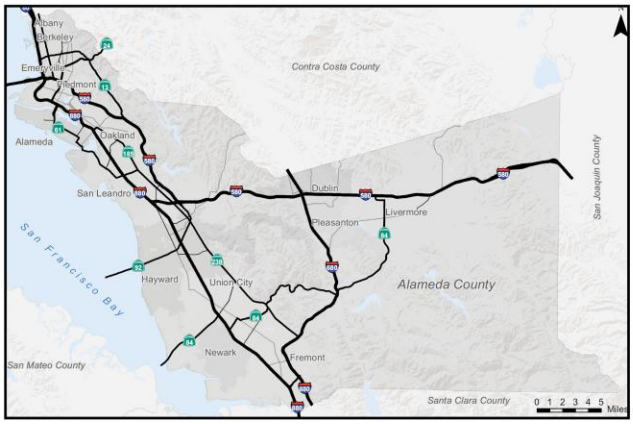

Alameda CTC

2012 Level of Service Monitoring Report

January 2013

ALAMEDA
County Transportation Commission

Alameda County Transportation Commission
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2012
LEVEL OF SERVICE MONITORING

ON THE CONGESTION MANAGEMENT PROGRAM ROADWAY NETWORK

ALAMEDA COUNTY TRANSPORTATION COMMISSION

January 2013

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EXECUTIVE SUMMARY

CONGESTION MANAGEMENT PROGRAM LEGISLATION AND LOS MONITORING

The Congestion Management Program (Program) statute, passed by the California State Legislature in 1990, requires that all elements of the Program[ES-1] be monitored at least biennially by the designated Congestion Management Agency (CMA) [ES-2]. The Alameda County Transportation Commission, as the designated CMA for Alameda County, is responsible for the development of the Alameda County Congestion Management Program (CMP) which requires establishment of Level of Service (LOS) standards and biennial monitoring during even-numbered years of the Alameda County CMP designated roadway system ("CMP network"). The CMP network (see Figure 1 in Chapter 1, Introduction) includes all of the major freeways, selected ramps and special segments, arterials, and major collector roadways in Alameda County.

The objectives of this LOS monitoring effort are to determine average travel speeds and existing LOS on Alameda County roadways, identify congested roadway segments (operating at LOS F or stop-and-go traffic), and identify long-term trends in traffic congestion on the CMP network.

This report provides the background for the Alameda County LOS Monitoring Program (Chapter 1, Introduction), highlights the results from the 2012 monitoring study and compares them with the 2010 monitoring results (Chapter 2, Level of Service Results and Chapter 3, Travel Time Studies for Origin-Destination Pairs) , provides a long-term trend analysis using data collected over the years (Chapter 4, Trend Analysis), and identifies projects and studies that could either potentially improve or identify ways to improve the congested roadway segments (Chapter 5, Monitoring Results and Next Steps).

ALAMEDA COUNTY LOS MONITORING PROGRAM

Level of service on the Alameda County CMP network has been monitored since 1991. While the network was monitored every year initially, monitoring has been conducted biennially since 1998. Monitoring is done by collecting travel-time data on the CMP network. This travel-time data combined with the length of the roadways are used to estimate speeds on the respective roadways. The estimated speed is used to assess how well the roadways are performing.

[ES-1] The five elements of the Congestion Management Program include: Level of Service Standards, Performance Element, Travel Demand Element, Land Use Analysis Program, and Capital Improvement Program.
[ES-2] The most recent Alameda County Congestion Management Program (CMP) was adopted by the Alameda County Transportation Commission on December 1, 2011. The original CMP was adopted on October 24, 1991.

The CMP Network

The CMP network consists of the Tier 1 and Tier 2 roadways as shown in Figure 1 (see Tables 1 and 2 for data) in Chapter 1, Introduction. The distinction is that only Tier 1 is used for CMP Conformity purposes.

