.94	II	C	2	7	22.4	C	6	20.9	C	
A193	SR 185 (14th) - SB	Hesperian	Bayfair	San L	0.47	II	C	2	7	16.7	D	6	12.4	E	
A194	SR 185 (14th) - SB	Bayfair	170th	Uninc	1.19	II	S	2	7	24.1	B	6	12.1	E	
A195	SR 185 (14th) - SB	170th	Llewelling	Uninc	0.20	II	S	2	7	23.4	C	6	23.8	C	
A196	SR 185 (14th) - SB	Llewelling	Sunset	Uninc	1.05	II	S	2	7	27.0	B	6	16.4	D	
A197	SR 185 Hayward - SB	Sunset	SR 92/238	Hay	0.84	III	C	2	7	9.0	E	6	11.7	D	
A198	SR 185 Hayward - NB	A Street (SR 92/238 until 2012)	Sunset	Hay	0.43	III	C	2	10	10.6	D	6	9.7	D	[2]
A199	SR 185 (14th) - NB	Sunset	Llewelling	Uninc	1.05	II	S	2	10	24.9	B	6	20.7	C	

Appendix B. 2014 Level of Service Results

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A200	SR 185 (14th) - NB	Llewelling	170th	Uninc	0.20	II	S	2	10	30.4	A	6	20.4	C	
A201	SR 185 (14th) - NB	170th	Bayfair	Uninc	1.19	II	S	2	10	22.8	C	6	18.4	C	
A202	SR 185 (14th) - NB	Bayfair	Hesperian	San L	0.47	II	C	2	10	18.3	C	6	18.2	C	
A203	SR 185 (14th) - NB	Hesperian	San L Blvd	San L	0.94	II	C	2	10	28.1	B	6	20.7	C	
A204	SR 185 (14th) - NB	San Leandro	Davis	San L	1.06	III	C	1	10	15.7	C	6	14.2	C	
A205	SR 185 (14th) - NB	Davis	Broadmoor	San L	0.73	II	C	2	12	21.3	C	6	15.8	D	
A206	SR 185 (International Blvd) - NB	Broadmoor	98th	Oak	0.75	II	N	2	8	15.0	D	6	16.9	D	
A207	SR 185 (International Blvd) - NB	98th Ave	73rd Ave	Oak	1.41	II	N	2	8	13.9	E	6	15.1	D	
A208	SR 185 (International Blvd) - NB	73rd Ave	Seminary	Oak	0.80	II	N	2	8	14.5	D	6	14.1	D	
A209	SR 185 (International Blvd) - NB	Seminary	46th St	Oak	0.78	II		2	8	28.9	B	6	22.2	C	
A210	SR 185 (International Blvd) - NB	46th St	42nd	Oak	0.29	II		2	8	8.7	F	6	15.6	D	
A211	SR 238 (Foothill) - NB	Jackson	City Center	Hay	0.63	III	C	4	7	6.4	F	6	12.3	D	
A212	SR 238 (Foothill) - NB	City Center	I-580	Hay	0.73	II	S	3	7	21.5	C	6	13.5	E	
A213	SR 238 (Foothill) - NB	I-580 Ramp	I-580 Merge	Uninc	0.68	I	S	1	7	48.0	A	6	36.2	A	
A214	SR 238 (Foothill) - SB	I-580	Cstro V Blvd	Uninc	0.73	I	S	3	7	43.7	A	6	52.9	A	[3]
A215	SR 238 (Foothill) - SB	Cstro V Blvd	City Center	Hay, Uninc	1.04	II	C	3	7	23.1	C	6	24.5	B	
A216	SR 238 (Foothill) - SB	City Center	A Street	Hay	0.16	III	C	3	7	8.9	E	6	24.0	B	[2]
A217	SR 238 (Mission) - NB	680 NB Rmp	Stevenson	Fre	2.35	I	S	2	10	29.1	B	6	32.5	B	
A218	SR 238 (Mission) - NB	Stevenson	Nursery	Fre	2.43	I	S	2	10	33.4	B	6	28.2	B	
A219	SR 238 (Mission) - NB	Nursery	Tamarack	Uni Cty	2.63	I	S	3	9	27.3	C	6	35.9	A	[3]
A220	SR 238 (Mission) - NB	Tamarack	Industrial	Uni Cty, Hay	1.96	I	S	3	9	30.6	B	6	24.0	C	
A221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	1.46	II	C	2	9	21.5	C	6	21.4	C	
A222	SR 238 (Mission) - NB	Sorenson	Jackson	Hay	1.83	II	C	2	9	11.8	E	6	23.5	C	
A223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	1.83	II	C	2	5	18.7	C	6	16.9	D	
A224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	1.46	II	C	2	5	22.5	C	6	21.3	C	
A225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay, Uni Cty	1.96	I	C	3	5	30.2	B	6	18.2	D	

Table B-6: 2014 LOS Monitoring Results for Arterials (Tier 1) - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A226	SR 238 (Mission) - SB	Tamarack	Nursery	Uni Cty	2.63	I	S	3	5	23.6	C	6	18.8	D	[3]
A227	SR 238 (Mission) - SB	Nursery	Stevenson	Fre	2.43	I	S	2	6	33.6	B	6	16.8	E	
A228	SR 238 (Mission) - SB	Stevenson	680 NB Rmp	Fre	2.35	I	S	2	6	23.4	C	6	15.4	E	
A229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	1.35	I	N	2	8	36.5	A	6	29.1	A	
A230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	1.43	I	N	2	7	33.5	A	7	23.8	B	[3]
A231	SR 262 (Mission) - EB	I-880 NB	I-680 NB	Fre	1.48	I	S	2	7	17.8	D	8	13.4	E	
A232	SR 262 (Mission) - WB	I-680 NB	I-880 SB	Fre	1.67	I	S	2	8	30.6	B	6	20.5	D	[3]
A233	SR 84 (Liv) - NB realign	Airway	I-580 WB (off)	Liv	0.52	I	E	3	New Segment			6	37.5	A	
A234	SR 84 (Liv) - NB realign	I-580 WB (off)	Airway)	Liv	0.53	I	E	3	New Segment			6	32.6	B	

Comments

[1] Data impacted by long term construction and recurrent lane closures

[2] Part of this CMP segment is converted to a one way street in the other direction. CMP segment is now shortened

[3] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A1	150th St - EB	Hesperian	I-580	San L	0.49	II	C	2	7	15.5	D	6	15.3	D	
A2	150th St - WB	I-580	Hesperian	San L	0.49	II	C	2	7	14.9	D	6	13.6	E	
A3	A Street - EB	I-880	Western	Hay	1.08	II	C	2	6	24.0	C	6	20.2	C	
A4	A Street - EB	Western	SR 185 (SR 238 until 2012)	Hay	0.31	III	C	2	6	7.5	E	6	13.0	D	[2]
A5	A Street - WB	SR 238	Western	Hay	0.54	III	C	2	6	11.4	D	7	11.3	D	
A6	A Street - WB	Western	I-880	Hay	1.07	II	C	2	6	18.2	C	7	16.8	D	
A7	Atlantic - EB	Main	Webster	Ala	0.81	II	N	2	8	24	C	6	23.0	C	
A8	Atlantic - WB	Webster	Main	Ala	0.81	II	N	2	8	28	B	6	25.0	B	
A9	Hegenberger - EB	SR 61	Edgewater	Oak	0.77	I		3	6	18.5	D	6	16.0	E	
A10	Hegenberger - EB	Edgewater	Baldwin	Oak	0.73	I	N	3	6	24.9	C	6	22.2	C	
A11	Hegenberger - EB	Baldwin	E 14th	Oak	1.02	I	N	3	6	28.5	B	6	32.9	B	
A12	Hegenberger - WB	E 14th	Baldwin	Oak	1.02	I	N	3	6	35.1	A	7	25.7	C	
A13	Hegenberger - WB	Baldwin	Edgewater	Oak	0.72	I	N	3	6	22.0	C	7	20.4	D	

Appendix B. 2014 Level of Service Results

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A14	Hegenberger - WB	Edgewater	SR 61	Oak	0.77	I	N	3	6	20.9	D	7	23.2	C	
A15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	0.49	I	C	3	6	17.8	D	6	14.8	E	
A16	Hesperian - NB	SH 92	La Playa	Hay	0.78	II	C	3	6	23.4	C	6	27.8	B	
A17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	0.43	II	C	3	6	15.7	D	6	29.5	B	
A18	Hesperian - NB	W.Winton Ave	A St	Hay	0.97	II	C	3	6	25.2	B	6	18.6	C	
A19	Hesperian - NB	A St	Hacienda	Uninc	0.67	II	C	3	6	25.4	B	6	20.9	C	
A20	Hesperian - NB	Hacienda	Grant	Uninc	0.66	II	C	3	6	30.8	A	6	22.3	C	
A21	Hesperian - NB	Grant	Llewelling	Uninc	0.27	II	C	3	6	9.9	F	6	26.4	B	
A22	Hesperian - NB	Llewelling	Springlake	Uninc	0.39	II	C	3	6	24.2	B	6	20.6	C	
A23	Hesperian - NB	Springlake	Fairmont	San L	0.66	II	C	3	6	20.1	C	6	18.9	C	
A24	Hesperian - NB	Fairmont	14th	San L	0.31	II	C	2	6	18.0	D	6	18.2	C	
A25	Hesperian - SB	14th	Fairmont	San L	0.31	II	C	2	7	17.8	D	6	13.4	E	
A26	Hesperian - SB	Fairmont	Springlake	San L	0.66	II	C	3	7	22.2	C	6	18.2	C	
A27	Hesperian - SB	Springlake	Llewelling	Uninc	0.39	II	C	3	7	10.6	E	6	21.8	C	
A28	Hesperian - SB	Llewelling	Grant	Uninc	0.27	II	C	3	7	15.2	D	6	12.9	E	
A29	Hesperian - SB	Grant	Hacienda	Uninc	0.66	II	C	3	7	26.9	B	6	20.5	C	
A30	Hesperian - SB	Hacienda	A St	Uninc	0.67	II	C	3	7	17.0	D	6	17.7	D	
A31	Hesperian - SB	A St	W.Winton Ave.	Hay	0.97	II	C	3	7	22.1	C	6	9.3	F	
A32	Hesperian - SB	W.Winton Ave	La Playa	Hay	0.43	II	C	3	7	18.7	C	6	12.8	E	
A33	Hesperian - SB	La Playa	SH 92	Hay	0.78	II	C	3	7	18.2	C	6	18.9	C	
A34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	0.49	I	C	3	6	13.6	E	6	24.0	C	
A35	Mowry - EB	I-880	Farwell	Fre	0.28	II	S	3	6	19.9	C	7	26.6	B	
A36	Mowry - EB	Farwell	SH 84	Fre	2.48	II	S	3	6	26.8	B	7	23.4	C	[1]
A37	Mowry - WB	SH 84	Farwell	Fre	2.53	II	S	3	6	27.1	B	7	20.8	C	[1]
A38	Mowry - WB	Farwell	I-880	Fre	0.28	II	S	3	6	22.7	C	7	18.1	C	
A39	Park/23rd - EB	Encinal	Santa Clara	Ala	0.23	III	N	2	7	22.1	B	6	20.3	B	
A40	Park/23rd - EB	Santa Clara	Kennedy	Ala	0.68	III	N	2	7	12.3	D	6	9.5	D	
A41	Park/23rd - EB	Kennedy	E 11th	Oak	0.45	II	N	2	7	16.5	D	6	17.3	D	
A42	Park/23rd - WB	E 11th	Kennedy	Oak	0.45	II	N	2	8	24.8	B	6	20.2	C	
A43	Park/23rd - WB	Kennedy	Santa Clara	Ala	0.68	III	N	2	8	15.4	C	6	19.0	B	

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A44	Park/23rd - WB	Santa Clara	Encinal	Ala	0.23	III	N	2	8	12.4	D	6	14.3	C	
A45	MLK Jr Way - NB	SH 24	Adeline	Oak	1.48	II	N	3	4	22.9	C	6	32.3	A	
A46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	0.28	II	N	3	4	12.9	E	6	12.9	E	
A47	Adeline - NB	MLK Jr - North	Shattuck/Adeline	Berk	0.61	II	N	3	4	20.5	C	6	17.3	D	
A48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	0.31	II	N	2	4	23.5	C	6	16.1	D	
A49	Shattuck NB	Dwight	University	Berk	0.57	III	N	2	4	18.9	C	6	20.3	B	
A50	Shattuck SB	University	Dwight	Berk	0.57	III	N	2	4	15.4	C	6	13.0	C	
A51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	0.30	II	N	2	4	29.4	B	6	15.6	D	
A52	Adeline - SB	Shattuck/Adeline	MLK Jr - North	Berk	0.61	II	N	3	4	17.0	D	6	19.6	C	
A53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	0.29	II	N	3	4	19.0	C	6	11.7	E	
A54	MLK Jr Way - SB	Adeline	SH 24	Oak	1.39	II	N	3	4	19.1	C	6	14.4	D	
A55	Tennyson - EB	Hesperian	I-880	Hay	0.86	I	C	2	6	21.8	D	7	24.7	C	
A56	Tennyson - EB	I-880 NB	Rt 238	Hay	1.54	II	C	2	6	20.9	C	7	17.6	D	
A57	Tennyson - WB	Rt 238	I-880	Hay	1.54	II	C	2	6	18.1	C	7	15.2	D	
A58	Tennyson - WB	I-880	Hesperian	Hay	0.86	I	C	2	6	22.3	C	7	24.9	C	
A59	University - EB	I-80 SB	6th	Berk	0.40	II	N	2	8	20.8	C	7	18.6	C	
A60	University - EB	6th	San Pablo	Berk	0.32	II	N	2	8	17.5	D	7	16.7	D	
A61	University - EB	San Pablo	Sacramento	Berk	0.56	II	N	2	8	19.6	C	7	18.6	C	
A62	University - EB	Sacramento	ML King	Berk	0.49	II	N	2	8	18.8	C	7	21.8	C	
A63	University - EB	ML King	Shattuck PI	Berk	0.29	III	N	2	8	18.0	C	7	19.5	B	
A64	University - WB	Shattuck PI	ML King	Berk	0.29	III	N	2	7	17.3	C	7	14.7	C	
A65	University - WB	ML King	Sacramento	Berk	0.49	II	N	2	7	19.9	C	7	21.3	C	
A66	University - WB	Sacramento	San Pablo	Berk	0.56	II	N	2	7	20.0	C	7	18.6	C	
A67	University - WB	San Pablo	6th	Berk	0.32	II	N	2	7	20.3	C	7	17.0	D	
A68	University - WB	6th	I-80 SB	Berk	0.40	II	N	2	6	38.6	A	7	25.6	B	
A69	SR 13 Ashby - WB	Hiller	Domingo	Oak, Berk	0.81	II	N	1	6	19.3	C	7	23.4	C	
A70	SR 13 Ashby - WB	Domingo	College	Berk	0.52	III	N	2	6	14.4	C	7	17.3	C	
A71	SR 13 Ashby - WB	College	Telegraph	Berk	0.37	III	N	2	6	18.0	C	7	16.3	C	
A72	SR 13 Ashby - WB	Telegraph	Shattuck	Berk	0.38	III	N	2	6	13.1	C	7	18.4	C	
A73	SR 13 Ashby - WB	Shattuck	ML King	Berk	0.26	III	N	2	6	9.3	D	7	10.8	D	

Appendix B. 2014 Level of Service Results

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A74	SR 13 Ashby - WB	ML King	San Pablo	Berk	0.86	III	N	2	6	18.3	C	7	26.1	A	
A75	SR 13 Ashby - WB	San Pablo	I-80 Ramps	Berk	0.64	II	N	2	6	16.8	D	7	13.8	E	
A76	SR 13 Ashby - EB	I-80	San Pablo	Berk	0.62	II	N	2	6	19.5	C	6	24.2	B	
A77	SR 13 Ashby - EB	San Pablo	ML King	Berk	0.86	III	N	2	6	19.0	C	6	16.8	C	
A78	SR 13 Ashby - EB	ML King	Shattuck	Berk	0.26	III	N	2	6	10.6	D	6	15.1	C	
A79	SR 13 Ashby - EB	Shattuck	Telegraph	Berk	0.38	III	N	2	6	18.5	C	6	18.6	C	
A80	SR 13 Ashby - EB	Telegraph	College	Berk	0.37	III	N	2	6	21.3	B	6	18.9	C	
A81	SR 13 Ashby - EB	College	Domingo	Berk	0.52	III	N	2	6	20.7	B	6	21.6	B	
A82	SR 13 Ashby - EB	Domingo	Hillier	Berk, Oak	0.81	II	N	1	6	30.2	A	6	22.0	C	
A83	SR 61 - SB	Atlantic	Cent/Webster	Ala	0.57	III	N	2	7	17.3	C	7	14.4	C	
A84	SR 61 - SB	Cent/Webster	Sher/Encino	Ala	0.74	II	N	2	8	19.4	C	7	18.5	C	
A85	SR 61 - SB	Sher/Encino	Park	Ala	1.20	II	N	2	8	21.4	C	7	18.6	C	
A86	SR 61 - SB	Park	High/Otis	Ala	1.05	II	N	2	8	24.7	B	7	19.6	C	
A87	SR 61 (Doolittle) - SB	High	Island Dr	Ala	0.44	II	N	2	8	21.9	C	7	21.4	C	
A88	SR 61 (Doolittle) - SB	Island Dr	Harbor Bay Pkwy	Ala	0.51	I	N	2	7	36.6	A	7	28.0	B	
A89	SR 61 - SB	Harbor Bay	Airport Dr	Oak	2.17	I	N	2	7	32.6	B	7	29.7	B	
A90	SR 61 (Doolittle) - SB	Airport	Davis	Oak, San L	0.94	I	N	2	7	27.6	C	7	25.2	C	
A91	SR 61 (Doolittle) - NB	Davis	Airport	San L, Oak	0.94	I	C	2	7	36.1	A	6	25.3	C	
A92	SR 61 - NB	Airport Dr	Harbor Bay	Oak	2.17	I	N	2	7	36.6	A	6	34.1	B	
A93	SR 61 (Doolittle) - NB	Harbor Bay	Island Dr	Ala	0.51	I	N	2	7	25.9	B	6	24.8	B	
A94	SR 61 (Doolittle) - NB	Island Dr	High/Otis	Ala	0.44	II	N	2	7	12.3	E	6	15.9	D	
A95	SR 61 - NB	High/Otis	Park	Ala	1.05	II	N	2	7	25.0	B	6	17.7	D	
A96	SR 61 - NB	Park/Encinal	Sher/Cent	Ala	1.20	II	N	2	7	15.5	D	6	16.5	D	
A97	SR 61 - NB	Sher/Cent	Web/Cent	Ala	0.74	II	N	2	7	23.1	C	6	16.7	D	
A98	SR 61 - NB	Cent/Web	Atlantic	Ala	0.57	III	N	2	7	15.6	C	6	13.1	C	
A99	SR 77 (42nd) - EB	I-880 NB	E 14th	Oak	0.36	I	N	2	Data not collected due to construction			6	28.3	B	
A100	SR 77 (42nd) - WB	E 14 th	I-880 NB	Oak	0.36	I	N	2				6	25.8	C	
A101	Decoto - WB	SH 238/Mission	Union Square	Uni Cty	0.86	II	S	2	6	20.2	C	6	17.4	D	
A102	Decoto - WB	Union Square	Alv-Niles Rd	Uni Cty	0.24	II	S	2	6	23.5	C	6	17.1	D	
A103	Decoto - WB	Alv-Niles Rd	Fremont CL	Uni Cty	0.65	II	S	2	6	22.7	C	6	13.9	E	

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A104	Decoto - WB	Fremont CL	I-880 NB (off)	Fre	1.15	II	S	2	6	11.1	E	6	18.2	C	
A105	Decoto - EB	I-880 NB (off)	Union City CL	Fre	1.15	II	S	2	6	26.9	B	6	26.3	B	
A106	Decoto - EB	Union City CL	Alv-Niles Rd	Uni Cty	0.66	II	S	2	6	21.9	C	6	31.5	A	
A107	Decoto - EB	Alv-Niles Rd	Union Square	Uni Cty	0.24	II	S	2	6	11.8	E	6	23.1	C	
A108	Decoto - EB	Union Square	SH 238/Mission	Uni Cty	0.85	II	S	2	6	17.6	D	6	14.8	D	
A109	SR 84/Mowry (Fre)-WB	SH 238	Peralta	Fre	0.81	I	S	2	10	32.0	C	6	22.5	C	
A110	SR 84/Peralta (Fre)-WB	Mowry	Fremont	Fre	1.66	I	S	1	10	29.2	B	6	33.0	B	
A111	SR 84/Fremont(Fre)-WB	Peralta	Thornton	Fre	0.33	II	S	2	10	9.5	F	6	19.7	C	
A112	SR 84/Thornton(Fre)-WB	Fremont	I-880 SB	Fre	1.26	II	S	3	10	23.4	C	6	13.3	E	
A113	SR 84/Thornton (Fre)-EB	I-880 SB	Fremont	Fre	1.26	II	S	3	8	25.3	B	6	21.4	C	
A114	SR 84/Fremont (Fre)-EB	Thornton	Peralta	Fre	0.32	II	S	2	8	11.8	E	6	6.3	F	
A115	SR 84/Peralta (Fre) - EB	Fremont	Mowry	Fre	1.64	I	S	1	8	25.1	C	6	24.7	C	
A116	SR 84/Mowry (Fre) - EB	Peralta	SH 238	Fre	0.86	I	S	2	6	20.9	D	6	27.6	C	
A117	1st Street - SB	I-580 Off	N Mines	Liv	0.60	I	E	3	8	25.1	C	7	19.9	D	
A118	1st Street - SB	N Mines	Inman	Liv	1.06	I	E	2	8	29.0	B	7	30.7	B	
A119	1st Street - NB	Inman	N Mines	Liv	1.06	I	E	2	8	31.7	B	7	31.5	B	
A120	1st Street - NB	N Mines	I-580 Off	Liv	0.60	I	E	3	8	30.2	B	7	15.8	E	
A121	SR 84 - EB	SR 238/Mission	Union City Limit	Fre	1.35	41.9	S	1	6	38.9	A	6	44.1	A	[3]
A122	SR 84 - EB	Union City Limit	Palomares	Fre	0.86	44.5	S	1	6	42.6	A	6	47.4	A	
A123	SR 84 - EB	Palomares	Niles Cnyn Quarry	Fre	2.16	43.8	S	1	6	40.7	A	6	45.9	A	
A124	SR 84 - EB	Niles Cnyn Quarry	Sunol Rd	Fre	1.74	46.7	S	1	6	44.8	A	6	50.0	A	
A125	SR 84 - EB	Sunol Rd	Ple-Sunol Rd	Fre	0.55	27.6	S	1	6	9.3	F	6	11.8	F	
A126	SR 84 - EB	Ple-Sunol Rd	SR 84 (Off)/I-680	Uninc	0.80	42.9	E	1	8	40.3	A	6	36.7	B	
A127	SR 84 - EB	SR 84 (Off)/I-680	Vallecitos Ln	Uninc	1.05	50.8	E	1	8	48.1	A	6	44.6	B	
A128	SR 84 - EB	Vallecitos Ln	Vallecitos Nuc.Cntr	Uninc	1.13	57.5	E	1	8	53.6	A	6	56.1	A	
A129	SR 84 - EB	Vallecitos Nuc Center Ent.	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.66	58.3	E	1	8	55.2	A	6	53.5	A	
A130	SR 84 - EB	Culvert (Lat/Long: 37.613854,-121.817224)	Ruby Hill /Kaithoff	Uninc	1.63	59.2	E	2	8	55.7	A	6	60.3	A	
A131	SR 84 - EB	Ruby Hill./Kaithoff	Isabel/Vallecitos	Liv	0.38	I	E	1	8	38.5	A	6	39.2	A	

Appendix B. 2014 Level of Service Results

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A132	SR 84 (Liv) - NB	Isabel/Vallecitos	Vineyard	Liv	1.12	I	E	1	8	41.8	A	6	35.5	A	
A133	SR 84 (Liv) - NB	Vineyard	Concannon	Liv	0.60	I	E	1	8	32.3	B	6	43.3	A	
A134	SR 84 (Liv) - NB	Concannon	Stanley	Liv	1.05	I	E	1	8	37.1	A	6	29.2	B	
A135	SR 84 (Liv) - NB	Stanley	W. Jack London Blvd.	Liv	0.90	I	E	1	8	38.4	A	6	44.4	A	
A136	SR 84 (Liv) - NB	W. Jack London Blvd.	Airway/Kitty Hawk	Liv	0.49	I	E	3	8	17.6	D	6	30.4	B	
A137	Airway Blvd (old SR 84) - NB	SR 84	I-580 EB off ramp	Liv	1.06	I	E	1	8	32.6	B	6	26.0	B	
A138	Airway Blvd (old SR 84) - SB	I-580 EB off ramp	SR 84	Liv	1.06	I	E	1	6	34.1	B	6	31.0	A	
A139	SR 84 (Liv) - SB	Airway/Kitty	W. Jack London Blvd.	Liv	0.49	I	E	3	6	32.3	B	6	18.7	D	
A140	SR 84 (Liv) - SB	W. Jack London Blvd.	Stanley	Liv	0.90	I	E	1	6	45.7	A	6	29.4	B	
A141	SR 84 (Liv) - SB	Stanley	Concannon	Liv	1.05	I	E	1	6	36.0	A	6	37.7	A	
A142	SR 84 (Liv) - SB	Concannon	Vineyard	Liv	0.60	I	E	1	6	28.0	C	6	28.4	B	
A143	SR 84 (Liv) - SB	Vineyard	Isabel/Vallecitos	Liv	1.12	I	E	1	6	14.6	E	6	14.9	E	
A144	SR 84 - WB	Isabel/Vallecitos	Ruby Hill /Kaithoff	Liv	0.38	I	E	1	6	36.5	A	6	24.3	C	
A145	SR 84 - WB	Ruby Hill /Kaithoff	Culvert (Lat/Long: 37.613854,-121.817224)	Uninc	1.63	55.8	E	2	6	18.1	F	6	16.0	F	
A146	SR 84 - WB	Culvert (Lat/Long: 37.613854,-121.817224)	Vallecitos Nuc.Cntr	Uninc	1.65	56.5	E	1	6	41.8	C	6	29.4	E	
A147	SR 84 - WB	Vallecitos Nuc.Cntr	Vallecitos Ln	Uninc	1.14	52.5	S	1	6	51.3	A	6	50.4	A	
A148	SR 84 - WB	Vallecitos Ln	SR 84/I-680 On	Uninc	0.86	55.3	S	1	6	54.7	A	6	45.5	A	[3]
A149	SR 84 - WB	SR 84/I-680 On	Ple-Sunol Rd	Uninc	0.62	41.4	S	1	8	34.6	B	6	32.8	C	[3]
A150	SR 84 - WB	Ple-Sunol Rd	Sunol Rd	Fre	0.55	41.9	S	1	8	41.7	A	6	43.6	A	
A151	SR 84 - WB	Sunol Rd	Niles Canyon Quarry	Fre	1.74	48.5	S	1	8	47.7	A	6	47.1	A	
A152	SR 84 - WB	Niles Canyon Quarry	Eastern Fremont City Limit	Fre	1.00	47.5	S	1	8	47.6	A	6	45.2	A	
A153	SR 84 - WB	Eastern Fremont City Limit	Union City Limit	Fre	2.03	41.8	S	1	8	44.6	A	6	33.9	B	
A154	SR 84 - WB	Union City Limit	SR 238	Fre	1.35	31.7	S	1	8	24.4	C	6	22.9	C	
A155	SR 92 - EB	I-880	Mission	Hay	1.71	II	C	3	7	18.8	C	6	25.5	B	
A156	SR 92 - WB	Mission	I-880	Hay	1.71	II	C	3	6	19.1	C	6	12.5	E	
A157	SR 112 (Davis) - EB	Doolittle	I-880	San L	0.52	II	C	2	8	23.5	C	6	15.9	D	[1]
A158	SR 112 (Davis) - EB	I-880	San Leandro	San L	0.99	II	C	2	8	22.3	C	6	18.0	D	[1]
A159	SR 112 (Davis) - EB	San Leandro	14th	San L	0.28	III	C	2	8	15.4	C	6	16.2	C	[1]

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A160	SR 112 (Davis) - WB	E 14th	San Leandro	San L	0.28	III	C	2	7	12.9	D	6	6.3	F	[1]
A161	SR 112 (Davis) - WB	San Leandro	I-880	San L	0.99	II	C	2	7	29.3	B	6	19.6	C	[1]
A162	SR 112 (Davis) - WB	I-880	Doolittle	San L	0.52	II	C	2	7	21.1	C	6	15.2	D	[1]
A163	SR 123 San Pablo - SB	Carlson	Washington	Alb	0.51	II	N	2	6	24.3	B	6	17.4	D	
A164	SR 123 San Pablo - SB	Washington	Marin	Alb	0.36	III	N	2	6	15.5	C	6	10.4	D	
A165	SR 123 San Pablo - SB	Marin	Gilman	Alb, Berk	0.45	II	N	2	6	24.6	B	6	20.0	C	
A166	SR 123 San Pablo - SB	Gilman	University	Berk	0.81	II	N	2	6	16.6	D	6	19.4	C	
A167	SR 123 San Pablo - SB	University	Allston	Berk	0.19	III	N	2	6	29.0	A	6	16.1	C	
A168	SR 123 San Pablo - SB	Allston	Dwight	Berk	0.38	II	N	2	6	22.3	C	6	23.0	C	
A169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	0.64	II	N	2	6	23.2	C	6	19.0	C	
A170	SR 123 San Pablo - SB	Ashby	Stanford	Oak	0.80	II	N	2	6	22.5	C	6	21.0	C	
A171	SR 123 San Pablo - SB	Stanford	53rd	Oak	0.27	II	N	2	6	21.2	C	6	15.1	D	
A172	SR 123 San Pablo - SB	53rd	Park	Emery	0.34	II	N	2	6	19.6	C	6	28.7	B	
A173	SR 123 San Pablo - SB	Park	35th	Emery, Oak	0.44	II	N	2	6	18.3	C	6	21.9	C	
A174	SR 123 San Pablo - NB	35th	Park	Oak, Emery	0.42	II	N	2	7	16.3	D	7	14.7	D	
A175	SR 123 San Pablo - NB	Park	53rd	Emery	0.34	II	N	2	7	23.6	C	7	24.3	B	
A176	SR 123 San Pablo - NB	53rd	Stanford	Oak	0.27	II	N	2	7	33.5	A	7	21.0	C	
A177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	0.80	II	N	2	7	20.6	C	7	17.8	D	
A178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	0.64	II	N	2	7	28.4	B	7	20.7	C	
A179	SR 123 San Pablo - NB	Dwight	Allston	Berk	0.38	II	N	2	7	30.9	A	7	23.4	C	
A180	SR 123 San Pablo - NB	Allston	University	Berk	0.19	III	N	2	7	21.8	B	7	9.0	E	
A181	SR 123 San Pablo - NB	University	Gilman	Berk	0.81	II	N	2	7	26.7	B	7	20.1	C	
A182	SR 123 San Pablo - NB	Gilman	Marin	Alb, Berk	0.45	II	N	2	7	32.5	A	7	22.1	C	
A183	SR 123 San Pablo - NB	Marin	Washington	Alb	0.36	III	N	2	7	24.8	B	7	14.8	C	[3]
A184	SR 123 San Pablo - NB	Washington	Carlson	Alb	0.51	II	N	2	7	28.3	B	7	24.4	B	
A185	SR 185 (International Blvd) - SB	42nd	46th St	Oak	0.29	II		2	6	21.9	C	6	11.6	E	
A186	SR 185 (International Blvd) - SB	46th St	Seminary	Oak	0.78	II		2	6	29.6	B	6	24.3	B	
A187	SR 185 (International Blvd) - SB	Seminary	73rd	Oak	0.80	II	N	2	6	12.1	E	6	21.1	C	

Appendix B. 2014 Level of Service Results

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A188	SR 185 (International Blvd) - SB	73rd Ave	98th Ave	Oak	1.41	II	N	2	6	21.8	C	6	23.3	C	
A189	SR 185 (International Blvd) - SB	98th	Broadmoor	Oak	0.75	II	N	2	6	24.5	B	6	21.9	C	
A190	SR 185 (14th) - SB	Broadmoor	Davis	San L	0.73	II	C	2	7	22.1	C	6	29.9	B	
A191	SR 185 (14th) - SB	Davis	San Leandro	San L	1.06	III	C	2	7	21.8	B	6	19.0	C	
A192	SR 185 (14th) - SB	San L Blvd	Hesperian	San L	0.94	II	C	2	7	22.5	C	6	31.2	A	
A193	SR 185 (14th) - SB	Hesperian	Bayfair	San L	0.47	II	C	2	7	28.9	B	6	17.3	D	
A194	SR 185 (14th) - SB	Bayfair	170th	Uninc	1.19	II	S	2	6	25.1	B	6	12.5	E	
A195	SR 185 (14th) - SB	170th	Llewelling	Uninc	0.20	II	S	2	6	25.2	B	6	27.3	B	
A196	SR 185 (14th) - SB	Llewelling	Sunset	Uninc	1.05	II	S	2	6	23.4	C	6	16.4	D	
A197	SR 185 Hayward - SB	Sunset	SR 92/238	Hay	0.84	III	C	2	6	12.8	D	6	14.9	C	
A198	SR 185 Hayward - NB	A Street (SR 92/238 until 2012)	Sunset	Hay	0.43	III	C	2	6	17.0	C	6	12.8	D	[2]
A199	SR 185 (14th) - NB	Sunset	Llewelling	Uninc	1.05	II	S	2	6	25.5	B	6	21.3	C	
A200	SR 185 (14th) - NB	Llewelling	170th	Uninc	0.20	II	S	2	6	22.5	C	6	28.8	B	
A201	SR 185 (14th) - NB	170th	Bayfair	Uninc	1.19	II	S	2	6	26.4	B	6	25.9	B	
A202	SR 185 (14th) - NB	Bayfair	Hesperian	San L	0.47	II	C	2	7	26.0	B	6	33.3	A	
A203	SR 185 (14th) - NB	Hesperian	San L Blvd	San L	0.94	II	C	2	7	23.7	C	6	31.7	A	
A204	SR 185 (14th) - NB	San Leandro	Davis	San L	1.06	III	C	1	7	19.3	B	6	19.8	B	
A205	SR 185 (14th) - NB	Davis	Broadmoor	San L	0.73	II	C	2	7	23.5	C	6	25.7	B	
A206	SR 185 (International Blvd) - NB	Broadmoor	98th	Oak	0.75	II	N	2	5	16.0	D	6	23.7	C	
A207	SR 185 (International Blvd) - NB	98th Ave	73rd Ave	Oak	1.41	II	N	2	5	20.2	C	6	16.2	D	
A208	SR 185 (International Blvd) - NB	73rd Ave	Seminary	Oak	0.80	II	N	2	5	10.8	E	6	11.4	E	
A209	SR 185 (International Blvd) - NB	Seminary	46th St	Oak	0.78	II		2	5	29.8	B	6	25.0	B	
A210	SR 185 (International Blvd) - NB	46th St	42nd	Oak	0.29	II		2	5	8.8	F	6	16.5	D	
A211	SR 238 (Foothill) - NB	Jackson	City Center	Hay	0.63	III	C	4	7	10.6	D	6	19.8	B	

Table B-7: 2014 LOS Monitoring Results for Arterials (Tier 1) - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Class	Plan Area	# Lanes	2012 Results			2014 Results			Note
		From	To						# Runs	Speed	LOS	# Runs	Speed	LOS	
A212	SR 238 (Foothill) - NB	City Center	I-580	Hay	0.73	II	S	3	7	19.5	C	6	25.9	B	
A213	SR 238 (Foothill) - NB	I-580 Ramp	I-580 Merge	Uninc	0.68	I	S	1	7	48.0	A	6	39.6	A	
A214	SR 238 (Foothill) - SB	I-580	Cstro V Blvd	Uninc	0.73	I	S	3	6	46.4	A	6	53.7	A	[3]
A215	SR 238 (Foothill) - SB	Cstro V Blvd	City Center	Hay, Uninc	1.04	II	C	3	6	23.8	C	6	23.3	C	
A216	SR 238 (Foothill) - SB	City Center	A Street	Hay	0.16	III	C	3	6	11.3	D	6	32.3	A	[2]
A217	SR 238 (Mission) - NB	680 NB Rmp	Stevenson	Fre	2.35	I	S	2	6	37.2	A	6	35.4	A	
A218	SR 238 (Mission) - NB	Stevenson	Nursery	Fre	2.43	I	S	2	6	38.2	A	6	36.1	A	
A219	SR 238 (Mission) - NB	Nursery	Tamarack	Uni Cty	2.63	I	S	3	6	29.8	B	6	35.7	A	[3]
A220	SR 238 (Mission) - NB	Tamarack	Industrial	Uni Cty, Hay	1.96	I	S	3	6	31.8	B	6	29.0	B	
A221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	1.46	II	C	2	6	24.4	B	6	28.6	B	
A222	SR 238 (Mission) - NB	Sorenson	Jackson	Hay	1.83	II	C	2	6	20.2	C	6	31.1	A	
A223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	1.83	II	C	2	6	18.1	C	6	25.4	B	
A224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	1.46	II	C	2	6	20.4	C	6	27.6	B	
A225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay, Uni Cty	1.96	I	C	3	6	31.7	B	6	28.0	B	
A226	SR 238 (Mission) - SB	Tamarack	Nursery	Uni Cty	2.63	I	S	3	6	22.5	C	6	33.2	B	[3]
A227	SR 238 (Mission) - SB	Nursery	Stevenson	Fre	2.43	I	S	2	6	29.8	B	6	22.6	C	
A228	SR 238 (Mission) - SB	Stevenson	680 NB Rmp	Fre	2.35	I	S	2	6	28.5	B	6	15.8	E	
A229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	1.35	I	N	2	7	18.0	C	6	25.9	A	
A230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	1.43	I	N	2	8	15.4	C	6	33.0	A	[3]
A231	SR 262 (Mission) - EB	I-880 NB	I-680 NB	Fre	1.48	I	S	2	6	28.7	B	6	33.9	B	
A232	SR 262 (Mission) - WB	I-680 NB	I-880 SB	Fre	1.67	I	S	2	6	21.6	D	6	11.6	F	[3]
A233	SR 84 (Liv) - NB - realign	Airway	I-580 WB (off)	Liv	0.52	I	E	3	New Segment - SR 84 Realignment			6	29.9	B	
A234	SR 84 (Liv) - NB - realign	I-580 WB (off)	Airway)	Liv	0.53	I	E	3				6	26.2	C	

Comments

[1] Data impacted by long term construction and recurrent lane closures

[2] Part of this CMP segment is converted to a one way street in the other direction. CMP segment is now shortened

[3] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

B.4 | Arterials (Tier 2)

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T1	W.Grand Ave - Grand Ave - EB	I-80/Maritime St	San Pablo Ave	Oak	1.63	N	26.6	2 / 3	14.2	D / D	INRIX Data	779	25.8	B / B	[2]
T2	W.Grand Ave - Grand Ave - EB	San Pablo Ave	Broadway	Oak	0.40	N	19.9	3 / 4	10.8	D / D	INRIX Data	2504	16.6	C / C	
T3	W.Grand Ave - Grand Ave - EB	Broadway	I-580	Oak	1.08	N	21.6	3 / 4	24.3	B / B	INRIX Data	1546	16.4	C / C	[2]
T4	W.Grand Ave - Grand Ave - WB	I-580	Broadway	Oak	1.08	N	21.5	3 / 4	23.9	B / B	INRIX Data	852	18.9	C / C	
T5	W.Grand Ave - Grand Ave - WB	Broadway	San Pablo Ave	Oak	0.40	N	20.8	3 / 4	12.0	D / D	INRIX Data	1682	17.1	C / C	
T6	W.Grand Ave - Grand Ave - WB	San Pablo Ave	I-80/Maritime St	Oak	1.63	N	28.3	2 / 3	11.4	E / E	INRIX Data	983	25.9	B / B	[2]
T7	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	I-980 ON Ramp/Brush St	Webster	Oak	0.60	N	14.4	3 / 4	17.8	C / C	Floating Car	6	15.1	C / C	
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	Webster	East side of Lake Merritt Channel	Oak	0.66	N	14.7	3 / 4	20.7	B / B	Floating Car	6	16.8	C / C	
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	1.15	N	16.7	3 / 4	17.0	C / C	Floating Car	7	15.6	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	N	16.8	3 / 4	17.7	C / C	Floating Car	7	15.8	C / C	
T11	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	East side of Lake Merritt Channel	Webster	Oak	0.64	N	15.9	3 / 4	24.3	B / B	Floating Car	8	19.3	B / B	
T12	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oak	0.60	N	17.4	3 / 4	14.2	C / C	Floating Car	8	17.1	C / C	
T13	Telegraph Ave-NB	51st Street	Russell St	Oak, Berk	1.41	N	15.0	3 / 4	16.8	C / C	Floating Car	6	14.9	C / C	
T14	Telegraph Ave-NB	Russell St	Bancroft Way	Berk	0.77	N	13.5	3 / 4	15.6	C / C	Floating Car	6	17.4	C / C	
T15	Telegraph Ave-SB	Bancroft Way	Russell St	Berk	0.90	N	13.9	3 / 4	10.4	D / D	Floating Car	6	15.2	C / C	[2]
T16	Telegraph Ave-SB	Russell St	51st Street	Oak, Berk	1.41	N	18.5	3 / 4	16.0	C / C	Floating Car	6	16.9	C / C	
T17	Broadway-EB	Broadway/College Ave	Grand Ave	Oak	1.91	N	20.8	2 / 3	14.3	D / D	INRIX Data	367	17.6	D / D	
T18	Broadway-EB	Grand Ave	14th St	Oak	0.55	N	18.2	3 / 4	10.4	D / D	INRIX Data	1186	16.8	C / C	

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T19	Broadway-EB	14th St	5th St/Broadway	Oak	0.48	N	17.9	3 / 4	8.3	E / E	INRIX Data	1487	14.0	C / C	
T20	Broadway (Connection to I-880)-SB	5th St/Broadway	I-880 ON Ramp	Oak	0.21	N	62.9	1 / 1	11.3	F / F	INRIX Data	3779	14.9	E / F	[2]
T21	Broadway (Connection to I-880)-NB	I-880 OFF Ramp	5th St/Broadway	Oak	1.26	N	23.0	1 / 2	23.0	C / C	Floating Car	6	15.0	E / E	[2]
T22	Broadway-WB	5th St/Broadway	14th St	Oak	0.48	N	17.1	3 / 4	12.5	D / D	INRIX Data	1265	15.0	C / C	
T23	Broadway-WB	14th St	Grand Ave	Oak	0.55	N	18.3	3 / 4	16.0	C / C	INRIX Data	1181	16.7	C / C	
T24	Broadway-WB	Grand Ave	Broadway/College Ave	Oak	1.91	N	21.9	2 / 3	15.7	D / D	INRIX Data	995	16.2	D / D	
T25	Durant-EB	Shattuck	College Ave.	Berk	0.73	N	16.0	3 / 4	10.7	D / D	Floating Car	6	13.4	C / C	
T26	College Avenue-SB	Bancroft Way/College Ave	Ashby Ave	Berk	0.85	N	16.8	3 / 4	10.3	D / D	INRIX Data	951	13.2	C / C	
T27	College Avenue-SB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oak, Berk	0.83	N	19.7	3 / 4	11.2	D / D	INRIX Data	436	14.8	C / C	
T28	College Avenue-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Oak	0.61	N	16.7	3 / 4	16.1	C / C	INRIX Data	864	15.4	C / C	
T29	College Avenue-NB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Oak	0.61	N	17.0	3 / 4	12.5	D / D	INRIX Data	832	15.2	C / C	
T30	College Avenue-NB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oak, Berk	0.83	N	18.3	3 / 4	15.9	C / C	INRIX Data	569	15.5	C / C	
T31	College Avenue-NB	Ashby Ave	Bancroft Way/College Ave	Berk	0.85	N	16.8	3 / 4	16.1	C / C	INRIX Data	656	15.2	C / C	
T32	Bancroft-WB	College Ave.	Shattuck	Berk	0.73	N	12.5	3 / 4	14.8	C / C	Floating Car	6	9.9	D / D	
T33	51st Street-EB	SR 24 Off Ramp/52nd St	Broadway	Oak	0.75	N	15.0	3 / 4	12.5	D / D	Floating Car	6	12.9	D / D	
T34	51st Street-WB	Broadway	SR 24 Off Ramp/52nd St	Oak	0.75	N	15.7	3 / 4	10.7	D / D	Floating Car	6	17.1	C / C	
T35	Shattuck Avenue-NB	51st	Alcatraz Ave.	Oak, Berk	0.81	N	22.8	3 / 4	20.3	B / B	Floating Car	7	18.2	C / C	
T36	Shattuck Avenue-NB	Alcatraz Ave.	Adeline St.	Berk	0.70	N	16.7	3 / 4	13.8	C / C	Floating Car	7	11.9	D / D	
T37	Shattuck Avenue-SB	Adeline St.	Alcatraz Ave.	Berk	0.70	N	17.1	3 / 4	13.1	C / C	Floating Car	6	10.6	D / D	
T38	Shattuck Avenue-SB	Alcatraz Ave.	51st	Oak	0.81	N	17.3	3 / 4	13.2	C / C	Floating Car	6	18.5	C / C	
T39	Powel Street-Stanford Avenue-EB	NB I-80 OFF Ramp	San Pablo Ave	Emery	0.75	N	15.5	2 / 3	14.3	D / D	Floating Car	7	20.3	C / C	