The Tier 1 network, adopted in 1991 (with an exception of a 2.5 mile segment of Hegenberger Road in Oakland), has years of data collected for this effort and includes the following:

- Approximately 232 miles of roadways and 22 freeway-to-freeway ramps and special segments (see Table 1, in Chapter 1, Introduction).
  - Freeways – 134 miles
  - State highways – 71 miles
  - Principal arterials – 27 miles
  - Freeway-to-freeway ramps and special segments – 22

The Tier 2 network, in contrast, was added more recently to the 2011 update of the CMP network. It includes:

- Approximately 90[ES-3] miles of additional principal arterials and major collectors (see Table 2, in Chapter 1, Introduction)

All CMP roadways are split into several segments each with uniform characteristics for the purposes of travel-time data collection and speed estimation.

LOS Standards

The CMP statute requires that a level of service standard be established for the CMP network. The Alameda County LOS Monitoring Study follows the LOS speed standards based on the 1985 Highway Capacity Manual.[ES-4] Based on these standards, the level of service is assigned ranging from A (the best or free-flow traffic) to F (the poorest or stop-and-go traffic) for the roadways, using the estimated speeds from the following travel-time data collected:

LOS A: Free traffic flow
LOS B: Stable traffic flow
LOS C: Stable traffic flow with restricted speed
LOS D: Approaching unstable flow
LOS E: Unstable traffic flow
LOS F: Stop-and-go traffic

The required minimum level of service (to meet the level of service standard) for the CMP roadways is LOS E. An exception to this LOS E standard is made for roadways that operated at LOS F during the original surveys when the 1991 "baseline" conditions were established. These roadways are "grandfathered" in at LOS F.

Except for grandfathered segments, when a CMP roadway is congested and fails to meet this standard, a deficiency plan is required to be prepared by the member agency that identifies:

- the cause of the deficiency
- measures to improve the performance of the roadway
- a funding plan for the proposed improvements

The conformance with the level of service standard is assessed biennially during the LOS monitoring years, and conformance on the progress of the adopted deficiency plans is assessed annually. A member agency's state gas tax subventions may be withheld if said agency does not maintain the LOS standard or have an approved deficiency plan for roadways that fall below the LOS standard.

For the CMP Conformity purposes, only travel time data collected on the Tier 1 network during the p.m. peak period is used. All other data collected are used for informational purposes.

[ES-3] In the 2011 CMP Update, the total length of the Tier 2 roadways was estimated to be 92 miles. However, as measured on the ground in 2012, the correct total length of the Tier 2 network is 89.8 miles.

[ES-4] As part of the 2013 CMP Update, the 2010 Highway Capacity Manual standards will be considered to be used for LOS Monitoring purposes.

SUMMARY OF 2012 LOS MONITORING RESULTS

Based on the 2012 monitoring results, overall speeds on county roadways have declined slightly since 2010 while speeds improved in a few areas.

The decline in overall speeds is likely due to the effects of the recovering economy combined with construction activities across the county.

- Data from the Bureau of Labor Statistics (September 2012) show statewide employment improved, adding 500,000 jobs between January 2010 and July 2012.
- Notable construction activities on major roadways that likely created congestion:
  - Bay Bridge (east span construction)
  - I-880/5th Avenue (retrofit)
  - I-880/High Street (retrofit)
  - SR 238 / Foothill Boulevard (operational improvements)
  - Caldecott Tunnel (4th bore construction)
  - Hegenberger Road (Oakland Airport Connector)

Improvements observed appear to be the result of the completion of transportation projects since Spring 2010 when the CMP network was last monitored.

- Projects completed since Spring 2010:
  - I-880/SR 92 improvements
  - Eastbound I-580 HOV Lane construction in east county
  - Southbound I-680 Express Lane opening

The 2012 LOS results also showed three new bottlenecks on the CMP network.

Chapter 2, Level of Service Results, describes the 2012 LOS results for the entire CMP network for all time periods. The LOS Monitoring also includes travel-time surveys between selected origin-destination (O-D) for various modes and the three Bay Bridge Crossings. The results are described in Chapter 3, Travel Time Studies of O-D pairs.