Appendix B. 2014 Level of Service Results

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results		Note	
		From	To						Speed	LOS 85/00	Method	Sample	Speed		LOS 85/00
T40	Powel Street-Stanford Avenue-EB	San Pablo Ave	MLK Jr Way	Oak, Berk	0.76	N	17.0	2 / 3	16.1	D / D	Floating Car	7	17.2	D / D	
T41	Powel Street-Stanford Avenue-WB	MLK Jr Way	San Pablo Ave	Oak, Berk	0.76	N	19.1	2 / 3	17.2	D / D	Floating Car	7	20.8	C / C	
T42	Powel Street-Stanford Avenue-WB	San Pablo Ave	NB I-80 OFF Ramp	Emery, Oak	0.75	N	15.3	2 / 3	17.6	D / D	Floating Car	7	14.0	D / D	
T43	40thStreet-Shellmound Avenue-EB	Shellmound Way (north of Powell St)	40th St	Emery	0.73	N	24.6	2 / 3	20.1	C / C	Floating Car	6	17.9	D / D	
T44	40thStreet-Shellmound Avenue-EB	40th St	San Pablo Ave	Emery	0.68	N	16.5	3 / 4	12.4	D / D	Floating Car	6	12.4	D / D	
T45	40thStreet-Shellmound Avenue-WB	San Pablo Ave	40th St	Emery	0.68	N	22.0	3 / 4	20.1	B / B	Floating Car	6	24.7	B / B	
T46	40thStreet-Shellmound Avenue-WB	40th St	Shellmound Way (north of Powell St)	Emery	0.73	N	29.0	2 / 3	22.3	C / C	Floating Car	6	21.3	C / C	
T47	International Boulevard-NB	42nd Ave	Fruitvale Ave	Oak	0.62	N	21.9	3 / 4	14.1	C / C	INRIX Data	1287	16.8	C / C	
T48	International Boulevard-NB	Fruitvale Ave	14th Ave	Oak	1.38	N	22.9	3 / 4	21.5	B / B	INRIX Data	979	21.5	B / B	
T49	International Boulevard-NB	14th Ave	Lake Merritt Blvd	Oak	0.88	N	22.5	3 / 4	17.5	C / C	INRIX Data	1218	20.7	B / B	
T50	International Boulevard-SB	Lake Merritt Blvd	14th Ave	Oak	0.88	N	21.5	3 / 4	22.5	B / B	INRIX Data	2067	20.3	B / B	
T51	International Boulevard-SB	14th Ave	Fruitvale Ave	Oak	1.38	N	22.9	3 / 4	18.7	C / C	INRIX Data	2535	19.4	B / B	
T52	International Boulevard-SB	Fruitvale Ave	42nd Ave	Oak	0.62	N	21.4	3 / 4	8.0	E / E	INRIX Data	2868	12.5	D / D	
T53	73rd Ave--NB	International Blvd/73rd Ave	73rd Ave/Foothill Blvd	Oak	1.07	N	28.1	2 / 3	14.0	E / E	INRIX Data	695	23.0	C / C	
T54	Foothill Boulevard-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oak	1.02	N	20.3	3 / 4	19.1	B / B	INRIX Data	302	21.4	B / B	
T55	Foothill Boulevard-NB	Seminary Ave	High Street	Oak	1.22	N	21.5	3 / 4	20.5	B / B	INRIX Data	332	21.2	B / B	
T56	Foothill Boulevard-NB	High Street	Fruitvale Ave	Oak	0.90	N	19.8	3 / 4	14.0	C / C	INRIX Data	431	17.5	C / C	
T57	Foothill Boulevard-NB	Fruitvale Ave	14th Ave	Oak	1.32	N	22.9	2 / 3	20.4	C / C	INRIX Data	226	23.7	C / C	
T58	Foothill Boulevard-NB	14th Ave	1st Ave/Lake Shore Blvd	Oak	0.88	N	20.5	3 / 4	16.9	C / C	INRIX Data	555	19.8	B / B	
T60	Foothill Boulevard-SB	14th Ave	Fruitvale Ave	Oak	1.32	N	21.8	2 / 3	17.2	D / D	INRIX Data	129	20.4	C / C	
T61	Foothill Boulevard-SB	Fruitvale Ave	High Street	Oak	0.90	N	20.8	3 / 4	14.1	C / C	INRIX Data	498	16.3	C / C	
T62	Foothill Boulevard-SB	High Street	Seminary Ave	Oak	1.22	N	20.2	3 / 4	18.2	C / C	INRIX Data	590	19.7	B / B	
T63	Foothill Boulevard-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	1.02	N	21.2	3 / 4	17.4	C / C	INRIX Data	355	20.3	B / B	

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T64	73rd Ave--SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oak	1.07	N	26.9	2 / 3	21.2	C / C	INRIX Data	738	23.8	C / C	
T65	E. 15th Street-SB	1st Avenue	14th Avenue	Oak	0.98	N	14.8	3 / 4	16.9	C / C	Floating Car	6	14.5	C / C	
T66	High Street-EB	Otis Drive	Central Ave	Ala	0.58	N	19.7	3 / 4	21.0	B / B	Floating Car	6	16.9	C / C	
T67	High Street-EB	Central Ave	Fernside Blvd	Ala	0.48	N	19.3	3 / 4	16.4	C / C	Floating Car	6	14.3	C / C	
T68	High Street-EB	Fernside Blvd	NB I-880 OFF Ramp	Ala, Oak	0.50	N	14.8	2 / 3	13.3	E / E	Floating Car	6	9.7	F / F	
T69	High Street-EB	NB I-880 OFF Ramp	Foothill Blvd	Oak	0.61	N	16.3	3 / 4	11.3	D / D	Floating Car	6	11.5	D / D	
T70	High Street-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oak	1.29	N	20.9	3 / 4	17.2	C / C	Floating Car	6	15.9	C / C	
T71	High Street-WB	MacArthur Blvd/WB I-580 OFF Ramp	Foothill Blvd	Oak	1.29	N	21.2	3 / 4	22.8	B / B	Floating Car	6	13.8	C / C	[2]
T72	High Street-WB	Foothill Blvd	NB I-880 OFF Ramp	Oak	0.61	N	16.9	3 / 4	9.2	D / D	Floating Car	6	10.4	D / D	
T73	High Street-WB	NB I-880 OFF Ramp	Fernside Blvd	Ala, Oak	0.50	N	21.6	2 / 3	18.9	C / C	Floating Car	6	14.3	D / D	
T74	High Street-WB	Fernside Blvd	Central Ave	Ala	0.48	N	16.8	3 / 4	19.5	B / B	Floating Car	6	19.6	B / B	
T75	High Street-WB	Central Ave	Otis Drive	Ala	0.58	N	24.5	3 / 4	15.1	C / C	Floating Car	6	17.5	C / C	
T76	Crow Canyon Road/Grove Way-NB	A Street/Redwood Road	EB I-580 ON Ramp/Grove Way	Ala Cnty	0.95	C	29.0	2 / 3	31.5	A / A	INRIX Data	1987	24.3	B / B	
T77	Crow Canyon Road/Grove Way-NB	EB I-580 ON Ramp/Grove Way	Cull Canyon	Ala Cnty	0.81	C	32.1	1 / 2	26.0	C / C	INRIX Data	2288	25.9	C / C	
T78	Crow Canyon Road-NB	Cull Canyon	Cold Water Dr	Ala Cnty	0.88	C	42.3	1 / 2	38.4	A / A	INRIX Data	2106	39.2	A / A	
T79	Crow Canyon Road-NB	Cold Water Dr	0.43 miles north of Norris Canyon Rd	Ala Cnty	2.41	C	42.0	Rural	40.8	A / -	INRIX Data	3039	38.9	A / -	[2]
T80	Crow Canyon Road-NB	0.43 miles north of Norris Canyon Rd	County Line	Ala Cnty	2.97	C	42.0	Rural	45.1	A / -	INRIX Data	3708	39.0	A / -	[2]
T81	Crow Canyon Road-SB	County Line	0.43 miles north of Norris Canyon Rd	Ala Cnty	2.97	C	41.4	Rural	41.7	A / -	INRIX Data	3728	38.6	A / -	[2]
T82	Crow Canyon Road-SB	0.43 miles north of Norris Canyon Rd	Cold Water Dr	Ala Cnty	2.40	C	41.4	Rural	30.9	C / -	INRIX Data	3608	38.6	A / -	[2]
T83	Crow Canyon Road-SB	Cold Water Dr	Cull Canyon	Ala Cnty	0.89	C	41.6	1 / 2	26.8	C / C	INRIX Data	1631	38.0	A / A	
T84	Crow Canyon Road/Grove Way-SB	Cull Canyon	EB I-580 ON Ramp/Grove Way	Ala Cnty	0.82	C	36.1	1 / 2	24.5	C / C	INRIX Data	785	30.6	B / B	

Appendix B. 2014 Level of Service Results

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T85	Crow Canyon Road/Grove Way-SB	EB I-580 ON Ramp/Grove Way	A Street/Redwood Road	Ala Cnty	0.94	C	30.7	2 / 3	24.1	B / B	INRIX Data	427	27.2	B / B	
T86	Winton Avenue - D Street-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hay	0.39	C	25.7	2 / 3	19.6	C / C	INRIX Data	3612	16.6	D / D	
T87	Winton Avenue - D Street-EB	SB I-880 ON Ramp	Santa Clara St	Hay	0.35	C	33.5	2 / 3	21.7	C / C	INRIX Data	3031	20.7	C / C	
T88	Winton Avenue - D Street-EB	Santa Clara St	Soto Rd	Hay	0.55	C	24.1	2 / 3	13.0	E / E	INRIX Data	3337	18.1	C / C	
T89	Winton Avenue - D Street-EB	Soto Rd	Foothill Boulevard/D St	Hay	0.92	C	24.5	2 / 3	8.8	F / F	INRIX Data	1824	20.0	C / C	
T90	Winton Avenue - D Street-WB	Foothill Boulevard/D St	Soto Rd	Hay	0.92	C	27.2	2 / 3	16.2	D / D	INRIX Data	802	20.5	C / C	
T91	Winton Avenue - D Street-WB	Soto Rd	Santa Clara St	Hay	0.55	C	23.0	2 / 3	22.6	C / C	INRIX Data	2407	19.7	C / C	
T92	Winton Avenue - D Street-WB	Santa Clara St	SB I-880 ON Ramp	Hay	0.35	C	34.7	2 / 3	39.6	A / A	INRIX Data	1820	34.1	A / A	
T93	Winton Avenue - D Street-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hay	0.39	C	24.1	2 / 3	11.1	E / E	INRIX Data	3363	19.9	C / C	
T94	A Street-EB	Foothill Boulevard/A St	Redwood Rd/Grove Way	Hay, Ala Cnty	0.80	C	23.6	2 / 3	20.5	C / C	Floating Car	7	17.6	D / D	
T95	A Street-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Ala Cnty	0.42	C	18.5	2 / 3	23.2	C / C	Floating Car	7	15.8	D / D	
T96	A Street-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Ala Cnty	0.42	C	28.8	2 / 3	25.0	B / B	Floating Car	7	28.1	B / B	
T97	A Street-WB	Redwood Rd/Grove Way	Foothill Boulevard/A St	Ala Cnty	0.80	C	15.8	2 / 3	16.6	D / D	Floating Car	7	27.9	B / B	
T98	Hesperian Boulevard-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Uni Cty	0.98	S	26.5	1 / 2	21.6	D / D	Floating Car	6	15.2	E / E	
T99	Hesperian Boulevard-Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	0.30	S	32.9	1 / 2	22.9	C / C	Floating Car	6	13.5	E / E	
T100	Hesperian Boulevard-Union City Blvd-NB	Hesperian/Union City Blvd/overbridge	Industrial Blvd	Hay	0.57	S	26.4	1 / 2	14.4	E / E	Floating Car	6	22.2	C / C	
T101	Hesperian Boulevard-Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Hay	1.05	S	25.2	2 / 3	19.3	C / C	Floating Car	6	22.6	C / C	
T102	Hesperian Boulevard-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Hay	1.05	S	26.8	2 / 3	26.5	B / B	Floating Car	6	13.4	E / E	
T103	Hesperian Boulevard-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Hay	0.57	S	19.3	1 / 2	17.6	D / D	Floating Car	6	12.2	F / F	

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T104	Hesperian Boulevard-Union City Blvd-SB	Hesperian/Union City Blvd/overbridge	Whipple Rd	Uni Cty	0.30	S	22.1	1 / 2	29.9	B / B	Floating Car	6	15.4	E / E	
T105	Hesperian Boulevard-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Uni Cty	0.98	S	29.5	1 / 2	24.0	C / C	Floating Car	6	28.0	B / B	
T106	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Fre	0.22	S	30.6	1 / 2	25.8	C / C	INRIX Data	1536	28.0	B / B	
T107	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Uni Cty, Fre	1.42	S	32.4	1 / 2	22.6	C / C	INRIX Data	1233	28.3	B / B	
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Uni Cty	0.51	S	28.5	1 / 2	22.2	C / C	INRIX Data	327	26.7	C / C	
T109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Uni Cty	0.51	S	28.1	1 / 2	23.7	C / C	INRIX Data	1456	25.6	C / C	
T110	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Uni Cty, Fre	1.42	S	31.2	1 / 2	21.7	D / D	INRIX Data	1231	28.2	B / B	
T111	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Fre	0.22	S	31.6	1 / 2	23.4	C / C	INRIX Data	1934	25.5	C / C	
T112	Fremont Boulevard-NB	NB I-880 OFF Ramp	Automall Parkway	Fre	1.28	S	34.7	1 / 2	31.8	B / B	INRIX Data	2024	27.4	C / C	
T113	Fremont Boulevard-NB	Automall Parkway	Blacow Rd	Fre	0.91	S	34.2	1 / 2	32.7	B / B	INRIX Data	2263	31.9	B / B	
T114	Fremont Boulevard-NB	Blacow Rd	Adams Ave	Fre	0.38	S	28.0	1 / 2	34.5	B / B	INRIX Data	3591	23.2	C / C	
T115	Fremont Boulevard-NB	Adams Ave	Stevenson Rd	Fre	1.17	S	27.9	2 / 3	13.5	E / E	INRIX Data	2308	23.1	C / C	
T116	Fremont Boulevard-NB	Stevenson Rd	Mowry Ave	Fre	1.00	S	30.2	2 / 3	23.2	C / C	INRIX Data	1336	27.1	B / B	
T117	Fremont Boulevard-NB	Mowry Ave	Peralta Blvd	Fre	1.21	S	30.0	2 / 3	26.9	B / B	INRIX Data	1742	26.1	B / B	[1]
T118	Fremont Boulevard-NB	Peralta Blvd	Thornton Ave	Fre	0.33	S	30.9	2 / 3	19.8	C / C	INRIX Data	1724	24.0	B / B	
T119	Fremont Boulevard-NB	Thornton Ave	Decoto Rd	Fre	1.33	S	32.0	1 / 2	18.1	D / D	INRIX Data	1262	28.7	B / B	
T120	Fremont Boulevard-NB	Decoto Rd	Paseo Padre Pkwy	Fre	0.56	S	31.0	1 / 2	22.3	C / C	INRIX Data	2020	28.6	B / B	
T121	Fremont Boulevard-NB	Paseo Padre Pkwy	NB I-880 OFF Ramp	Fre	0.39	S	31.0	1 / 2	26.6	C / C	INRIX Data	1336	29.2	B / B	[2]
T122	Fremont Boulevard-SB	NB I-880 OFF Ramp	Paseo Padre Pkwy	Fre	0.39	S	32.0	1 / 2	19.1	D / D	INRIX Data	1110	29.6	B / B	
T123	Fremont Boulevard-SB	Paseo Padre Pkwy	Decoto Rd	Fre	0.56	S	29.7	1 / 2	19.7	D / D	INRIX Data	1563	27.9	C / C	
T124	Fremont Boulevard-SB	Decoto Rd	Thornton Ave	Fre	1.33	S	30.2	1 / 2	30.2	B / B	INRIX Data	1692	28.7	B / B	
T125	Fremont Boulevard-SB	Thornton Ave	Peralta Blvd	Fre	0.32	S	29.3	2 / 3	26.9	B / B	INRIX Data	2634	24.5	B / B	
T126	Fremont Boulevard-SB	Peralta Blvd	Mowry Ave	Fre	1.21	S	29.4	2 / 3	21.2	C / C	INRIX Data	2176	27.3	B / B	[1]
T127	Fremont Boulevard-SB	Mowry Ave	Stevenson Rd	Fre	1.00	S	32.3	2 / 3	27.8	B / B	INRIX Data	1896	30.0	A / A	

Appendix B. 2014 Level of Service Results

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T128	Fremont Boulevard-SB	Stevenson Rd	Adams Ave	Fre	1.17	S	27.8	2 / 3	23.4	C / C	INRIX Data	2423	24.8	B / B	[2]
T129	Fremont Boulevard-SB	Adams Ave	Blacow Rd	Fre	0.38	S	27.9	1 / 2	25.3	C / C	INRIX Data	3557	24.6	C / C	
T130	Fremont Boulevard-SB	Blacow Rd	Automall Parkway	Fre	0.91	S	33.1	1 / 2	26.5	C / C	INRIX Data	862	32.9	B / B	
T131	Fremont Boulevard-SB	Automall Parkway	NB I-880 OFF Ramp	Fre	1.28	S	34.9	1 / 2	37.7	A / A	INRIX Data	553	33.8	B / B	
T132	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fre	0.85	S	23.1	1 / 2	25.2	C / C	Floating Car	8	19.5	D / D	
T133	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fre	0.74	S	29.5	1 / 2	29.4	B / B	Floating Car	8	22.8	C / C	
T134	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fre	0.75	S	21.1	1 / 2	23.5	C / C	Floating Car	8	20.3	D / D	
T135	Automall Parkway-WB	Fremont Blvd	NB I-880 OFF Ramp	Fre	0.85	S	27.1	1 / 2	28.3	B / B	Floating Car	8	28.0	B / B	
T136	Vasco Road-NB	WB I-580 OFF Ramp	Scenic Ave	Liv	0.44	E	36.3	1 / 2	27.3	C / C	INRIX Data	3723	18.0	D / D	
T137	Vasco Road-NB	Scenic Ave	Dalton Ave/City-County Line	Liv	0.68	E	37.4	1 / 2	13.6	E / E	INRIX Data	3821	17.7	D / D	
T138	Vasco Road-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Liv	3.11	E	53.0	Rural	45.1	B / -	INRIX Data	3856	40.8	C / -	
T139	Vasco Road-NB	N. Vasco Rd/Vasco Rd	Local Road underpass/County Line	Liv	2.25	E	53.0	Rural	54.9	A / -	INRIX Data	3856	40.8	C / -	[2]
T140	Vasco Road-SB	Local Road underpass/County Line	N. Vasco Rd/Vasco Rd	Liv	2.25	E	46.8	Rural	56.4	A / -	INRIX Data	2985	53.1	A / -	
T141	Vasco Road-SB	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Liv	3.11	E	46.8	Rural	51.1	A / -	INRIX Data	2985	53.1	A / -	
T142	Vasco Road-SB	Dalton Ave/City-County Line	Scenic Ave	Liv	0.68	E	34.3	1 / 2	30.4	B / B	INRIX Data	2641	32.6	B / B	
T143	Vasco Road-SB	Scenic Ave	WB I-580 OFF Ramp	Liv	0.44	E	32.0	1 / 2	24.1	C / C	INRIX Data	1569	32.9	B / B	
T144	Dublin Blvd.-EB	San Ramon Road	Village Parkway	Dub	0.73	E	26.5	2 / 3	25.3	B / B	INRIX Data	993	20.6	C / C	
T145	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dub	0.81	E	29.5	2 / 3	16.3	D / D	INRIX Data	2209	24.9	B / B	
T146	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dub	1.21	E	34.1	1 / 2	29.8	B / B	INRIX Data	2187	28.8	B / B	
T147	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dub	0.89	E	30.2	1 / 2	22.3	C / C	INRIX Data	1592	25.2	C / C	
T148	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dub	0.89	E	29.1	1 / 2	26.2	C / C	INRIX Data	462	25.7	C / C	
T149	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dub	1.21	E	32.8	1 / 2	23.1	C / C	INRIX Data	885	28.0	B / B	
T150	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dub	0.81	E	29.5	2 / 3	22.1	C / C	INRIX Data	2770	23.6	C / C	
T151	Dublin Blvd.-WB	Village Parkway	San Ramon Road	Dub	0.73	E	24.5	2 / 3	15.9	D / D	INRIX Data	588	21.4	C / C	

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T152	San Ramon Road-NB	WB I-580 OFF ramp	Silvergate Dr	Dub	0.64	E	30.8	1 / 2	22.7	C / C	INRIX Data	1201	26.6	C / C	
T153	San Ramon Road-NB	Silvergate Dr	Alcosta Blvd/Westside Dr/County Line	Dub	0.99	E	35.1	1 / 2	29.3	B / B	INRIX Data	2194	33.5	B / B	
T154	San Ramon Road-SB	Alcosta Blvd/Westside Dr/County Line	Silvergate Dr	Dub	0.99	E	35.8	1 / 2	33.1	B / B	INRIX Data	2171	35.1	A / A	
T155	San Ramon Road-SB	Silvergate Dr	WB I-580 OFF ramp	Dub	0.64	E	32.7	1 / 2	18.0	D / D	INRIX Data	810	29.9	B / B	
T156	Dougherty Road-NB	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dub	1.12	E	35.4	1 / 2	20.3	D / D	INRIX Data	2844	28.1	B / B	[1]
T157	Dougherty Road-NB	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dub	0.80	E	44.1	1 / 2	43.0	A / A	INRIX Data	1953	43.6	A / A	
T158	Dougherty Road-SB	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dub	0.80	E	43.1	1 / 2	30.4	B / B	INRIX Data	2386	39.4	A / A	
T159	Dougherty Road-SB	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dub	1.12	E	33.1	1 / 2	25.7	C / C	INRIX Data	2351	27.1	C / C	[1]
T160	Tassajara Road-NB	WB I-580 OFF ramp	Central Parkway	Dub	0.49	E	24.7	1 / 2	24.9	C / C	Floating Car	6	14.6	E / E	
T161	Tassajara Road-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dub	0.68	E	34.3	1 / 2	34.9	B / B	Floating Car	6	19.2	D / D	
T162	Tassajara Road-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dub	1.04	E	38.4	1 / 2	36.3	A / A	Floating Car	6	31.1	B / B	
T163	Tassajara Road-NB	Fallon Rd	County Line	Ala Cnty	0.51	E	35.2	1 / 1	38.9	A / B	Floating Car	6	34.5	B / B	
T164	Tassajara Road-SB	County Line	Fallon Rd	Ala Cnty	0.51	E	45.2	1 / 1	39.3	A / B	Floating Car	6	36.1	A / B	
T165	Tassajara Road-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dub	1.04	E	38.7	1 / 2	37.5	A / A	Floating Car	6	34.8	B / B	
T166	Tassajara Road-SB	Somerset Ln/N Dublin Ranch Dr	Central Parkway	Dub	0.68	E	33.8	1 / 2	26.0	C / C	Floating Car	6	43.1	A / A	
T167	Tassajara Road-SB	Central Parkway	WB I-580 OFF ramp	Dub	0.49	E	25.7	1 / 2	16.5	E / E	Floating Car	6	29.6	B / B	
T168	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	SR 84/Isabel Ave	Murrita Blvd	Liv	0.91	E	31.5	1 / 2	28.6	B / B	Floating Car	6	28.1	B / B	
T169	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	Murrita Blvd	S Livermore Ave	Liv	1.07	E	23.4	2 / 3	23.1	C / C	Floating Car	6	26.3	B / B	
T170	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	S Livermore Ave	Inman St	Liv	0.46	E	21.7	2 / 3	22.2	C / C	Floating Car	6	24.8	B / B	

Appendix B. 2014 Level of Service Results

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T171	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Inman St	S Livermore Ave	Liv	0.46	E	20.1	2 / 3	14.6	D / D	Floating Car	6	15.2	D / D	
T172	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	S Livermore Ave	Murrita Blvd	Liv	1.07	E	26.6	2 / 3	17.4	D / D	Floating Car	6	24.4	B / B	
T173	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	0.91	E	21.9	1 / 2	39.8	A / A	Floating Car	6	15.3	E / E	
T174	Stoneridge Drive-EB	SB I-680 OFF Ramp	Hopyard Rd	Plea	0.93	E	33.2	1 / 2	25.2	C / C	INRIX Data	3380	29.0	B / B	
T175	Stoneridge Drive-EB	Hopyard Rd	Hacienda Dr	Plea	0.49	E	29.8	1 / 2	36.8	A / A	INRIX Data	2374	28.4	B / B	
T176	Stoneridge Drive-EB	Hacienda Dr	W. Las Positas Blvd	Plea	0.63	E	31.1	1 / 2	25.9	C / C	INRIX Data	2180	28.7	B / B	
T177	Stoneridge Drive-EB	W. Las Positas Blvd	Santa Rita Road	Plea	0.44	E	30.0	1 / 2	12.0	F / F	INRIX Data	1668	26.6	C / C	
T178	Santa Rita Road-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Plea	0.29	E	31.1	1 / 2	15.2	E / E	INRIX Data	2944	29.5	B / B	
T179	Santa Rita Road-EB	W. Los Positas Blvd	WB I-580 OFF Ramp	Plea	0.88	E	30.3	1 / 2	32.3	B / B	INRIX Data	3123	26.3	C / C	
T180	Santa Rita Road-WB	WB I-580 OFF Ramp	W. Los Positas Blvd	Plea	0.88	E	31.3	1 / 2	32.6	B / B	INRIX Data	2361	28.5	B / B	
T181	Santa Rita Road-WB	W. Los Positas Blvd	Santa Rita Road	Plea	0.29	E	31.5	1 / 2	35.2	A / A	INRIX Data	2868	30.1	B / B	
T182	Stoneridge Drive-WB	Santa Rita Road	W. Las Positas Blvd	Plea	0.44	E	31.8	1 / 2	19.7	D / D	INRIX Data	547	29.1	B / B	
T183	Stoneridge Drive-WB	W. Las Positas Blvd	Hacienda Dr	Plea	0.63	E	33.8	1 / 2	24.9	C / C	INRIX Data	1473	30.5	B / B	
T184	Stoneridge Drive-WB	Hacienda Dr	Hopyard Rd	Plea	0.49	E	28.8	1 / 2	19.4	D / D	INRIX Data	2218	24.6	C / C	
T185	Stoneridge Drive-WB	Hopyard Rd	SB I-680 OFF Ramp	Plea	0.93	E	32.9	1 / 2	29.2	B / B	INRIX Data	2401	27.5	C / C	[2]
T186	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Plea	1.23	E	31.2	1 / 2	24.8	C / C	INRIX Data	1583	27.5	C / C	
T187	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	0.63	E	26.1	3 / 4	21.6	B / B	INRIX Data	3232	21.0	B / B	
T188	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Plea	0.86	E	32.1	2 / 3	26.1	B / B	INRIX Data	1858	27.2	B / B	
T189	Sunol Blvd.- 1st Street-Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Plea, Ala Cnty	2.98	E	44.9	1 / 1	43.5	A / A	INRIX Data	3738	47.6	A / A	
T190	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Plea, Ala Cnty	2.98	E	51.0	1 / 1	44.6	A / A	INRIX Data	2660	47.8	A / A	
T191	Sunol Blvd.- 1st Street-Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Plea	0.86	E	34.6	2 / 3	24.9	B / B	INRIX Data	552	30.2	A / A	

Table B-8: 2014 LOS Monitoring Results for Arterials (Tier 2) - PM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T192	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Plea	0.63	E	25.4	3 / 4	15.6	C / C	INRIX Data	1910	22.3	B / B	
T193	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave	NB I-680 OFF	Plea	1.23	E	35.6	1 / 2	34.2	B / B	INRIX Data	727	32.8	B / B	

Comments

[1] Data impacted by construction or recurrent lane closures

[2] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results			2014 Results			Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T1	W.Grand Ave - Grand Ave - EB	I-80/Maritime St	San Pablo Ave	Oak	1.63	N	26.6	2 / 3	17.9	D / D	INRIX Data	519	24.3	B / B	[2]
T2	W.Grand Ave - Grand Ave - EB	San Pablo Ave	Broadway	Oak	0.40	N	19.9	3 / 4	20.1	B / C	INRIX Data	2305	15.8	C / C	
T3	W.Grand Ave - Grand Ave - EB	Broadway	I-580	Oak	1.08	N	21.6	3 / 4	25.8	A / B	INRIX Data	672	19.5	B / B	[2]
T4	W.Grand Ave - Grand Ave - WB	I-580	Broadway	Oak	1.08	N	21.5	3 / 4	24.4	B / B	INRIX Data	706	18.9	C / C	
T5	W.Grand Ave - Grand Ave - WB	Broadway	San Pablo Ave	Oak	0.40	N	20.8	3 / 4	14.8	C / D	INRIX Data	1615	17.0	C / C	
T6	W.Grand Ave - Grand Ave - WB	San Pablo Ave	I-80/Maritime St	Oak	1.63	N	28.3	2 / 3	18.0	C / D	INRIX Data	1892	20.0	C / C	[2]
T7	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	I-980 ON Ramp/Brush St	Webster	Oak	0.60	N	14.4	3 / 4	16.3	C / D	Floating Car	6	14.5	C / C	
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	Webster	East side of Lake Merritt Channel	Oak	0.66	N	14.7	3 / 4	23.1	B / C	Floating Car	6	15.0	C / C	
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	1.15	N	16.7	3 / 4	17.5	C / D	Floating Car	6	11.0	D / 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	N	16.8	3 / 4	17.7	C / D	Floating Car	6	16.0	C / C	
T11	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	East side of Lake Merritt Channel	Webster	Oak	0.64	N	15.9	3 / 4	17.6	C / D	Floating Car	8	13.3	C / C	

Appendix B. 2014 Level of Service Results

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T12	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oak	0.60	N	17.4	3 / 4	19.2	B / C	Floating Car	8	11.1	D / D	
T13	Telegraph Ave-NB	51st Street	Russell St	Oak, Berk	1.41	N	15.0	3 / 4	16.4	C / D	Floating Car	6	18.1	C / C	
T14	Telegraph Ave-NB	Russell St	Bancroft Way	Berk	0.77	N	13.5	3 / 4	19.9	B / C	Floating Car	6	19.9	B / B	
T15	Telegraph Ave-SB	Bancroft Way	Russell St	Berk	0.90	N	13.9	3 / 4	15.8	C / D	Floating Car	6	17.4	C / C	[2]
T16	Telegraph Ave-SB	Russell St	51st Street	Oak, Berk	1.41	N	18.5	3 / 4	20.7	B / C	Floating Car	6	19.7	B / B	
T17	Broadway-SB	Broadway/College Ave	Grand Ave	Oak	1.91	N	20.8	2 / 3	16.2	D / E	INRIX Data	143	18.1	C / C	
T18	Broadway-SB	Grand Ave	14th St	Oak	0.55	N	18.2	3 / 4	12.5	D / E	INRIX Data	885	18.3	C / C	
T19	Broadway-SB	14th St	5th St/Broadway	Oak	0.48	N	17.9	3 / 4	11.8	D / E	INRIX Data	1198	16.8	C / C	
T20	Broadway (Connection to I-880)-SB	5th St/Broadway	I-880 ON Ramp	Oak	0.21	N	62.9	1 / 1	14.4	E / F	INRIX Data	3775	49.2	A / A	[2]
T21	Broadway (Connection to I-880)-NB	I-880 OFF Ramp	5th St/Broadway	Oak	1.26	N	23.0	1 / 2	23.0	C / D	Floating Car	6	15.1	E / E	[2]
T22	Broadway-NB	5th St/Broadway	14th St	Oak	0.48	N	17.1	3 / 4	12.5	D / E	INRIX Data	1687	15.1	C / C	
T23	Broadway-NB	14th St	Grand Ave	Oak	0.55	N	18.3	3 / 4	16.0	C / D	INRIX Data	1181	16.0	C / C	
T24	Broadway-NB	Grand Ave	Broadway/College Ave	Oak	1.91	N	21.9	2 / 3	15.7	D / E	INRIX Data	516	17.4	D / D	
T25	Durant-EB	Shattuck	College Ave.	Berk	0.73	N	16.0	3 / 4	14.4	C / D	Floating Car	6	16.3	C / C	
T26	College Avenue-SB	Bancroft Way/College Ave	Ashby Ave	Berk	0.85	N	16.8	3 / 4	13.2	C / E	INRIX Data	501	16.7	C / C	
T27	College Avenue-SB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oak, Berk	0.83	N	19.7	3 / 4	15.7	C / D	INRIX Data	146	18.9	C / C	
T28	College Avenue-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Oak	0.61	N	16.7	3 / 4	16.0	C / D	INRIX Data	408	15.2	C / C	
T29	College Avenue-NB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Oak	0.61	N	17.0	3 / 4	16.1	C / D	INRIX Data	885	16.8	C / C	
T30	College Avenue-NB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oak, Berk	0.83	N	18.3	3 / 4	12.5	D / E	INRIX Data	477	16.5	C / C	
T31	College Avenue-NB	Ashby Ave	Bancroft Way/College Ave	Berk	0.85	N	16.8	3 / 4	15.9	C / D	INRIX Data	780	16.4	C / C	
T32	Bancroft-WB	College Ave.	Shattuck	Berk	0.73	N	12.5	3 / 4	14.8	C / D	Floating Car	6	14.1	C / C	

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T33	51st Street-EB	SR 24 Off Ramp/52nd St	Broadway	Oak	0.75	N	15.0	3 / 4	15.4	C / D	Floating Car	9	17.2	C / C	
T34	51st Street-WB	Broadway	SR 24 Off Ramp/52nd St	Oak	0.75	N	15.7	3 / 4	16.9	C / D	Floating Car	8	17.9	C / C	
T35	Shattuck Avenue-NB	51st	Alcatraz Ave.	Oak, Berk	0.81	N	22.8	3 / 4	22.4	B / C	Floating Car	7	20.9	B / B	
T36	Shattuck Avenue-NB	Alcatraz Ave.	Adeline St.	Berk	0.70	N	16.7	3 / 4	18.4	C / C	Floating Car	7	16.7	C / C	
T37	Shattuck Avenue-SB	Adeline St.	Alcatraz Ave.	Berk	0.70	N	17.1	3 / 4	18.8	C / C	Floating Car	6	17.1	C / C	
T38	Shattuck Avenue-SB	Alcatraz Ave.	51st	Oak	0.81	N	17.3	3 / 4	14.5	C / D	Floating Car	6	18.1	C / C	
T39	Powel Street-Stanford Avenue-EB	NB I-80 OFF Ramp	San Pablo Ave	Emery	0.75	N	15.5	2 / 3	14.4	D / E	Floating Car	7	18.5	C / C	
T40	Powel Street-Stanford Avenue-EB	San Pablo Ave	MLK Jr Way	Oak, Berk	0.76	N	17.0	2 / 3	17.8	D / D	Floating Car	7	17.4	D / D	
T41	Powel Street-Stanford Avenue-WB	MLK Jr Way	San Pablo Ave	Oak, Berk	0.76	N	19.1	2 / 3	16.7	D / E	Floating Car	6	23.0	C / C	
T42	Powel Street-Stanford Avenue-WB	San Pablo Ave	NB I-80 OFF Ramp	Emery, Oak	0.75	N	15.3	2 / 3	21.2	C / D	Floating Car	6	15.0	D / D	
T43	40thStreet-Shellmound Avenue-EB	Shellmound Way (north of Powell St)	40th St	Emery	0.73	N	24.6	2 / 3	26.8	B / C	Floating Car	7	24.6	B / B	
T44	40thStreet-Shellmound Avenue-EB	40th St	San Pablo Ave	Emery	0.68	N	16.5	3 / 4	16.9	C / D	Floating Car	7	25.7	A / A	
T45	40thStreet-Shellmound Avenue-WB	San Pablo Ave	40th St	Emery	0.68	N	22.0	3 / 4	25.2	A / B	Floating Car	7	20.6	B / B	
T46	40thStreet-Shellmound Avenue-WB	40th St	Shellmound Way (north of Powell St)	Emery	0.73	N	29.0	2 / 3	28.3	B / B	Floating Car	7	29.0	B / B	
T47	International Boulevard-NB	42nd Ave	Fruitvale Ave	Oak	0.62	N	21.9	3 / 4	21.7	B / C	INRIX Data	2602	16.7	C / C	
T48	International Boulevard-NB	Fruitvale Ave	14th Ave	Oak	1.38	N	22.9	3 / 4	26.6	A / B	INRIX Data	2309	22.3	B / B	
T49	International Boulevard-NB	14th Ave	Lake Merritt Blvd	Oak	0.88	N	22.5	3 / 4	21.2	B / C	INRIX Data	2168	20.3	B / B	
T50	International Boulevard-SB	Lake Merritt Blvd	14th Ave	Oak	0.88	N	21.5	3 / 4	20.8	B / C	INRIX Data	441	20.4	B / B	
T51	International Boulevard-SB	14th Ave	Fruitvale Ave	Oak	1.38	N	22.9	3 / 4	24.4	B / B	INRIX Data	815	21.9	B / B	
T52	International Boulevard-SB	Fruitvale Ave	42nd Ave	Oak	0.62	N	21.4	3 / 4	18.9	C / C	INRIX Data	1170	18.7	C / C	
T53	73rd Ave--NB	International Blvd/73rd Ave	73rd Ave/Foothill Blvd	Oak	1.07	N	28.1	2 / 3	18.4	C / D	INRIX Data	2518	23.1	C / C	

Appendix B. 2014 Level of Service Results

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T54	Foothill Boulevard-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oak	1.02	N	20.3	3 / 4	18.5	C / C	INRIX Data	261	20.2	B / B	
T55	Foothill Boulevard-NB	Seminary Ave	High Street	Oak	1.22	N	21.5	3 / 4	20.0	B / C	INRIX Data	658	21.0	B / B	
T56	Foothill Boulevard-NB	High Street	Fruitvale Ave	Oak	0.90	N	19.8	3 / 4	12.1	D / E	INRIX Data	519	16.3	C / C	
T57	Foothill Boulevard-NB	Fruitvale Ave	14th Ave	Oak	1.32	N	22.9	2 / 3	20.9	C / D	INRIX Data	113	21.9	C / C	
T58	Foothill Boulevard-NB	14th Ave	1st Ave/Lake Shore Blvd	Oak	0.88	N	20.5	3 / 4	16.2	C / D	INRIX Data	267	19.4	B / B	
T60	Foothill Boulevard-SB	14th Ave	Fruitvale Ave	Oak	1.32	N	21.8	2 / 3	18.6	C / D	INRIX Data	120	21.9	C / C	
T61	Foothill Boulevard-SB	Fruitvale Ave	High Street	Oak	0.90	N	20.8	3 / 4	15.8	C / D	INRIX Data	119	19.6	B / B	
T62	Foothill Boulevard-SB	High Street	Seminary Ave	Oak	1.22	N	20.2	3 / 4	21.0	B / C	INRIX Data	292	19.8	B / B	
T63	Foothill Boulevard-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	1.02	N	21.2	3 / 4	21.0	B / C	INRIX Data	169	21.2	B / B	
T64	73rd Ave--SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oak	1.07	N	26.9	2 / 3	21.3	C / D	INRIX Data	783	24.3	B / B	
T65	E. 15th Street-SB	1st Avenue	14th Avenue	Oak	0.98	N	14.8	3 / 4	19.1	B / C	Floating Car	6	13.8	C / C	
T66	High Street-EB	Otis Drive	Central Ave	Ala	0.58	N	19.7	3 / 4	18.2	C / C	Floating Car	6	15.9	C / C	
T67	High Street-EB	Central Ave	Fernside Blvd	Ala	0.48	N	19.3	3 / 4	13.2	C / E	Floating Car	6	11.5	D / D	
T68	High Street-EB	Fernside Blvd	NB I-880 OFF Ramp	Ala, Oak	0.50	N	14.8	2 / 3	12.5	E / F	Floating Car	6	14.0	D / D	
T69	High Street-EB	NB I-880 OFF Ramp	Foothill Blvd	Oak	0.61	N	16.3	3 / 4	11.5	D / E	Floating Car	6	15.2	C / C	
T70	High Street-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oak	1.29	N	20.9	3 / 4	18.9	C / C	Floating Car	6	16.2	C / C	
T71	High Street-WB	MacArthur Blvd/WB I-580 OFF Ramp	Foothill Blvd	Oak	1.29	N	21.2	3 / 4	28.1	A / B	Floating Car	6	15.6	C / C	[2]
T72	High Street-WB	Foothill Blvd	NB I-880 OFF Ramp	Oak	0.61	N	16.9	3 / 4	9.1	D / F	Floating Car	6	12.1	D / D	
T73	High Street-WB	NB I-880 OFF Ramp	Fernside Blvd	Ala, Oak	0.50	N	21.6	2 / 3	18.3	C / D	Floating Car	6	18.9	C / C	
T74	High Street-WB	Fernside Blvd	Central Ave	Ala	0.48	N	16.8	3 / 4	19.9	B / C	Floating Car	6	17.9	C / C	
T75	High Street-WB	Central Ave	Otis Drive	Ala	0.58	N	24.5	3 / 4	14.1	C / D	Floating Car	6	19.9	B / B	
T76	Crow Canyon Road/Grove Way-NB	A Street/Redwood Road	EB I-580 ON Ramp/Grove Way	Ala Cnty	0.95	C	29.0	2 / 3	31.6	A / B	INRIX Data	1094	23.2	C / C	
T77	Crow Canyon Road/Grove Way-NB	EB I-580 ON Ramp/Grove Way	Cull Canyon	Ala Cnty	0.81	C	32.1	1 / 2	20.3	D / E	INRIX Data	1544	24.3	C / C	
T78	Crow Canyon Road-NB	Cull Canyon	Cold Water Dr	Ala Cnty	0.88	C	42.3	1 / 2	34.1	B / B	INRIX Data	1485	39.7	A / A	

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T79	Crow Canyon Road-NB	Cold Water Dr	0.43 miles north of Norris Canyon Rd	Ala Cnty	2.41	C	42.0	Rural	41.9	A / -	INRIX Data	2957	39.3	A / -	[2]
T80	Crow Canyon Road-NB	0.43 miles north of Norris Canyon Rd	County Line	Ala Cnty	2.97	C	42.0	Rural	43.9	A / -	INRIX Data	3613	39.5	A / -	[2]
T81	Crow Canyon Road-SB	County Line	0.43 miles north of Norris Canyon Rd	Ala Cnty	2.97	C	41.4	Rural	45.8	A / -	INRIX Data	3686	40.3	A / -	[2]
T82	Crow Canyon Road-SB	0.43 miles north of Norris Canyon Rd	Cold Water Dr	Ala Cnty	2.40	C	41.4	Rural	44.8	A / -	INRIX Data	3602	40.2	A / -	[2]
T83	Crow Canyon Road-SB	Cold Water Dr	Cull Canyon	Ala Cnty	0.89	C	41.6	1 / 2	29.3	B / C	INRIX Data	2064	39.5	A / A	
T84	Crow Canyon Road/Grove Way-SB	Cull Canyon	EB I-580 ON Ramp/Grove Way	Ala Cnty	0.82	C	36.1	1 / 2	22.8	C / D	INRIX Data	979	30.8	B / B	
T85	Crow Canyon Road/Grove Way-SB	EB I-580 ON Ramp/Grove Way	A Street/Redwood Road	Ala Cnty	0.94	C	30.7	2 / 3	21.6	C / D	INRIX Data	855	27.2	B / B	
T86	Winton Avenue - D Street-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hay	0.39	C	25.7	2 / 3	25.8	B / C	INRIX Data	3475	22.2	C / C	
T87	Winton Avenue - D Street-EB	SB I-880 ON Ramp	Santa Clara St	Hay	0.35	C	33.5	2 / 3	18.7	C / D	INRIX Data	2523	28.5	B / B	
T88	Winton Avenue - D Street-EB	Santa Clara St	Soto Rd	Hay	0.55	C	24.1	2 / 3	19.4	C / D	INRIX Data	3026	19.7	C / C	
T89	Winton Avenue - D Street-EB	Soto Rd	Foothill Boulevard/D St	Hay	0.92	C	24.5	2 / 3	10.7	E / F	INRIX Data	1410	18.2	C / C	
T90	Winton Avenue - D Street-WB	Foothill Boulevard/D St	Soto Rd	Hay	0.92	C	27.2	2 / 3	16.0	D / D	INRIX Data	1322	19.5	C / C	
T91	Winton Avenue - D Street-WB	Soto Rd	Santa Clara St	Hay	0.55	C	23.0	2 / 3	22.9	C / C	INRIX Data	3445	17.6	D / D	
T92	Winton Avenue - D Street-WB	Santa Clara St	SB I-880 ON Ramp	Hay	0.35	C	34.7	2 / 3	18.7	C / C	INRIX Data	2988	32.9	A / A	
T93	Winton Avenue - D Street-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hay	0.39	C	24.1	2 / 3	25.5	B / B	INRIX Data	3697	14.9	D / D	
T94	A Street-EB	Foothill Boulevard/A St	Redwood Rd/Grove Way	Hay, Ala Cnty	0.80	C	23.6	2 / 3	17.3	D / D	Floating Car	6	13.5	E / E	
T95	A Street-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Ala Cnty	0.42	C	18.5	2 / 3	24.4	B / B	Floating Car	6	14.6	D / D	
T96	A Street-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Ala Cnty	0.42	C	28.8	2 / 3	19.1	C / C	Floating Car	6	22.0	C / C	
T97	A Street-WB	Redwood Rd/Grove Way	Foothill Boulevard/A St	Ala Cnty	0.80	C	15.8	2 / 3	8.9	F / F	Floating Car	6	16.9	D / D	
T98	Hesperian Boulevard-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Uni Cty	0.98	S	26.5	1 / 2	23.1	C / C	Floating Car	6	22.3	C / C	
T99	Hesperian Boulevard-Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	0.30	S	32.9	1 / 2	34.2	B / B	Floating Car	6	25.0	C / C	

Appendix B. 2014 Level of Service Results

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T100	Hesperian Boulevard-Union City Blvd-NB	Hesperian/Union City Blvd/overbridge	Industrial Blvd	Hay	0.57	S	26.4	1 / 2	22.6	C / C	Floating Car	6	27.8	C / C	
T101	Hesperian Boulevard-Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Hay	1.05	S	25.2	2 / 3	22.8	C / C	Floating Car	6	31.3	A / A	
T102	Hesperian Boulevard-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Hay	1.05	S	26.8	2 / 3	24.4	B / B	Floating Car	8	17.7	D / D	
T103	Hesperian Boulevard-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Hay	0.57	S	19.3	1 / 2	23.9	C / C	Floating Car	8	18.9	D / D	
T104	Hesperian Boulevard-Union City Blvd-SB	Hesperian/Union City Blvd/overbridge	Whipple Rd	Uni Cty	0.30	S	22.1	1 / 2	26.9	C / C	Floating Car	8	21.8	D / D	
T105	Hesperian Boulevard-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Uni Cty	0.98	S	29.5	1 / 2	23.6	C / C	Floating Car	8	22.4	C / C	
T106	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Fre	0.22	S	30.6	1 / 2	26.5	C / C	INRIX Data	1740	27.7	C / C	
T107	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Uni Cty, Fre	1.42	S	32.4	1 / 2	20.2	D / D	INRIX Data	998	29.5	B / B	
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Uni Cty	0.51	S	28.5	1 / 2	16.2	E / E	INRIX Data	306	26.6	C / C	
T109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Uni Cty	0.51	S	28.1	1 / 2	19.1	D / D	INRIX Data	1826	25.7	C / C	
T110	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Uni Cty, Fre	1.42	S	31.2	1 / 2	21.3	D / D	INRIX Data	1766	28.2	B / B	
T111	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Fre	0.22	S	31.6	1 / 2	29.8	B / B	INRIX Data	2639	26.0	C / C	
T112	Fremont Boulevard-NB	NB I-880 OFF Ramp	Automall Parkway	Fre	1.28	S	34.7	1 / 2	25.2	C / C	INRIX Data	789	30.6	B / B	
T113	Fremont Boulevard-NB	Automall Parkway	Blacow Rd	Fre	0.91	S	34.2	1 / 2	25.6	C / C	INRIX Data	1431	31.2	B / B	
T114	Fremont Boulevard-NB	Blacow Rd	Adams Ave	Fre	0.38	S	28.0	1 / 2	31.2	B / B	INRIX Data	3532	25.1	C / C	
T115	Fremont Boulevard-NB	Adams Ave	Stevenson Rd	Fre	1.17	S	27.9	2 / 3	22.5	C / C	INRIX Data	2848	24.5	B / B	
T116	Fremont Boulevard-NB	Stevenson Rd	Mowry Ave	Fre	1.00	S	30.2	2 / 3	22.5	C / C	INRIX Data	1997	27.4	B / B	
T117	Fremont Boulevard-NB	Mowry Ave	Peralta Blvd	Fre	1.21	S	30.0	2 / 3	22.0	C / C	INRIX Data	1939	25.7	B / B	[1]
T118	Fremont Boulevard-NB	Peralta Blvd	Thornton Ave	Fre	0.33	S	30.9	2 / 3	15.6	D / D	INRIX Data	1608	26.6	B / B	
T119	Fremont Boulevard-NB	Thornton Ave	Decoto Rd	Fre	1.33	S	32.0	1 / 2	20.2	D / D	INRIX Data	1508	28.0	C / C	
T120	Fremont Boulevard-NB	Decoto Rd	Paseo Padre Pkwy	Fre	0.56	S	31.0	1 / 2	30.1	B / B	INRIX Data	1767	30.0	B / B	

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T121	Fremont Boulevard-NB	Paseo Padre Pkwy	NB I-880 OFF Ramp	Fre	0.39	S	31.0	1 / 2	33.2	B / B	INRIX Data	1722	30.2	B / B	[2]
T122	Fremont Boulevard-SB	NB I-880 OFF Ramp	Paseo Padre Pkwy	Fre	0.39	S	32.0	1 / 2	23.6	C / C	INRIX Data	1143	29.5	B / B	
T123	Fremont Boulevard-SB	Paseo Padre Pkwy	Decoto Rd	Fre	0.56	S	29.7	1 / 2	17.3	D / D	INRIX Data	1400	23.7	C / C	
T124	Fremont Boulevard-SB	Decoto Rd	Thornton Ave	Fre	1.33	S	30.2	1 / 2	21.7	D / D	INRIX Data	1499	25.5	C / C	
T125	Fremont Boulevard-SB	Thornton Ave	Peralta Blvd	Fre	0.32	S	29.3	2 / 3	20.9	C / C	INRIX Data	1624	22.0	C / C	
T126	Fremont Boulevard-SB	Peralta Blvd	Mowry Ave	Fre	1.21	S	29.4	2 / 3	20.5	C / C	INRIX Data	1030	24.9	B / B	[1]
T127	Fremont Boulevard-SB	Mowry Ave	Stevenson Rd	Fre	1.00	S	32.3	2 / 3	34.9	A / A	INRIX Data	872	31.7	A / A	
T128	Fremont Boulevard-SB	Stevenson Rd	Adams Ave	Fre	1.17	S	27.8	2 / 3	29.1	B / B	INRIX Data	2047	23.9	C / C	[2]
T129	Fremont Boulevard-SB	Adams Ave	Blacow Rd	Fre	0.38	S	27.9	1 / 2	20.1	D / D	INRIX Data	3497	24.2	C / C	
T130	Fremont Boulevard-SB	Blacow Rd	Automall Parkway	Fre	0.91	S	33.1	1 / 2	18.8	D / D	INRIX Data	900	28.0	C / C	
T131	Fremont Boulevard-SB	Automall Parkway	NB I-880 OFF Ramp	Fre	1.28	S	34.9	1 / 2	26.9	C / C	INRIX Data	1146	29.3	B / B	
T132	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fre	0.85	S	23.1	1 / 2	26.8	C / C	Floating Car	6	23.1	C / C	
T133	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fre	0.74	S	29.5	1 / 2	28.2	B / B	Floating Car	6	29.5	B / B	
T134	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fre	0.75	S	21.1	1 / 2	27.4	C / C	Floating Car	7	15.1	E / E	
T135	Automall Parkway-WB	Fremont Blvd	NB I-880 OFF Ramp	Fre	0.85	S	27.1	1 / 2	28.1	B / B	Floating Car	7	27.1	C / C	
T136	Vasco Road-NB	WB I-580 OFF Ramp	Scenic Ave	Liv	0.44	E	36.3	1 / 2	23.6	C / C	INRIX Data	2818	28.5	B / B	
T137	Vasco Road-NB	Scenic Ave	Dalton Ave/City-County Line	Liv	0.68	E	37.4	1 / 2	35.5	A / A	INRIX Data	3139	31.0	B / B	
T138	Vasco Road-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Liv	3.11	E	53.0	Rural	43.7	B / -	INRIX Data	3146	51.5	A / -	
T139	Vasco Road-NB	N. Vasco Rd/Vasco Rd	Local Road underpass/County Line	Liv	2.25	E	53.0	Rural	53.3	A / -	INRIX Data	3146	51.5	A / -	[2]
T140	Vasco Road-SB	Local Road underpass/County Line	N. Vasco Rd/Vasco Rd	Liv	2.25	E	46.8	Rural	24.3	E / -	INRIX Data	3894	38.7	B / -	
T141	Vasco Road-SB	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Liv	3.11	E	46.8	Rural	23.9	E / -	INRIX Data	3894	38.7	B / -	
T142	Vasco Road-SB	Dalton Ave/City-County Line	Scenic Ave	Liv	0.68	E	34.3	1 / 2	22.0	D / D	INRIX Data	3697	28.6	B / B	
T143	Vasco Road-SB	Scenic Ave	WB I-580 OFF Ramp	Liv	0.44	E	32.0	1 / 2	16.6	E / E	INRIX Data	3371	27.1	C / C	

Appendix B. 2014 Level of Service Results

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T144	Dublin Blvd.-EB	San Ramon Road	Village Parkway	Dub	0.73	E	26.5	2 / 3	20.8	C / C	INRIX Data	623	22.9	C / C	
T145	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dub	0.81	E	29.5	2 / 3	23.4	C / C	INRIX Data	1681	26.9	B / B	
T146	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dub	1.21	E	34.1	1 / 2	31.4	B / B	INRIX Data	1264	29.3	B / B	
T147	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dub	0.89	E	30.2	1 / 2	22.9	C / C	INRIX Data	660	28.3	B / B	
T148	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dub	0.89	E	29.1	1 / 2	29.8	B / B	INRIX Data	479	28.3	B / B	
T149	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dub	1.21	E	32.8	1 / 2	23.1	C / C	INRIX Data	1281	28.2	B / B	
T150	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dub	0.81	E	29.5	2 / 3	23.9	C / C	INRIX Data	3593	26.3	B / B	
T151	Dublin Blvd.-WB	Village Parkway	San Ramon Road	Dub	0.73	E	24.5	2 / 3	22.2	C / C	INRIX Data	858	24.7	B / B	
T152	San Ramon Road-NB	WB I-580 OFF ramp	Silvergate Dr	Dub	0.64	E	30.8	1 / 2	18.0	D / D	INRIX Data	996	26.7	C / C	
T153	San Ramon Road-NB	Silvergate Dr	Alcosta Blvd/Westside Dr/County Line	Dub	0.99	E	35.1	1 / 2	28.8	B / B	INRIX Data	1663	31.3	B / B	
T154	San Ramon Road-SB	Alcosta Blvd/Westside Dr/County Line	Silvergate Dr	Dub	0.99	E	35.8	1 / 2	33.9	B / B	INRIX Data	1542	35.0	A / A	
T155	San Ramon Road-SB	Silvergate Dr	WB I-580 OFF ramp	Dub	0.64	E	32.7	1 / 2	21.4	D / D	INRIX Data	478	28.3	B / B	
T156	Dougherty Road-NB	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dub	1.12	E	35.4	1 / 2	38.5	A / A	INRIX Data	3485	29.8	B / B	[1]
T157	Dougherty Road-NB	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dub	0.80	E	44.1	1 / 2	44.0	A / A	INRIX Data	3430	42.4	A / A	
T158	Dougherty Road-SB	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dub	0.80	E	43.1	1 / 2	28.9	B / B	INRIX Data	2366	35.4	A / A	
T159	Dougherty Road-SB	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dub	1.12	E	33.1	1 / 2	21.3	D / D	INRIX Data	2291	25.5	C / C	[1]
T160	Tassajara Road-NB	WB I-580 OFF ramp	Central Parkway	Dub	0.49	E	24.7	1 / 2	23.6	C / C	Floating Car	6	21.6	D / D	
T161	Tassajara Road-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dub	0.68	E	34.3	1 / 2	23.3	C / C	Floating Car	6	18.5	D / D	
T162	Tassajara Road-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dub	1.04	E	38.4	1 / 2	35.1	A / A	Floating Car	6	35.2	A / A	
T163	Tassajara Road-NB	Fallon Rd	County Line	Ala Cnty	0.51	E	35.2	1 / 1	39.8	A / B	Floating Car	6	35.9	A / B	
T164	Tassajara Road-SB	County Line	Fallon Rd	Ala Cnty	0.51	E	45.2	1 / 1	40.5	A / B	Floating Car	6	29.2	B / C	
T165	Tassajara Road-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dub	1.04	E	38.7	1 / 2	35.4	A / A	Floating Car	6	32.4	B / B	

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T166	Tassajara Road-SB	Somerset Ln/N Dublin Ranch Dr	Central Parkway	Dub	0.68	E	33.8	1 / 2	22.4	C / C	Floating Car	6	34.3	B / B	
T167	Tassajara Road-SB	Central Parkway	WB I-580 OFF ramp	Dub	0.49	E	25.7	1 / 2	16.7	E / E	Floating Car	6	25.7	C / C	
T168	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	SR 84/Isabel Ave	Murrita Blvd	Liv	0.91	E	31.5	1 / 2	20.4	D / D	Floating Car	6	31.5	B / B	
T169	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	Murrita Blvd	S Livermore Ave	Liv	1.07	E	23.4	2 / 3	21.9	C / C	Floating Car	6	24.3	B / B	
T170	E. Stanley Blvd - Railroad Avenue - 1st Street-NB	S Livermore Ave	Inman St	Liv	0.46	E	21.7	2 / 3	14.2	D / D	Floating Car	6	22.8	C / C	
T171	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Inman St	S Livermore Ave	Liv	0.46	E	20.1	2 / 3	20.1	C / C	Floating Car	6	21.7	C / C	
T172	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	S Livermore Ave	Murrita Blvd	Liv	1.07	E	26.6	2 / 3	20.1	C / C	Floating Car	6	26.6	B / B	
T173	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	0.91	E	21.9	1 / 2	38.6	A / A	Floating Car	6	18.0	D / D	
T174	Stoneridge Drive-EB	SB I-680 OFF Ramp	Hopyard Rd	Plea	0.93	E	33.2	1 / 2	19.7	D / D	INRIX Data	2027	29.6	B / B	
T175	Stoneridge Drive-EB	Hopyard Rd	Hacienda Dr	Plea	0.49	E	29.8	1 / 2	22.4	C / C	INRIX Data	2018	25.7	C / C	
T176	Stoneridge Drive-EB	Hacienda Dr	W. Las Positas Blvd	Plea	0.63	E	31.1	1 / 2	25.3	C / C	INRIX Data	1729	29.7	B / B	
T177	Stoneridge Drive-EB	W. Las Positas Blvd	Santa Rita Road	Plea	0.44	E	30.0	1 / 2	14.6	E / E	INRIX Data	1203	30.6	B / B	
T178	Santa Rita Road-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Plea	0.29	E	31.1	1 / 2	15.6	E / E	INRIX Data	3221	31.9	B / B	
T179	Santa Rita Road-EB	W. Los Positas Blvd	WB I-580 OFF Ramp	Plea	0.88	E	30.3	1 / 2	34.5	B / B	INRIX Data	3263	31.4	B / B	
T180	Santa Rita Road-WB	WB I-580 OFF Ramp	W. Los Positas Blvd	Plea	0.88	E	31.3	1 / 2	25.5	C / C	INRIX Data	2822	30.3	B / B	
T181	Santa Rita Road-WB	W. Los Positas Blvd	Santa Rita Road	Plea	0.29	E	31.5	1 / 2	27.6	C / C	INRIX Data	3196	29.7	B / B	
T182	Stoneridge Drive-WB	Santa Rita Road	W. Las Positas Blvd	Plea	0.44	E	31.8	1 / 2	25.5	C / C	INRIX Data	1027	28.9	B / B	
T183	Stoneridge Drive-WB	W. Las Positas Blvd	Hacienda Dr	Plea	0.63	E	33.8	1 / 2	28.5	B / B	INRIX Data	2408	31.4	B / B	
T184	Stoneridge Drive-WB	Hacienda Dr	Hopyard Rd	Plea	0.49	E	28.8	1 / 2	20.1	D / D	INRIX Data	2202	23.6	C / C	
T185	Stoneridge Drive-WB	Hopyard Rd	SB I-680 OFF Ramp	Plea	0.93	E	32.9	1 / 2	21.9	D / D	INRIX Data	2129	28.1	B / B	[2]
T186	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Plea	1.23	E	31.2	1 / 2	28.8	B / B	INRIX Data	1222	30.4	B / B	
T187	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	0.63	E	26.1	3 / 4	19.5	B / B	INRIX Data	1473	23.6	B / B	

Table B-9: 2014 LOS Monitoring Results for Arterials (Tier 2) - AM Peak Period (INRIX or Floating Car Surveys)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	FFS	Class 1985/2000	2012 Results		2014 Results				Note
		From	To						Speed	LOS 85/00	Method	Sample	Speed	LOS 85/00	
T188	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Plea	0.86	E	32.1	2 / 3	26.1	B / B	INRIX Data	231	26.4	B / B	
T189	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Plea, Ala Cnty	2.98	E	44.9	1 / 1	46.7	A / A	INRIX Data	1934	42.2	A / A	
T190	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Plea, Ala Cnty	2.98	E	51.0	1 / 1	38.3	A / B	INRIX Data	3810	47.9	A / A	
T191	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Plea	0.86	E	34.6	2 / 3	31.1	A / A	INRIX Data	2233	27.9	B / B	
T192	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Plea	0.63	E	25.4	3 / 4	11.8	D / D	INRIX Data	3361	18.1	C / C	
T193	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave	NB I-680 OFF	Plea	1.23	E	35.6	1 / 2	26.2	C / C	INRIX Data	2491	27.4	C / C	

Comments

[1] Data impacted by construction or recurrent lane closures

[2] CMP segment length changed based on the shapefiles used to the extent that the speed trends are not directly comparable with previous years

B.5 | HOV and Express Lanes

Table B-10: 2014 LOS Monitoring Results for HOV/Express Lanes - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Type	Segment Limits		Jurisdiction	Plan Area	Length (mi)	# Lanes	2014 LOS Results			Note
			From	To					# Runs	Speed	LOS	
H1	I-80 - EB	HOV	Begin of HOV	I-80/I-580 (Merge)	Oak	N	0.72	1	4	21.1	F	
H2	I-80 - EB	HOV	I-80/I-580 (Merge)	Powell	Emery, Berk	N	0.54	1	4	10.2	F	
H3	I-80 - EB	HOV	Powell	Ashby	Emery, Berk	N	0.72	1	4	27.7	F	
H4	I-80 - EB	HOV	Ashby	University	Emery, Berk	N	1.30	1	4	32.2	E	
H5	I-80 - EB	HOV	University	Jct I-580 (off)	Berk, Alb	N	1.37	1	4	46.2	D	
H6	I-80 - EB	HOV	Jct I-580 (off)	Central (County Line)	Berk, Alb	N	0.84	1	4	50.3	C	
H7	I-80 - WB	HOV	Central (County Line)	Jct I-580	Berk, Alb	N	0.70	1	6	54.9	C	
H8	I-80 - WB	HOV	Jct I-580	University	Berk, Alb	N	1.51	1	6	49.1	C	
H9	I-80 - WB	HOV	University	Ashby	Emery, Berk	N	1.31	1	6	42.8	D	
H10	I-80 - WB	HOV	Ashby	Powell	Emery, Berk	N	0.71	1	6	39.1	E	
H11	I-80 - WB	HOV	Powell	I-80/I-580 (Split)	Emery, Berk	N	0.47	1	6	48.0	D	
H12	I-80 - WB	HOV	I-580 Split	Toll Plaza	Oak	N	1.31	1	6	50.4	C	
H13	I-80 - WB	HOV	Toll Plaza	End of HOV	Oak	N	0.21	1	6	44.8	D	
H14	SR 84 - WB	HOV	I-880 NB (off)	Ardenwood/Newark	New	S	1.01	1	6	56.9	B	
H15	SR 84 - WB	HOV	Ardenwood/Newark	Paseo Padre Pkwy	New	S	1.15	1	6	62.2	A	
H16	SR 84 - WB	HOV	Paseo Padre Pkwy	Toll Gate	Fre	S	0.54	1	6	56.5	B	
H17	SR 92 - WB	HOV	Begin of HOV (Hesperian Blvd)	Clawiter	Hay	C	1.17	1	6	69.8	A	
H18	SR 92 - WB	HOV	Clawiter	Toll Plaza	Uninc, Hay	C	1.88	1	6	69.6	A	
H19	I-580 - EB	HOV	Hopyard	Santa Rita	Plea	E	1.90	1	6	34.4	E	[1]
H20	I-580 - EB	HOV	Santa Rita	El Charro	Uninc, Plea	E	1.25	1	6	40.6	E	[1]
H21	I-580 - EB	HOV	El Charro	SR 84/Airway Blvd.	Uninc	E	1.72	1	6	50.6	C	[1]
H22	I-580 - EB	HOV	SR 84/Airway Blvd.	Portola	Uninc	E	1.73	1	6	48.8	D	[1]
H23	I-580 - EB	HOV	Portola	1st St	Liv	E	2.56	1	6	44.9	D	[1]
H24	I-580 - EB	HOV	1st St	Greenville	Liv, Uninc	E	2.13	1	6	15.5	F	[1]
E1	I-680 - SB	Express Ln	Begin of HOV (Rt 84)	Washington Blvd Entry Point	Uninc, Fre	S	5.74	1	6	66.4	A	
E2	I-680 - SB	Express Ln	Washington Blvd Entry Point	Auto Mall Pkwy Exit Point	Fre	S	1.32	1	6	68.6	A	
E3	I-680 - SB	Express Ln	Auto Mall Pkwy Exit Point	Mission Blvd Entry Point	Fre	S	1.07	1	6	68.5	A	

Appendix B. 2014 Level of Service Results

Table B-10: 2014 LOS Monitoring Results for HOV/Express Lanes - PM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Type	Segment Limits		Jurisdiction	Plan Area	Length (mi)	# Lanes	2014 LOS Results			Note
			From	To					# Runs	Speed	LOS	
E4	I-680 - SB	Express Ln	Mission Blvd Entry Point	Ala border (S of Scott Creek Rd)	Fre	S	3.03	1	6	68.5	A	
H25	I-880 - NB	HOV	Begin HOV	I-880/I-80 Split (16th Street)	Oak	N	0.17	1	6	61.7	A	
H26	I-880 - NB	HOV	I-880/I-80 Split (16th Street)	Toll Plaza	Oak	N	1.40	1	6	58.0	B	
H27	I-880 - NB	HOV	Begin HOV (W Grand Ave)	I-880/I-80 Merge	Oak, Emery	N	1.10	1	6	43.8	D	
H28	I-880 - NB	HOV	SCL County Line	SR 262/Mission	Fre	S	2.01	1	6	24.3	F	
H29	I-880 - NB	HOV	SR262/Mission	AutoMall Pkwy	Fre	S	2.43	1	6	36.4	E	[1]
H30	I-880 - NB	HOV	AutoMall Pkwy	Stevenson Blvd	Fre	S	1.53	1	6	50.7	C	
H31	I-880 - NB	HOV	Stevenson Blvd	Decoto	Fre	S	4.06	1	6	42.5	D	
H32	I-880 - NB	HOV	Decoto	Alvarado Blvd	Fre	S	1.17	1	6	32.3	E	
H33	I-880 - NB	HOV	Alvarado Blvd	Alvarado-Niles Blvd	Fre, Uni Cty	S	1.57	1	6	30.4	E	
H34	I-880 - NB	HOV	Alvarado-Niles Blvd	Tennyson	Uni Cty, Hay	S	2.60	1	6	27.2	F	
H35	I-880 - NB	HOV	Tennyson	SR 92	Hay	C	1.02	1	6	38.9	E	
H36	I-880 - NB	HOV	SR 92	A St	Hay	C	1.68	1	6	41.6	D	
H37	I-880 - NB	HOV	A St	End of HOV	Uninc	C	0.77	1	6	53.0	C	
H38	I-880 - SB	HOV	Begin HOV (South of Marina Blvd)	SR 238 WB (Merge)	San L	N	2.18	1	6	63.8	A	[1]
H39	I-880 - SB	HOV	SR 238 WB (Merge)	A St	San L, Uninc	C	1.91	1	6	68.2	A	
H40	I-880 - SB	HOV	A St	Rt 92/Jackson	Hay	C	1.70	1	6	66.4	A	
H41	I-880 - SB	HOV	Rt 92/Jackson	Tennyson	Hay	C	1.01	1	6	63.8	A	
H42	I-880 - SB	HOV	Tennyson	Alvarado-Niles	Hay, Uni Cty	C	2.60	1	6	57.3	B	
H43	I-880 - SB	HOV	Alvarado-Niles	Alvarado	Uni Cty, Fre	C	1.56	1	6	67.7	A	
H44	I-880 - SB	HOV	Alvarado	Decoto	Fre	C	1.19	1	6	66.2	A	
H45	I-880 - SB	HOV	Decoto	Stevenson	Fre	S	4.06	1	6	65.7	A	
H46	I-880 - SB	HOV	Stevenson	AutoMall Pkwy	Fre	C	1.52	1	6	68.6	A	
H47	I-880 - SB	HOV	AutoMall Pkwy	Rt 262/Mission	Fre	C	2.83	1	6	68.8	A	[1]
H48	I-880 - SB	HOV	SR 262/Mission	SCL County Line	Fre	S	1.61	1	6	70.2	A	

Comments

[1] Data impacted by long term construction or recurrent lane closures

Table B-11: 2014 LOS Monitoring Results for HOV/Express Lanes - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Type	Segment Limits		Jurisdiction	Plan Area	Length (mi)	# Lanes	2014 LOS Results			Note
			From	To					# Runs	Speed	LOS	
H1	I-80 - EB	HOV	Begin of HOV	I-80/I-580 (Merge)	Oak	N	0.72	1	6	55.1	B	
H2	I-80 - EB	HOV	I-80/I-580 (Merge)	Powell	Emery, Berk	N	0.54	1	6	59.6	B	
H3	I-80 - EB	HOV	Powell	Ashby	Emery, Berk	N	0.72	1	6	61.4	A	
H4	I-80 - EB	HOV	Ashby	University	Emery, Berk	N	1.30	1	6	60.8	A	
H5	I-80 - EB	HOV	University	Jct I-580 (off)	Berk, Alb	N	1.37	1	6	64.1	A	
H6	I-80 - EB	HOV	Jct I-580 (off)	Central (County Line)	Berk, Alb	N	0.84	1	6	61.4	A	
H7	I-80 - WB	HOV	Central (County Line)	Jct I-580	Berk, Alb	N	0.70	1	6	20.4	F	
H8	I-80 - WB	HOV	Jct I-580	University	Berk, Alb	N	1.51	1	6	28.1	F	
H9	I-80 - WB	HOV	University	Ashby	Emery, Berk	N	1.31	1	6	34.2	E	
H10	I-80 - WB	HOV	Ashby	Powell	Emery, Berk	N	0.71	1	6	42.3	D	
H11	I-80 - WB	HOV	Powell	I-80/I-580 (Split)	Emery, Berk	N	0.47	1	6	31.5	E	
H12	I-80 - WB	HOV	I-580 Split	Toll Plaza	Oak	N	1.31	1	6	30.1	E	
H13	I-80 - WB	HOV	Toll Plaza	End of HOV	Oak	N	0.21	1	6	44.9	D	
H14	SR 84 - WB	HOV	I-880 NB (off)	Ardenwood/Newark	New	S	1.01	1	6	57.6	B	
H15	SR 84 - WB	HOV	Ardenwood/Newark	Paseo Padre Pkwy	New	S	1.15	1	6	57.9	B	
H16	SR 84 - WB	HOV	Paseo Padre Pkwy	Toll Gate	Fre	S	0.54	1	6	31.8	E	
H17	SR 92 - WB	HOV	Begin of HOV (Hesperian Blvd)	Clawiter	Hay	C	1.17	1	6	25.4	F	
H18	SR 92 - WB	HOV	Clawiter	Toll Plaza	Uninc, Hay	C	1.88	1	6	42.1	D	
H19	I-580 - EB	HOV	Hopyard	Santa Rita	Plea	E	1.90	1	6	67.4	A	[1]
H20	I-580 - EB	HOV	Santa Rita	El Charro	Uninc, Plea	E	1.25	1	6	74.4	A	[1]
H21	I-580 - EB	HOV	El Charro	SR 84/Airway Blvd.	Uninc	E	1.72	1	6	74.9	A	[1]
H22	I-580 - EB	HOV	SR 84/Airway Blvd.	Portola	Uninc	E	1.73	1	6	73.6	A	[1]
H23	I-580 - EB	HOV	Portola	1st St	Liv	E	2.56	1	6	70.5	A	[1]
H24	I-580 - EB	HOV	1st St	Greenville	Liv, Uninc	E	2.13	1	6	73.3	A	[1]
E1	I-680 - SB	Express Ln	Begin of HOV (Rt 84)	Washington Blvd Entry Point	Uninc, Fre	S	5.74	1	6	64.5	A	
E2	I-680 - SB	Express Ln	Washington Blvd Entry Point	Auto Mall Pkwy Exit Point	Fre	S	1.32	1	6	64.0	A	
E3	I-680 - SB	Express Ln	Auto Mall Pkwy Exit Point	Mission Blvd Entry Point	Fre	S	1.07	1	6	56.8	B	
E4	I-680 - SB	Express Ln	Mission Blvd Entry Point	Ala border (S of Scott Creek Rd)	Fre	S	3.03	1	6	69.0	A	
H25	I-880 - NB	HOV	Begin HOV	I-880/I-80 Split (16th Street)	Oak	N	0.17	1	12	54.0	C	
H26	I-880 - NB	HOV	I-880/I-80 Split (16th Street)	Toll Plaza	Oak	N	1.40	1	12	44.5	D	

Appendix B. 2014 Level of Service Results

Table B-11: 2014 LOS Monitoring Results for HOV/Express Lanes - AM Peak Period (Floating Car Surveys)

CMP ID	CMP Route	Type	Segment Limits		Jurisdiction	Plan Area	Length (mi)	# Lanes	2014 LOS Results			Note
			From	To					# Runs	Speed	LOS	
H27	I-880 - NB	HOV	Begin HOV (W Grand Ave)	I-880/I-80 Merge	Oak, Emery	N	1.10	1	7	52.5	C	
H28	I-880 - NB	HOV	SCL County Line	SR 262/Mission	Fre	S	2.01	1	6	70.1	A	
H29	I-880 - NB	HOV	SR262/Mission	AutoMall Pkwy	Fre	S	2.43	1	6	70.3	A	[1]
H30	I-880 - NB	HOV	AutoMall Pkwy	Stevenson Blvd	Fre	S	1.53	1	6	70.1	A	
H31	I-880 - NB	HOV	Stevenson Blvd	Decoto	Fre	S	4.06	1	6	70.3	A	
H32	I-880 - NB	HOV	Decoto	Alvarado Blvd	Fre	S	1.17	1	6	69.2	A	
H33	I-880 - NB	HOV	Alvarado Blvd	Alvarado-Niles Blvd	Fre, Uni Cty	S	1.57	1	6	67.2	A	
H34	I-880 - NB	HOV	Alvarado-Niles Blvd	Tennyson	Uni Cty, Hay	S	2.60	1	6	59.0	B	
H35	I-880 - NB	HOV	Tennyson	SR 92	Hay	C	1.02	1	6	60.0	B	
H36	I-880 - NB	HOV	SR 92	A St	Hay	C	1.68	1	6	61.6	A	
H37	I-880 - NB	HOV	A St	End of HOV	Uninc	C	0.77	1	6	63.1	A	
H38	I-880 - SB	HOV	Begin HOV (South of Marina Blvd)	SR 238 WB (Merge)	San L	N	2.18	1	6	46.0	D	[1]
H39	I-880 - SB	HOV	SR 238 WB (Merge)	A St	San L, Uninc	C	1.91	1	6	31.2	E	
H40	I-880 - SB	HOV	A St	Rt 92/Jackson	Hay	C	1.70	1	5	51.0	C	
H41	I-880 - SB	HOV	Rt 92/Jackson	Tennyson	Hay	C	1.01	1	5	44.8	D	
H42	I-880 - SB	HOV	Tennyson	Alvarado-Niles	Hay, Uni Cty	C	2.60	1	5	45.6	D	
H43	I-880 - SB	HOV	Alvarado-Niles	Alvarado	Uni Cty, Fre	C	1.56	1	5	43.5	D	
H44	I-880 - SB	HOV	Alvarado	Decoto	Fre	C	1.19	1	5	49.9	C	
H45	I-880 - SB	HOV	Decoto	Stevenson	Fre	S	4.06	1	5	51.0	C	
H46	I-880 - SB	HOV	Stevenson	AutoMall Pkwy	Fre	C	1.52	1	5	54.3	C	
H47	I-880 - SB	HOV	AutoMall Pkwy	Rt 262/Mission	Fre	C	2.83	1	5	55.3	B	[1]
H48	I-880 - SB	HOV	SR 262/Mission	SCL County Line	Fre	S	1.61	1	5	58.9	B	

Comments

[1] Data impacted by long term construction or recurrent lane closures

B.6 | Bridges to SF/Peninsula

Table B-12: 2014 LOS Monitoring Results for Bridges - PM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2014 results			Note
		From	To					Sample	Speed	LOS	
F151	SR 92 - WB	San M CL	Foster City Boulevard	SM	4.97	C	3	3641	66.0	A	
F152	SR 92 - EB	Foster City Boulevard	San M CL	SM	4.97	C	3	3430	41.0	D	[1]
F153	SR 84 - WB	San M CL	Ravenswood Slough	SM	1.31	S	3	2639	61.7	A	
F154	SR 84 - EB	Ravenswood Slough	San M CL	SM	1.31	S	3	3775	52.3	C	
F155	I-80 - WB	SF County Line	Fremont St Off Ramp	SF	3.32	N	5	3543	28.2	(F30)	
F156	I-80 - EB	Bryant St On Ramp	SF County Line	SF	3.29	N	5	3299	37.0	E	[1]

Comments

[1] Data impacted by long term construction and recurrent lane closures

Table B-13: 2014 LOS Monitoring Results for Bridges - AM Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2014 results			Note
		From	To					Sample	Speed	LOS	
F151	SR 92 - WB	San M CL	Foster City Boulevard	SM	4.97	C	3	3656	47.8	D	
F152	SR 92 - EB	Foster City Boulevard	San M CL	SM	4.97	C	3	3772	65.9	A	[1]
F153	SR 84 - WB	San M CL	Ravenswood Slough	SM	1.31	S	3	3772	37.5	E	
F154	SR 84 - EB	Ravenswood Slough	San M CL	SM	1.31	S	3	3290	60.1	A	
F155	I-80 - WB	SF County Line	Fremont St Off Ramp	SF	3.32	N	5	3775	46.3	D	
F156	I-80 - EB	Bryant St On Ramp	SF County Line	SF	3.29	N	5	3540	50.4	C	[1]

Comments

[1] Data impacted by long term construction and recurrent lane closures

Table B-14: 2014 LOS Monitoring Results for Bridges - Weekend Peak Period (INRIX data)

CMP ID	CMP Route	Segment Limits		Jurisdiction	Length (mi)	Plan Area	# Lanes	2014 results			Note
		From	To					Sample	Speed	LOS	
F151	SR 92 - WB	San M CL	Foster City Boulevard	SM	4.97	C	3	3081	67.0	A	
F152	SR 92 - EB	Foster City Boulevard	San M CL	SM	4.97	C	3	3056	66.7	A	[1]
F153	SR 84 - WB	San M CL	Ravenswood Slough	SM	1.31	S	3	2047	61.8	A	
F154	SR 84 - EB	Ravenswood Slough	San M CL	SM	1.31	S	3	2272	60.7	A	
F155	I-80 - WB	SF County Line	Fremont St Off Ramp	SF	3.32	N	5	3082	38.3	E	
F156	I-80 - EB	Bryant St On Ramp	SF County Line	SF	3.29	N	5	3089	51.6	C	[1]

Comments

[1] Data impacted by long term construction and recurrent lane closures

Appendix C. 2014 Updates to the CMP network

This appendix documents changes to the CMP network observed during the 2014 LOS monitoring cycle.

C.1 | Arterials (Tier 1)

Table C-1 lists the physical changes to CMP segments since 2012 monitoring cycle.

Table C-1: Changes to Arterials (Tier 1) in 2014

ID	Description	Length (mi)	Comment	Details
A4	A Street – EB: Western to SR185	0.31	CMP segment is shortened	Implementation of Hayward Loop - Part of A street has been converted to a one way street between SR185 and SR 238. This CMP segment is now shortened and runs between SR 185 (Mission) and Western Blvd.
A216	SR 238 (Foothill) – SB: City Center to A Street	0.16	CMP segment is shortened	Implementation of Hayward Loop - Part of SR238 has been converted to a one way street between Jackson and A Street. This CMP segment is now shortened and runs between A Street and City Center.
A198	SR 185 Hayward – NB: A Street to Sunset	0.43	CMP segment is shortened	Implementation of Hayward Loop - Part of SR185 has been converted to a one way street between SR 238 and A Street. This CMP segment is now shortened and runs between A Street and Sunset.
A233	SR 84 (Liv) - NB – realign: Airway to I-580 WB (off)	0.52	New route	The connection between SR 84 and I-580 was realigned since the last LOS monitoring. The state route no longer travels along Airway Blvd. This segment is newly added to cover the new portion of the state route.
A234	SR 84 (Liv) - NB – realign (I-580 WB (off) to Airway	0.53	New route	The descriptions on segments A137 and A138 for the previous SR 84 alignment were updated so they no longer represent state route.

C.2 | Arterials (Tier 2)

Similar to arterials (Tier 1), **Table C-2** lists the physical changes to CMP segments.

Table C-2: Changes to Arterials (Tier 2) in 2014

ID	Description	Length (mi)	Comment	Details
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB: Webster to East side of Lake Merritt Channel	0.66		
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB: East side of Lake Merritt Channel to MacArthur Blvd/I-580 On Ramp	1.15	Road	Completion of 12th Street Reconstruction Project - Significant construction was undertaken on Lake Merritt Blvd. 11th & 12th Street now come to a T-intersection at Lake Merritt Blvd. Further the connection between Lake Merritt Blvd and 12th Street and International Blvd has been changed.
T10	12th St - Lake Merritt Blvd - Lakeshore Ave-WB: MacArthur Blvd/I-580 On Ramp to East side of Lake Merritt Channel	1.15	Realignment	
T11	12th St - Lake Merritt Blvd - Lakeshore Ave-WB: East side of Lake Merritt Channel to Webster	0.64		

C.3 | HOV and Express Lanes

In this monitoring cycle, HOV and express lanes were added to the CMP network for performance monitoring (information only). Refer to **Table C-3**. This category of CMP segments included HOV and express lanes present on the mainline freeways within the CMP freeway network. HOV lanes on arterials or ramps were not included.

Table C-3: 2014 HOV and Express Lanes

Route / Direction	HOV	EL*	Description	Length (mi)
80/EB	✓		Bay Bridge Toll Plaza (near 580 Diverge) to CC County Line (S of Central Av)	5.5
80/WB	✓		CC County Line (S of Central Av) to Bay Bridge Toll Plaza	6.2
84/WB	✓		I-880 to Dumbarton Bridge Toll Plaza	2.7
92/WB	✓		Hesperian Blvd to San Mateo Bridge Toll Plaza	3.1
580/EB	✓		Hopyard Rd/Dougherty Rd to North Greenville Road	11.3
680/SB		✓	State Route 84 to Alameda border (South of Scott Creek Rd)	11.2
880/NB	✓		Dixon Landing Road to south of I-580	18.8
880/NB	✓		13 th Street to Toll Plaza	1.6
880/NB	✓		West Grand Ave to I-880/I-80 Merge	1.1
880/SB	✓		South of Marina Blvd to Dixon Landing Road	22.2

*EL: Express Lane

C.4 | Bridges connecting to SF/Peninsula

While previous monitoring efforts contained bridge crossing performance information, the end points of the bridge monitoring were updated in 2014. In 2014, the bridge segments were added to the GIS network to extend from the county line until the first ramp after the bridge (**Table C-4**). Note that the connecting sections of the bridges within Alameda County were already included in the freeway CMP network.

Table C-4: 2014 Bridge Crossings

Bridge	Between	Length (mi)	Comments
Bay Bridge	County line & Fremont Street	3.3	Eastern span runs along new Bay Bridge alignment.
San Mateo Bridge	County line & Foster City Boulevard	5.0	
Dumbarton Bridge	County line & first exit (service road)	1.3	

C.5 | Origin Destination Surveys

Table C-5 lists the changes to origin destination surveys. Other updates were made to descriptions to reflect changing occupants at the employment center end point. Also, lengths of routes were updated.

Table C-5: Changes to Origin Destination Surveys

ID	Description	Length (mi)	Modes Impacted	Details
2	Emeryville to Berkeley	4.8	Transit/Bike	Bus route updated to reflect new timetable option. Bike route designated.
3	Hayward to Livermore	20.6	Auto	As discussed in Table C-1 , the freeway connection between the I-580 and SR 84 was moved. The OD Survey adopted the new freeway exit.
5	Fremont to Pleasanton	15.7	Transit	Transit route updated to quicker option.
6	Fremont to San Jose	14.3	Transit	Transit route updated to quicker option.
10	Alameda to Oakland	5.7	Transit	Transit route updated to quicker option.

Appendix D. Corridor Analysis

This appendix compares the afternoon peak period travel time and speed data on selected freeway and arterials corridors.

Table D-1: Comparison of PM Peak Period Travel Time & Speed on Selected Freeway Routes (1991-2014)

CMP Route	Dir	From	To	Length (miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014
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
					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
	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
					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
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
					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
	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
					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
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
					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
	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
					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
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
					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
	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
					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
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
					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
	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
					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
SR 13	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
					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
	SB	Hiller	Jct I-580	5.45	6:04	5:46	6:31	6:55	5:31	5:59	5:58	6:03	7:19	7:15	9:02	5:43	8:29
					56.4	59.4	52.5	47.2	59.1	59.5	54.6	54.1	48.7	49.0	39.4	42.7	41.9

Table D-1: Comparison of PM Peak Period Travel Time & Speed on Selected Freeway Routes (1991-2014)

CMP Route	Dir	From	To	Length (miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014
SR 24	EB	I-580 (on)	Fish Ranch	4.52	9:19	9:35	9:25	11:10	6:59	8:08	12:41	6:48	10:39	11:32	15:31	15:32	17:36
					30.1	29.2	29.8	24.3	38.9	33.4	21.4	39.9	25.5	23.5	17.5	17.5	15.4
	WB	Fish Ranch	I-580 (Off)	4.47	5:00	4:58	5:01	5:24	4:30	4:41	4:26	4:34	5:03	5:05	4:11	4:15	4:53
					54.0	58.0	54.0	50.0	60.0	57.0	60.5	58.7	58.8	58.4	66.6	59.5	56.4

Table D-2: Comparison of PM Peak Period Travel Time & Speed on Selected Arterial Routes (1991-2014)

CMP Route	Dir	From	To	Length (miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014
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
					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
	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
					19.4	20.9	19.1	20.7	20.7	19.5	19.3	19.1	18.5	16.4	15.5	16.8	17.4
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
					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
	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
					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
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
					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
	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
					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
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
					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
	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
					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
SR 84 Livermore	WB	I-580 WB	Isabel	*5.23 -4.14	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
					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
	EB	Isabel	I-580 WB	*5.23 -4.14	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
					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
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
					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
	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

Table D-2: Comparison of PM Peak Period Travel Time & Speed on Selected Arterial Routes (1991-2014)

CMP Route	Dir	From	To	Length (miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014			
SR 185	SB	42nd St	SR 92/238	10.46	20.1	21.1	18.0	18.5	12.6	17.6	14.4	16.4	14.3	13.9	18.2	15.7	14.0			
					18:55	4:47	n/a	6:31	5:12	8:11	6:56	6:00	5:31	10:22	10:41	12:00	40:07			
					14.1	21.8	n/a	20.6	21.5	19.3	20.3	18.8	18.3	18.0	18.1	17.4	15.7			
	NB	SR 92/238	42nd St	10.31	14:34	4:54	n/a	4:40	7:02	5:34	5:36	10:36	10:50	7:08	8:27	11:22	36:37			
					18.6	21.7	n/a	21.8	20.2	21.3	21.2	17.9	17.8	20.0	19.1	17.5	16.6			
SR 238 Mission	NB	I-680 NB	Jackson	12.39	0:05	n/a	3:30	3:10	3:04	2:37	6:05	6:30	3:55	3:55	3:45	7:32	27:34			
					30.7	n/a	26.9	27.3	27.4	29.2	24.6	24.4	26.6	26.6	26.8	23.6	27.5			
					0:28	n/a	4:15	2:45	3:20	0:26	2:13	4:27	2:45	8:04	3:09	5:05	43:19			
	SB	Jackson	I-680 NB	12.36	30.3	n/a	26.2	27.7	27.1	31.0	28.2	26.1	27.7	23.1	27.3	24.9	17.5			
MLK/Shattuck Ave	NB	SR 24	University	2.78	7:02	6:43	6:07	12:01	11:41	11:16	11:54	11:47	11:50	12:05	10:02	10:44	10:52			
					17.2	18.3	20.1	13.7	14.3	14.8	14.0	14.2	14.1	13.8	16.6	15.6	18.0			
					10:07	9:12	9:59	6:14	10:45	12:01	12:45	10:50	9:55	11:11	9:53	10:53	14:09			
	SB	University	SR 24	2.76	16.4	18.0	16.6	15.7	15.4	13.8	13.0	15.3	16.7	14.8	16.8	15.2	13.4			
University Ave	EB	I-80 Off	Shattuck Pl	2.05	7:02	6:43	6:07	7:07	5:02	8:05	7:36	7:43	7:31	7:31	7:23	7:48	7:00			
					17.5	18.3	20.1	17.2	16.7	15.2	16.2	15.9	16.4	16.4	16.7	15.8	17.7			
					6:38	6:30	7:07	6:28	9:51	7:45	7:01	8:23	7:24	7:00	7:08	8:39	10:07			
	WB	Shattuck Pl	I-80 Off	2.05	18.5	18.9	17.3	16.5	12.5	15.9	17.5	14.7	16.6	17.6	17.3	14.2	12.2			
Decoto Rd/Dumbarton Bridge	WB	Hwy 238	County Line	8.97	11:46	12:43	13:56	16:30	13:58	14:54	17:25	16:12	15:51	15:21	14:21	14:44	15:14			
					45.7	42.3	38.6	32.6	38.5	37.3	30.9	33.2	33.9	35.1	37.3	36.5	35.8			
					12:41	14:01	14:40	17:49	17:06	15:50	14:35	17:01	16:32	19:23	16:30	6:14	20:59			
	EB	County Line	Hwy 238	8.36	42.3	28.3	36.6	30.0	31.4	34.9	36.8	29.5	30.3	25.9	30.4	27.2	26.0			
SR 84 Niles Canyon	EB	SR 238	Isabel	*13.27 -15.35	n/a	n/a	4:48	1:17	n/a	5:20	14:08	13:02	6:13	3:01	5:20	4:49	28:58			
					n/a	n/a	36.4	34.3	n/a	31.4	24.2	24.4	26.4	29.4	27.8	28.3	27.6			
	WB	Isabel	SR 238	*12:93 -15.01	n/a	n/a	8:52	13:55	n/a	19:56	22:41	0:42	21:55	16:28	17:49	17:28	17:42			
					n/a	n/a	42.7	41.4	n/a	45.9	39.7	40.8	35.4	40.9	44.7	45.6	43.9			

Appendix E. 2014 OD Pairs Results

Table E-1 shows the OD results between 1998 and 2014. **Table E-2** shows the corresponding origins, destinations and routes taken by each mode.

Table E-1: 2014 OD Pair Results

ID	Origin	Destination	Mode	Distance (mi)	1998	2000	2002	2004	2006	2008	2010	2012	2014			
					Av. Travel time (min)								# Runs	Av. Travel Time (min)	Range	Variation to previous
1 (PM)	Hayward	Newark	Auto	7.9	24	22	22	16	19	14	15	14	4	18	15-20	4
			Transit		88	92	79	90	86	74	57	76	2	62	50-73	-14
2 (PM)	Emeryville	Berkeley	Auto	4.8	25	26	25	28	22	22	24	---	4	22	19-25	-2
			Transit		61	---	56	53	45	70	59	---	2	61	59-63	2
			Bike		33	30	30	33	30	32	47	---	2	48	46-49	0
3 (PM)	Hayward	Livermore	Auto	20.6	53	45	49	61	61	54	51	38	4	53	42-67	15
			Transit		144	152	141	120	113	143	---	112	2	126	108-144	14
4 (PM)	Oakland	San Leandro	Auto	11.3	35	29	32	41	34	27	27	24	4	36	29-41	12
			Transit		74	64	56	70	66	78	67	76	2	51	51-52	-25
5 (PM)	Fremont	Pleasanton	Auto	15.7	31	34	33	27	39	26	37	---	4	39	33-42	2
			Transit		130	122	125	146	181	145	154	---	2	103	98-109	-51
6 (AM)	Fremont	San Jose	Auto	14.3	39	55	49	30	33	27	28	28	3	45	33-54	13
7 (AM)			Transit		129	104	118	94	111	82	73	93	2	56	52-60	-37
			HOV	14.3	---	35	34	27	25	23	23	25	4	38	27-46	10
8 (PM)	Oakland	Pleasanton	Auto	29.1	58	60	62	45	57	41	52	---	4	51	47-56	-1
			Transit		81	96	91	77	75	107	74	---	2	78	76-80	4
9 (PM)	Fremont	Alameda	Auto	22.6	50	57	53	64	52	43	48	40	4	53	48-60	13
			Transit		86	74	70	123	102	94	91	88	2	79	77-82	-9
10 (PM)	Alameda	Oakland	Auto	5.7	21	17	21	22	21	22	24	---	4	22	19-24	-2
			Transit		51	47	45	45	43	51	52	---	2	52	50-54	0

Table E-2: Descriptions of Origins, Destinations & Routes

#	Origin	Destination	Transit Route	Highway Travel	Bicycle Travel
1 (PM)	Hayward Kaiser Medical Ctr, 27400 Hesperian Blvd	Newark 2004-2014: Residence near Thornton Ave. & Ruschin Dr	2008-2014: Walk to Hesperian, AC 97 to AC Transbay SB Line/SB Newark at Union City Blvd/Whipple Rd to Newark Blvd/Mayhews Landing Rd, walk to door.	2004-2014: Walk to parking; Hesperian to Tennyson to I-880; exit Thornton to Ruschin; park & walk to door.	
2 (PM)	Emeryville Chiron Office Building, 4560 Horton St	Berkeley Residence near Marin Circle at Los Angeles Ave.	2014: Walk to 40th & Horton, AC Transbay F, AC 25 exit at Hopkins Street/the Alameda, walk to door.	1996-2014: Walk to parking; 53rd St, San Pablo Ave, Hopkins St, Marin Circle; park & walk to door.	2014: Bicycle to 59th St, Doyle St, Murray St, 9th St, Cedar St, Hopkins St, Sutter St, Del Norte St, Los Angeles Ave; dismount & walk to door.
3 (PM)	Hayward Cal State University at Carlos Bee Ave	Livermore Residence near Delaware Way & North Murrieta. (2004 onwards)	2004-2014: Walk to AC 92 (AC 60 since 2012), to Hayward BART, BART to Dub/Pleasanton Station, Wheels 12, 12X or 12 V to N. Murietta & Portola (DelNorte in 2008-2014); walk to door.	2014: Walk to parking; Carlos Bee, to Mission Blvd, to A St, Redwood Rd, I-580 EB, Livermore Ave, Portola Ave, Murrieta Blvd, Hurton Rd, Delaware Way; park & walk to door.	
4 (PM)	Oakland Downtown Oakland 1333 Broadway Building	San Leandro Residence near Farnsworth St & Chapel Ave.	2010-2014: Walk to BART 12th St Station; BART to Bayfair BART Station, AC 89 to Farnsworth/Manor Blvd; walk to door.	1996-2014: Walk to parking; local streets to I-880, Marina Blvd, Merced St, Wicks Blvd, Manor Blvd, Wiley St; park & walk to door.	
5 (PM)	Fremont Tesla Plant 45500 Fremont Blvd	Pleasanton 2004-2014: Residence near Hansen/Valley Ave	2010-2014: Walk to AC 212, 218 or 218 to Fremont BART, BART to Dublin/Pleasanton Station, walk to WHEELS 8 to Hansen & Valley; walk to door.	2014: Walk to parking; Fremont Blvd, Auto Mall Pkwy, I-680, Bernal Ave, Valley Ave, Hansen; park & walk to door.	
6 (AM)	Fremont Residence near Thornton Ave at Fremont Blvd	San Jose Cisco, 3801 Zanker Rd at Tasman	2014: Walk to ACE Fremont Station, walk to Tasman/Centennial, VTA 330; walk to door.	1998-2014: From residential driveway, Thornton Ave, CA-84, I-880, SR 237, Zanker; park & walk to door.	
7 (AM) HOV route	Fremont Residence near Thornton Ave at Fremont Blvd	San Jose Cisco, 3801 Zanker Rd at Tasman		1998-2014: From residential driveway, Thornton Ave, CA-84, I-880 HOV lanes, SR 237, Zanker; park & walk to door.	
8 (PM)	Oakland Federal Building, Jefferson St at 14th St	Pleasanton 2004-2014: Residence near Hansen/Valley Ave	2010: Walk to BART 12th St Station; BART to Richmond/Fremont, transfer at Bayfair for BART to Dublin/Pleasanton Station, Wheels 8, 8A, 54 to Valley near Hansen Dr; walk to door.	2010-2014: local streets to I-980 E, I-580 E, Hopyard Rd, Valley Ave, Hansen Dr; park & walk to door.	
9 (PM)	Fremont Washington Hospital at Mowry Ave	Alameda Bay Farm Island Residence near Sea Bridge at Robert Davey Jr	2012-2014: Walk to Fremont BART; BART to Fruitvale, AC 0 or 21 to Robert Davey Jr & Packet Landing Rd; walk to door.	2004-2014: Walk to parking; Mowry to I-880, 98th Ave, Doolittle Dr, Island Dr; park & walk to door.	

Appendix E. 2014 OD Pairs Results

#	Origin	Destination	Transit Route	Highway Travel	Bicycle Travel
10 (PM)	Alameda Naval Air Station, Atlantic at Main	Oakland Business near College Ave at Lawton	2014: Walk to Transit stop; AC 31 to 12th Street & Broadway, BART 12th St Station to Rockridge; walk to door.	2010-2014: Main St, Appezzato Pkwy, CA-260 N/CA-61 N/Webster St, Posey Tube, Broadway, Telegraph, College Ave; park & walk to door.	

Appendix F. 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 below.



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

Further explanation of each step is provided below.

F.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 0.3 miles in length (range: 11 feet to 4.2 miles)¹.

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 1.4 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 2014 TMC links.

It should be noted that for some CMP segments, the ends of the CMP did not align with the ends of the TMCs. **Figure F-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.

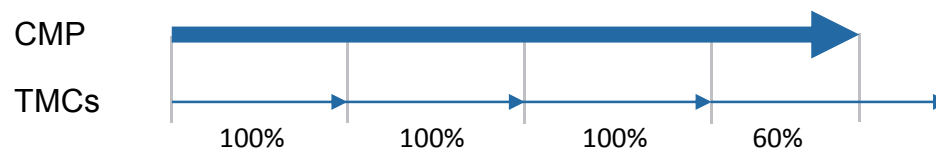


Figure F-2: End points of CMP and TMC do not align

F.2 | Step 2. Filter Raw Data

The raw INRIX data was filtered to remove:

¹ TMC length statistics are based on TMCs used in this monitoring project.

- 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 30s 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.

F.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 18 million data points of INRIX speed data. **Table F-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 F-2**.

Table F-1: Sample INRIX Input Data

TMC Code	Time Stamp	Speed (mph)	Travel time (min)	Score
105+04359	2014-03-01 13:00:00	71	1.04	30
105N04358	2014-03-01 13:00:00	70	0.55	30

Table F-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	3302	58.6
F2	I-80 – EB: Toll Plaza to I-580 SB Merge	Oak	1.3	3728	60.6

The following steps describe how the dataset was restructured to obtain the results in **Table F-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.

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

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 F-3**).

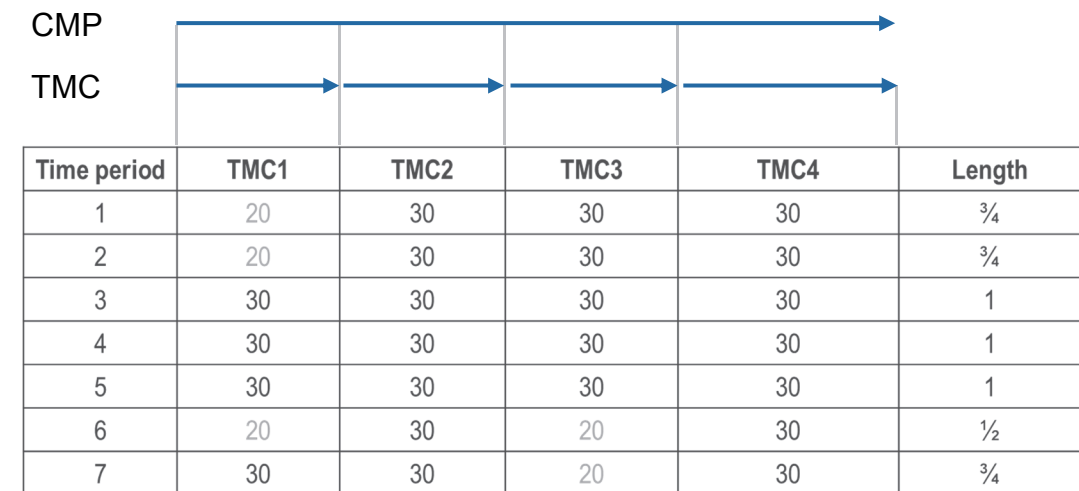


Figure F-3: Example of Filtering Process

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 100 was used.

The remainder of this section gives information about the sample sizes observed on all CMPs. Note that there are 300 CMP segments measured with commercial speed data each having an AM and PM measurement of average speed. This totals 600 measurements.² **Figure F-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).

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

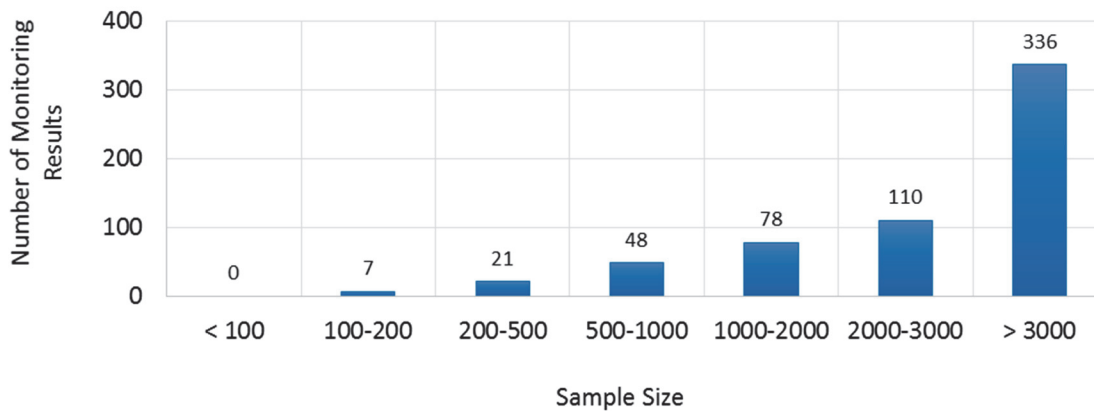


Figure F-4: Histogram of Sample Sizes for CMP Segments Monitored using Commercial Speed Data

² Segments measured using floating car surveys were excluded from this analysis of sample size.

Appendix G. Technical details for Field Surveys

G.1 | Approach for Arterials (Tier 1 and 2) and HOV

Floating car surveys were conducted on arterials (Tier 1), HOV lanes and a portion of arterials (Tier 2). Although minimal, floating car surveys were also undertaken on two freeway and ramp segments (Tier 1). The freeway segments were also collected on a Saturday between 1-3 p.m.

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 Travel³ 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:

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

G.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;

³ PC Travel <http://www.pc-travel.com/>

- Two transit surveys, where the surveyor rode transit as a passenger; and
- Two bike surveys using the same bike rider.

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 H. Free Flow Speed Surveys

Floating car surveys were conducted on the Tier 2 network for the first time in 2012. However, in 2012 it was not possible to calculate the LOS without additional free flow speed information, which was needed in order to classify each arterial segment into a HCM arterial class. Therefore Alameda CTC also carried out free flow speed surveys in 2014. This section details the methodology and results of the free flow speed data collection and analysis.

The purpose of this section is to:

- Determine the hours of the day in which free flow speed surveys can occur for both floating car surveys and when using Inrix data;
- Describe the methodology used for analyzing the Free Flow Speed on Tier 2 network; and
- Present the free flow speed results and corresponding roadway class for CMP segments where INRIX data is used.

H.1 | Background

Per the defined scope of work for 2014 LOS monitoring, performance data is being collected for Tier 2 network using both floating car surveys and INRIX data. Where INRIX data is utilized for LOS monitoring, INRIX data is also used to determine the free flow speed. Similarly, floating car run surveys would be conducted on the remaining Tier 2 CMP segments for both LOS monitoring and free flow analysis.

H.2 | Determination of Hours for Free Flow Speed Measurements

Prior to free flow speed data collection, it was necessary to determine the hours in which free flow speed data can be collected.

The FHWA information guide⁴ on speed concepts defines free flow speed as the speeds at which vehicles are operating during free flow conditions unimpeded by traffic control devices or by other vehicles. The 85th percentile of the distribution of observed speeds is the most frequently used measure of the operating speed. The 85th percentile speed is typically measured during hours when drivers can travel freely, but still perceive there is a chance of enforcement. Therefore hours of the day such as 2am are often excluded as speeding behavior is more prominent. This factor was kept in mind when analyzing Inrix data.

Distributions of speed for a sample of 24 CMP segments with INRIX data were reviewed to determine reasonable times for off peak speeds. This exploratory analysis was performed using both the weekday and weekend data for the sample segments. For weekend data, no evident peaks or patterns were noted and therefore weekend data was disregarded for the purposes of the free flow speed analysis. However the weekday data more evidently indicated a non-peak period in between the AM/PM peak periods. Note that some CMP segments had a nearly uniform speed distribution throughout the day.

Based on this exploratory analysis, majority of the CMP segments were observed to have free flow speeds spread during the following hours:

- Prior to 6:30 AM

⁴ Federal Highway Administration (FHWA). Speed Concepts: Information Guide. September 2009

- Between 9:30 AM and 12:00 PM
- After 8:00 PM

Lastly, these time periods were modified to account the local behavior in certain parts of the county. **Table H-1** summarizes the finalized time periods for conducting the free flow speed surveys utilizing the floating car survey method:

Table H-1: Proposed Time Periods for conducting Free Flow Speed Surveys (Floating car method)

For Oakland (CMPs north of 14th Av), Berkeley, Albany, Emeryville Area	For all other Tier 2 CMP segments:
Prior to 6:30 AM After 8:00 PM	Prior to 6:30 AM Between 9:30 AM and 12:00 PM After 8:00 PM

Note that while fields labelled in the INRIX data as 85th percentile speed were explored, they were disregarded as they were more similar to maximum speed.

Floating car surveys are conducted in accordance with the road rules (i.e. speed limit) and therefore it is only necessary to identify times of low traffic volumes so that the survey vehicle can travel unimpeded. This is the reason why overnight times can be utilized, even though many of the other vehicles could be speeding. This differs for commercial speed data as it captures the actual driving behavior of the population; however this free flow analysis should not include excessive speeding. The next section discusses the monitoring times periods for free flow analysis using Inrix data.

H.2.1 | Monitoring Time Period & Days with Commercial Speed Data

Monitoring time periods for commercial speed data were also determined based on the analysis described in the previous section; however it was necessary to exclude times impacted by excessive speeding behavior.

Using INRIX data, it was possible to achieve an adequate sample size using the data obtained from the time periods between 6:00 am to 6:30 am and 8:00 pm to 9:00 pm for majority of the segments. Hence, the time periods prior to 6:00 AM, after 9:00 PM and in between 9:30 AM and 12:00 PM were excluded in INRIX data analysis. This ensures that the obtained results better represent the free flow speeds during off-peak hours. Refer to **Table H-2**.

Table H-2: Time Periods for analyzing INRIX Data

For all other Tier 2 CMP segments:
6:00 AM to 6:30 AM 8:00 PM to 9:00 PM

Additionally, the data for the free flow analysis was processed to include only the weekdays during the months of January to April during 2014. It may be noted that this includes additional months of January and February that are not used in the actual monitoring months for this project. Since, the objective of the free flow analysis is to categorize Tier 2 segments, it was deemed appropriate to include all the available months in 2014 to obtain better representative results that ensures accurate classification of Tier 2 segments.

H.3 | Analysis

INRIX data was used to analyze and obtain free flow speed on 124 Tier 2 CMP segments. The processing and aggregation methods used were similar to those used for the normal LOS monitoring. Free flow speed measurements were obtained from floating car surveys on the remainder of the segments. These results are shown in **Table H-7**.

H.4 | Defining the Arterial Class

H.4.1 | HCM 1985 and 2000 Guidelines

Arterial or urban street class is a key input to calculating the LOS using HCM 1985/2000 guidelines. In HCM these classes are designated using the numbers I, II, III and IV (IV applicable only to HCM 2000). HCM provides several guidelines to determine these classes. **Table H-3** and **Table H-4** provide two such preliminary guidelines available in HCM 1985 and HCM 2000.

Table H-3: Arterial Class based on Free Flow Speed (Source: Table 11-1 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

Table H-4: Arterial Class based on Free Flow Speed (Source: Exhibit 15-2 HCM 2000)

Arterial 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

Based on the free flow speed analysis results discussed in the previous section, **Table H-3** and **Table H-4** were used as the preliminary source of reference to classify arterials (Tier 2). As seen in these tables, Class I per HCM 1985 and Classes I and II per HCM 2000 were less ambiguous in their definition of speed bins. Classes II and III per HCM 1985 and Classes III and IV per HCM 2000 have speed bins that overlap each other. This implies that free flow speed between 30 mph to 35 mph could be classified under Class II/III per HCM 1985 or Class III/IV per HCM 2000. Further guidelines from HCM were reviewed to determine the arterials classes for such CMP segments with overlapping speed bins. These additional guidelines include the functional and design category definitions/criteria as shown in **Table H-5** and **Table H-6**. Such guidelines were also used to review CMP segments that have free flow speeds in the vicinity of the upper or lower limit of the bins (i.e., in the vicinity of 45 mph, 35 mph etc).

It may be noted that HCM definition of free flow speed excludes control delay. On the other hand, this delay may be captured in the free flow speed results from INRIX or floating car runs. Hence, speed alone may not be sufficient to determine the correct classification of the segments. To account for this, apart from using the function and design category guidelines, additional review was also undertaken as described in the next section.

Table H-5: Function and Design Categories for Arterials (Source: Table 11-2 HCM 1985)

Criteria	Functional Category	
	Principal Arterials	Minor Arterials
Mobility function	Very important	Important
Access function	Very minor	Substantial
Points connected	Freeways, important activity centers, major traffic generators	Principal arterials
Predominant trips served	Relatively long trips between above points and through trips entering, leaving, and going through the city	Trips of moderate lengths within relatively small geographical areas

Criteria	Design Category		
	Suburban Design	Intermediate	Urban Design
Control of access	Partial to almost full	Partial	Little or no control
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided or undivided; one-way; two-lane	Undivided one-way; two-way, two or more lanes
Parking	No parking	Some parking	Parking permitted
Separate left-turn lanes	Yes	Some	No
Signals per mile	1 to 4	4 to 8	8 to 12
Speed limits	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian interference	None	None	Some
Roadside development	Low density	Moderate	High density

Table H-6: Definitions for Arterial Classifications (Source: Table 11-3 HCM 1985)

Design Category	Functional Category	
	Principal Arterial	Minor Arterial
Typical Suburban Design and Control	I	II
Intermediate Design	II	III
Typical Urban Design	III	III

H.4.2 | Additional Examination/Review

As a final step, Iteris used its professional judgment to review the classes for all the CMP segments. For this, virtual survey was performed using aerial imagery and the Google street view to understand the existing field conditions. Based on this survey coupled with local knowledge, classes were re-assigned to some of the CMP segments (based on **Table H-5** and **Table H-6**).

Following are several examples to illustrate the thought process and decisions in re-assigning the classes of some of the segments:

- Example 1: For the CMP segments T17/T24 along Broadway between College Ave and Grand Avenue in Oakland, the calculated free flow speed was around 21 mph based on INRIX data. If **Table H-3** and **Table H-4** were used, these segments would be classified as Class IV/Class III per HCM 2000/1985. However, these segments are not located in the

downtown district and also have a median with two or more lanes in each direction. The adjacent land use development is also generally less pedestrian-oriented than in downtown. Using these findings, the two CMP segments were re-classified to Class III/Class II per HCM 2000/1985.

- Example 2: Similar reasoning noted in Example 1 was used to re-classify the following CMPs along Foothill Boulevard in Oakland. The Classification for CMPs T53/T64, T57/T60, and T58/T65 was changed from Class IV/III to Class III/II.
- Example 3: For CMP segments T144 to T151 along Dublin Boulevard in Dublin, the calculated free flow speeds were between 24 mph to 34 mph. Per **Table H-3** and **Table H-4**, these segments would be classified as Class IV/Class III per HCM 2000/1985. However, most of these segments have two or more lanes in each direction divided by a median with adjacent auto-oriented development. Additionally, the speed limits are noted to be 45 mph/40 mph. Based on these findings T144/T151 and T145/T150 were re-classified to Class III/Class II, and T146/T149 and T147/T148 to Class II/I per HCM 2000/1985.

During this process, care was taken to ensure that same class was assigned to the adjacent CMPs segments with similar characteristics along a corridor. Further, the same class was assigned to arterials which run between the same start and end points but travel in opposite directions. Adjustments were also made to a few CMP segments that are rural in nature. Unlike urban arterial segments, rural roadways segments do not have different categories per HCM 1985 and HCM 2000. These segments were simply classified as rural.

Based on this analysis, the final recommended classification for each CMP segment is included in **Table H-7** along with the free flow speed results.

Note that the free flow speeds for the following segments have been updated to use the AM peak period survey data: T43, T46, T132, T133, T135, T167, T168 and T172. This was based on additional review of the results that indicated free flow speeds to be lower than the AM peak period speeds. This could be due to non-recurring congestion during the free flow survey hours.

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T1	W.Grand Ave - Grand Ave -EB	I-80/Maritime St	San Pablo Ave	Oak	651	26.6	2	3
T2	W.Grand Ave - Grand Ave -EB	San Pablo Ave	Broadway	Oak	2235	19.9	3	4
T3	W.Grand Ave - Grand Ave -EB	Broadway	I-580	Oak	501	21.6	3	4
T4	W.Grand Ave - Grand Ave -WB	I-580	Broadway	Oak	409	21.5	3	4
T5	W.Grand Ave - Grand Ave -WB	Broadway	San Pablo Ave	Oak	868	20.8	3	4
T6	W.Grand Ave - Grand Ave -WB	San Pablo Ave	I-80/Maritime St	Oak	393	28.3	2	3
T7	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	I-980 ON Ramp/Brush St	Webster	Oak	4	14.4	3	4
T8	11th St - Lake Merritt Blvd - Lakeshore Ave-EB *	Webster	East side of Lake Merritt Channel	Oak	4	14.7	3	4
T9	11th St - Lake Merritt Blvd - Lakeshore Ave-EB	East side of Lake Merritt Channel	MacArthur Blvd/I-580 ON Ramp	Oak	4	16.7	3	4
T10	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	MacArthur Blvd/I-580 ON Ramp	East side of Lake Merritt Channel	Oak	4	16.8	3	4
T11	12th St - Lake Merritt Blvd - Lakeshore Ave-WB *	East side of Lake Merritt Channel	Webster	Oak	4	15.9	3	4
T12	12th St - Lake Merritt Blvd - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oak	4	17.4	3	4
T13	Telegraph Ave-NB *	51st Street	Russell St	Oak, Berk	4	15.0	3	4
T14	Telegraph Ave-NB *	Russell St	Bancroft Way	Berk	4	13.5	3	4
T15	Telegraph Ave-SB *	Bancroft Way	Russell St	Berk	4	13.9	3	4
T16	Telegraph Ave-SB	Russell St	51st Street	Oak, Berk	4	18.5	3	4
T17	Broadway-SB	Broadway/College Ave	Grand Ave	Oak	480	20.8	2	3
T18	Broadway-SB	Grand Ave	14th St	Oak	506	18.2	3	4
T19	Broadway-SB	14th St	5th St/Broadway	Oak	1060	17.9	3	4
T20	Broadway (Connection to I-880)-SB *	5th St/Broadway	I-880 ON Ramp	Oak	6945	62.9	1	1
T21	Broadway (Connection to I-880)-NB	I-880 OFF Ramp	5th St/Broadway	Oak	4	23.0	1	2
T22	Broadway-NB	5th St/Broadway	14th St	Oak	1209	17.1	3	4
T23	Broadway-NB	14th St	Grand Ave	Oak	899	18.3	3	4
T24	Broadway-NB	Grand Ave	Broadway/College Ave	Oak	393	21.9	2	3
T25	Durant-EB	Shattuck	College Ave.	Berk	4	16.0	3	4
T26	College Avenue-SB	Bancroft Way/College Ave	Ashby Ave	Berk	573	16.8	3	4
T27	College Avenue-SB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oak, Berk	278	19.7	3	4
T28	College Avenue-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Oak	540	16.7	3	4
T29	College Avenue-NB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Oak	641	17.0	3	4
T30	College Avenue-NB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oak, Berk	574	18.3	3	4

Appendix H. Free Flow Speed Surveys

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T31	College Avenue-NB	Ashby Ave	Bancroft Way/College Ave	Berk	703	16.8	3	4
T32	Bancroft-WB	College Ave.	Shattuck	Berk	4	12.5	3	4
T33	51st Street-EB *	SR 24 Off Ramp/52nd St	Broadway	Oak	4	15.0	3	4
T34	51st Street-WB *	Broadway	SR 24 Off Ramp/52nd St	Oak	4	15.7	3	4
T35	Shattuck Avenue-NB	51 st	Alcatraz Ave.	Oak, Berk	4	22.8	3	4
T36	Shattuck Avenue-NB	Alcatraz Ave.	Adeline St.	Berk	4	16.7	3	4
T37	Shattuck Avenue-SB	Adeline St.	Alcatraz Ave.	Berk	4	17.1	3	4
T38	Shattuck Avenue-SB	Alcatraz Ave.	51 st	Oak	4	17.3	3	4
T39	Powel Street-Stanford Avenue-EB *	NB I-80 OFF Ramp	San Pablo Ave	Emery	4	15.5	2	3
T40	Powel Street-Stanford Avenue-EB	San Pablo Ave	MLK Jr Way	Oak, Berk	4	17.0	2	3
T41	Powel Street-Stanford Avenue-WB *	MLK Jr Way	San Pablo Ave	Oak, Berk	4	19.1	2	3
T42	Powel Street-Stanford Avenue-WB	San Pablo Ave	NB I-80 OFF Ramp	Emery, Oak	4	15.3	2	3
T43	40thStreet-Shellmound Avenue-EB *	Shellmound Way (north of Powell St)	40th St	Emery	7	24.6	2	3
T44	40thStreet-Shellmound Avenue-EB *	40th St	San Pablo Ave	Emery	4	16.5	3	4
T45	40thStreet-Shellmound Avenue-WB *	San Pablo Ave	40th St	Emery	4	22.0	3	4
T46	40thStreet-Shellmound Avenue-WB *	40th St	Shellmound Way (north of Powell St)	Emery	7	29.0	2	3
T47	International Boulevard-NB	42nd Ave	Fruitvale Ave	Oak	893	21.9	3	4
T48	International Boulevard-NB	Fruitvale Ave	14th Ave	Oak	365	22.9	3	4
T49	International Boulevard-NB	14th Ave	Lake Merritt Blvd	Oak	487	22.5	3	4
T50	International Boulevard-SB	Lake Merritt Blvd	14th Ave	Oak	336	21.5	3	4
T51	International Boulevard-SB	14th Ave	Fruitvale Ave	Oak	543	22.9	3	4
T52	International Boulevard-SB	Fruitvale Ave	42nd Ave	Oak	1053	21.4	3	4
T53	73rd Ave -NB	International Blvd/73rd Ave	73rd Ave/Foothill Blvd	Oak	414	28.1	2	3
T54	Foothill Boulevard-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oak	188	20.3	3	4
T55	Foothill Boulevard-NB	Seminary Ave	High Street	Oak	514	21.5	3	4
T56	Foothill Boulevard-NB	High Street	Fruitvale Ave	Oak	499	19.8	3	4
T57	Foothill Boulevard-NB	Fruitvale Ave	14th Ave	Oak	86	22.9	2	3
T58	Foothill Boulevard-NB	14th Ave	1st Ave/Lake Shore Blvd	Oak	285	20.5	3	4

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T60	Foothill Boulevard-SB	14th Ave	Fruitvale Ave	Oak	210	21.8	2	3
T61	Foothill Boulevard-SB	Fruitvale Ave	High Street	Oak	404	20.8	3	4
T62	Foothill Boulevard-SB	High Street	Seminary Ave	Oak	513	20.2	3	4
T63	Foothill Boulevard-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oak	441	21.2	3	4
T64	73rd Ave -SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oak	444	26.9	2	3
T65	E. 15th Street-SB	1st Avenue	14th Avenue	Oak	4	14.8	3	4
T66	High Street-EB	Otis Drive	Central Ave	Ala	4	19.7	3	4
T67	High Street-EB	Central Ave	Fernside Blvd	Ala	4	19.3	3	4
T68	High Street-EB	Fernside Blvd	NB I-880 OFF Ramp	Ala, Oak	4	14.8	2	3
T69	High Street-EB	NB I-880 OFF Ramp	Foothill Blvd	Oak	4	16.3	3	4
T70	High Street-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oak	4	20.9	3	4
T71	High Street-WB	MacArthur Blvd/WB I-580 OFF Ramp	Foothill Blvd	Oak	4	21.2	3	4
T72	High Street-WB	Foothill Blvd	NB I-880 OFF Ramp	Oak	4	16.9	3	4
T73	High Street-WB	NB I-880 OFF Ramp	Fernside Blvd	Ala, Oak	4	21.6	2	3
T74	High Street-WB *	Fernside Blvd	Central Ave	Ala	4	16.8	3	4
T75	High Street-WB	Central Ave	Otis Drive	Ala	4	24.5	3	4
T76	Crow Canyon Road/Grove Way-NB	A Street/Redwood Road	EB I-580 ON Ramp/Grove Way	Ala Cnty	623	29.0	2	3
T77	Crow Canyon Road/Grove Way-NB	EB I-580 ON Ramp/Grove Way	Cull Canyon	Ala Cnty	687	32.1	1	2
T78	Crow Canyon Road-NB	Cull Canyon	Cold Water Dr	Ala Cnty	816	42.3	1	2
T79	Crow Canyon Road-NB	Cold Water Dr	0.43 miles north of Norris Canyon Rd	Ala Cnty	2717	42.0	Rural	
T80	Crow Canyon Road-NB	0.43 miles north of Norris Canyon Rd	County Line	Ala Cnty	2717	42.0	Rural	
T81	Crow Canyon Road-SB	County Line	0.43 miles north of Norris Canyon Rd	Ala Cnty	3447	41.4	Rural	
T82	Crow Canyon Road-SB	0.43 miles north of Norris Canyon Rd	Cold Water Dr	Ala Cnty	3447	41.4	Rural	
T83	Crow Canyon Road-SB	Cold Water Dr	Cull Canyon	Ala Cnty	1216	41.6	1	2
T84	Crow Canyon Road/Grove Way-SB	Cull Canyon	EB I-580 ON Ramp/Grove Way	Ala Cnty	732	36.1	1	2

Appendix H. Free Flow Speed Surveys

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T85	Crow Canyon Road/Grove Way-SB	EB I-580 ON Ramp/Grove Way	A Street/Redwood Road	Ala Cnty	729	30.7	2	3
T86	Winton Avenue - D Street-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hay	5529	25.7	2	3
T87	Winton Avenue - D Street-EB	SB I-880 ON Ramp	Santa Clara St	Hay	4151	33.5	2	3
T88	Winton Avenue - D Street-EB	Santa Clara St	Soto Rd	Hay	4542	24.1	2	3
T89	Winton Avenue - D Street-EB	Soto Rd	Foothill Boulevard/D St	Hay	478	24.5	2	3
T90	Winton Avenue - D Street-WB	Foothill Boulevard/D St	Soto Rd	Hay	690	27.2	2	3
T91	Winton Avenue - D Street-WB	Soto Rd	Santa Clara St	Hay	2510	23.0	2	3
T92	Winton Avenue - D Street-WB	Santa Clara St	SB I-880 ON Ramp	Hay	1394	34.7	2	3
T93	Winton Avenue - D Street-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hay	4771	24.1	2	3
T94	A Street-EB	Foothill Boulevard/A St	Redwood Rd/Grove Way	Hay, Ala Cnty	4	23.6	2	3
T95	A Street-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Ala Cnty	4	18.5	2	3
T96	A Street-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Ala Cnty	4	28.8	2	3
T97	A Street-WB *	Redwood Rd/Grove Way	Foothill Boulevard/A St	Ala Cnty	4	15.8	2	3
T98	Hesperian Boulevard-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Uni Cty	4	26.5	1	2
T99	Hesperian Boulevard-Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Uni Cty	4	32.9	1	2
T100	Hesperian Boulevard-Union City Blvd-NB	Hesperian/Union City Blvd/overbridge	Industrial Blvd	Hay	4	26.4	1	2
T101	Hesperian Boulevard-Union City Blvd-NB	Industrial Blvd *	Tennyson/Hesperian	Hay	4	25.2	2	3
T102	Hesperian Boulevard-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Hay	4	26.8	2	3
T103	Hesperian Boulevard-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Hay	4	19.3	1	2
T104	Hesperian Boulevard-Union City Blvd-SB	Hesperian/Union City Blvd/overbridge	Whipple Rd	Uni Cty	4	22.1	1	2
T105	Hesperian Boulevard-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Uni Cty	4	29.5	1	2
T106	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Fre	904	30.6	1	2
T107	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Uni Cty, Fre	507	32.4	1	2
T108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Uni Cty	766	28.5	1	2
T109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Uni Cty	885	28.1	1	2
T110	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Uni Cty, Fre	753	31.2	1	2
T111	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Fre	1171	31.6	1	2

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T112	Fremont Boulevard-NB *	NB I-880 OFF Ramp	Automall Parkway	Fre	419	34.7	1	2
T113	Fremont Boulevard-NB *	Automall Parkway	Blacow Rd	Fre	863	34.2	1	2
T114	Fremont Boulevard-NB *	Blacow Rd	Adams Ave	Fre	3417	28.0	1	2
T115	Fremont Boulevard-NB *	Adams Ave	Stevenson Rd	Fre	1953	27.9	2	3
T116	Fremont Boulevard-NB *	Stevenson Rd	Mowry Ave	Fre	1080	30.2	2	3
T117	Fremont Boulevard-NB *	Mowry Ave	Peralta Blvd	Fre	1460	30.0	2	3
T118	Fremont Boulevard-NB *	Peralta Blvd	Thornton Ave	Fre	1012	30.9	2	3
T119	Fremont Boulevard-NB *	Thornton Ave	Decoto Rd	Fre	363	32.0	1	2
T120	Fremont Boulevard-NB *	Decoto Rd	Paseo Padre Pkwy	Fre	685	31.0	1	2
T121	Fremont Boulevard-NB *	Paseo Padre Pkwy	NB I-880 OFF Ramp	Fre	668	31.0	1	2
T122	Fremont Boulevard-SB *	NB I-880 OFF Ramp	Paseo Padre Pkwy	Fre	658	32.0	1	2
T123	Fremont Boulevard-SB *	Paseo Padre Pkwy	Decoto Rd	Fre	504	29.7	1	2
T124	Fremont Boulevard-SB *	Decoto Rd	Thornton Ave	Fre	504	30.2	1	2
T125	Fremont Boulevard-SB *	Thornton Ave	Peralta Blvd	Fre	1402	29.3	2	3
T126	Fremont Boulevard-SB *	Peralta Blvd	Mowry Ave	Fre	627	29.4	2	3
T127	Fremont Boulevard-SB *	Mowry Ave	Stevenson Rd	Fre	653	32.3	2	3
T128	Fremont Boulevard-SB *	Stevenson Rd	Adams Ave	Fre	1538	27.8	2	3
T129	Fremont Boulevard-SB *	Adams Ave	Blacow Rd	Fre	3592	27.9	1	2
T130	Fremont Boulevard-SB *	Blacow Rd	Automall Parkway	Fre	527	33.1	1	2
T131	Fremont Boulevard-SB *	Automall Parkway	NB I-880 OFF Ramp	Fre	370	34.9	1	2
T132	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fre	6	23.1	1	2
T133	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fre	6	29.5	1	2
T134	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fre	4	21.5	1	2
T135	Automall Parkway-WB *	Fremont Blvd	NB I-880 OFF Ramp	Fre	7	27.1	1	2
T136	Vasco Road-NB	WB I-580 OFF Ramp	Scenic Ave	Liv	2668	36.3	1	2
T137	Vasco Road-NB	Scenic Ave	Dalton Ave/City-County Line	Liv	3357	37.4	1	2
T138	Vasco Road-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Liv	4059	53.0	Rural	
T139	Vasco Road-NB	N. Vasco Rd/Vasco Rd	Local Road underpass/County Line	Liv	4059	53.0	Rural	

Appendix H. Free Flow Speed Surveys

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T140	Vasco Road-SB *	Local Road underpass/County Line	N. Vasco Rd/Vasco Rd	Liv	4024	46.8	Rural	
T141	Vasco Road-SB *	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Liv	4024	46.8	Rural	
T142	Vasco Road-SB	Dalton Ave/City-County Line	Scenic Ave	Liv	3796	34.3	1	2
T143	Vasco Road-SB	Scenic Ave	WB I-580 OFF Ramp	Liv	2832	32.0	1	2
T144	Dublin Blvd.-EB	San Ramon Road	Village Parkway	Dub	424	26.5	2	3
T145	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dub	1393	29.5	2	3
T146	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dub	1280	34.1	1	2
T147	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dub	540	30.2	1	2
T148	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dub	1922	29.1	1	2
T149	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dub	459	32.8	1	2
T150	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dub	2574	29.5	2	3
T151	Dublin Blvd.-WB	Village Parkway	San Ramon Road	Dub	891	24.5	2	3
T152	San Ramon Road-NB	WB I-580 OFF ramp	Silvergate Dr	Dub	684	30.8	1	2
T153	San Ramon Road-NB	Silvergate Dr	Alcosta Blvd/Westside Dr/County Line	Dub	1362	35.1	1	2
T154	San Ramon Road-SB	Alcosta Blvd/Westside Dr/County Line	Silvergate Dr	Dub	1664	35.8	1	2
T155	San Ramon Road-SB	Silvergate Dr	WB I-580 OFF ramp	Dub	509	32.7	1	2
T156	Dougherty Road-NB *	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dub	1809	35.4	1	2
T157	Dougherty Road-NB *	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dub	1987	44.1	1	2
T158	Dougherty Road-SB *	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dub	1915	43.1	1	2
T159	Dougherty Road-SB *	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dub	1404	33.1	1	2
T160	Tassajara Road-NB	WB I-580 OFF ramp	Central Parkway	Dub	4	24.7	1	2
T161	Tassajara Road-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dub	4	34.3	1	2
T162	Tassajara Road-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dub	4	38.4	1	2
T163	Tassajara Road-NB	Fallon Rd	County Line	Ala Cnty	4	35.2	1	1
T164	Tassajara Road-SB	County Line	Fallon Rd	Ala Cnty	4	45.2	1	1
T165	Tassajara Road-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dub	4	38.7	1	2
T166	Tassajara Road-SB *	Somerset Ln/N Dublin Ranch Dr	Central Parkway	Dub	4	33.8	1	2
T167	Tassajara Road-SB *	Central Parkway	WB I-580 OFF ramp	Dub	6	25.7	1	2

Table H-7: Free Flow Speed Results

#	Route	From	To	Jurisdiction	Sample Size	Average Speed	HCM Class	
							1985	2000
T168	E. Stanley Blvd - Railroad Avenue - 1st Street-NB *	SR 84/Isabel Ave	Murrita Blvd	Liv	6	31.5	1	2
T169	E. Stanley Blvd - Railroad Avenue - 1st Street-NB *	Murrita Blvd	S Livermore Ave	Liv	4	23.4	2	3
T170	E. Stanley Blvd - Railroad Avenue - 1st Street-NB *	S Livermore Ave	Inman St	Liv	4	21.7	2	3
T171	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Inman St	S Livermore Ave	Liv	4	20.1	2	3
T172	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	S Livermore Ave	Murrita Blvd	Liv	6	26.6	2	3
T173	E. Stanley Blvd - Railroad Avenue - 1st Street-SB	Murrita Blvd	SR 84/Isabel Ave	Liv	4	21.9	1	2
T174	Stoneridge Drive-EB	SB I-680 OFF Ramp	Hopyard Rd	Plea	2024	33.2	1	2
T175	Stoneridge Drive-EB	Hopyard Rd	Hacienda Dr	Plea	813	29.8	1	2
T176	Stoneridge Drive-EB	Hacienda Dr	W. Las Positas Blvd	Plea	640	31.1	1	2
T177	Stoneridge Drive-EB	W. Las Positas Blvd	Santa Rita Road	Plea	744	30.0	1	2
T178	Santa Rita Road-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Plea	2402	31.1	1	2
T179	Santa Rita Road-EB	W. Los Positas Blvd	WB I-580 OFF Ramp	Plea	2454	30.3	1	2
T180	Santa Rita Road-WB	WB I-580 OFF Ramp	W. Los Positas Blvd	Plea	1595	31.3	1	2
T181	Santa Rita Road-WB	W. Los Positas Blvd	Santa Rita Road	Plea	2590	31.5	1	2
T182	Stoneridge Drive-WB	Santa Rita Road	W. Las Positas Blvd	Plea	752	31.8	1	2
T183	Stoneridge Drive-WB	W. Las Positas Blvd	Hacienda Dr	Plea	879	33.8	1	2
T184	Stoneridge Drive-WB	Hacienda Dr	Hopyard Rd	Plea	894	28.8	1	2
T185	Stoneridge Drive-WB	Hopyard Rd	SB I-680 OFF Ramp	Plea	725	32.9	1	2
T186	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Plea	724	31.2	1	2
T187	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Plea	1788	26.1	3	4
T188	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Plea	728	32.1	2	3
T189	Sunol Blvd.- 1st Street- Stanley Blvd.-NB *	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Plea, Ala Cnty	1151	44.9	1	1
T190	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Plea, Ala Cnty	2634	51.0	1	1
T191	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Plea	1867	34.6	2	3
T192	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Plea	2574	25.4	3	4
T193	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave	NB I-680 OFF	Plea	1838	35.6	1	2

* Alameda CTC may refine HCM arterial class in 2016 LOS Monitoring Study as these segments were impacted by construction or performed slower in free flow surveys than in peak period.