Overall Average Speed

The overall system-wide speed for the county freeways and arterials are shown in Table ES-1 below. Data were collected for the first time in 2012 for the Tier 2 arterials and freeways during the weekend peak period.

Table ES-1: Average Vehicle Speeds during Peak Periods on Alameda County CMP Roadways (in mph)

		2010 Results	2012 Results
Tier 1	Freeways p.m.	51.8	50.9
	Arterials p.m.	26.1	25.1
	Freeways a.m.	53.4	52.5
	Arterials a.m.	28.0	26.5
	Freeways–Weekend 1-3 p.m.	-	62.2
Tier 2	Arterials p.m.	-	25.1
	Freeways a.m.	-	24.9

Based on an average of the speeds on all CMP roads in the county, the overall average speeds decreased systemwide on freeways and arterials. This occurred during both p.m. and a.m. peak periods with decreases ranging between 0.9 to 1.5 mph. The highest decline of 1.5 mph occurred on arterials during the a.m. peak period.

LOS F Segments

The CMP roadway segments that performed at LOS F in 2012 are shown in Figure 2, Chapter 1, Introduction. An increased number of LOS F segments were observed between 2012 and 2010. During the p.m. peak period in 2012, there were 39 LOS F segments reported in comparison with 35 such segments in 2010. Similarly, during the a.m. peak period in 2012, there were 27 segments operated at LOS F in comparison with 19 in 2010.

Additionally, the total number of improved segments from the previous monitoring cycle decreased from 19 in 2010 to 15 in 2012.

OBSERVED LONG-TERM TRENDS

Based on the data collected since 1991 for the LOS Monitoring studies, trends in Alameda County roadway performance have been observed using two measures: vehicle hours of delay and average speeds on the CMP network. Vehicle hours of delay have been reported since 2008 while average speeds on the CMP network have been reported since 1991.

Vehicle Hours of Delay

Since 2008, vehicle hours of delay (VHD) for the LOS F freeway segments were reported to highlight the estimated delay due to the congestion on county freeways. This estimation captures the core delay occurring on the CMP freeways during the 2-hour peak period when the CMP network is monitored.

The VHD for the p.m. peak period on the LOS F freeway segments since 2008 shows a reduction of 3,544 from 2010, with a delay of 12,190 in 2012 compared to 15,734 in 2010. Two projects likely contributed to this decrease: I-880/SR 92 improvements and eastbound I-580 HOV lanes. These projects were under construction in 2010 but were completed when 2012 monitoring was performed (see Chart 1, Chapter 4).

The estimated total VHD on the LOS F freeway segments during the a.m. peak period increased from 9,894 hours in 2010 to 12,681 hours in 2012 (see Chart 2, Chapter 4). This trend is consistent with the general decreased speed experienced on the roadway system in 2012 compared with 2010.

Average Speeds on the CMP Network and Relationship to Jobs and Vehicle Miles Traveled

Average speeds during the p.m. peak period for the Tier 1 freeways and arterials have been reported since 1991. Comparative analyses were performed using the average speeds over time and other external factors such as unemployment (indicator for jobs) that would impact the volume of traffic on the roadways and vehicle miles traveled (vehicle throughput). The intent of the analysis was to see how the roadways are performing during the fluctuations of the economy and the volume of traffic the network handled over time as well as to measure the effectiveness of the congestion management activities (projects and programs) implemented on the county roadways. Charts 3-5 in Chapter 4 illustrate the relationship between the trends in average speeds and employment and vehicle miles travelled.

Notable findings:

- There is a positive relationship observed between freeway speeds and the unemployment. When unemployment increases, indicating fewer jobs, freeway speed increases.
- No relationship appears to be exist between arterials speed and unemployment, indicating the need to study arterials to better understand their performance.
- The speeds on the CMP roadways have been relatively stable since 1996 as changes have been within 10 percentage points, while the volume of vehicles traveling in the network increased about 20%, which could be the result of various congestion management activities undertaken in the county through planning and implementation of various programs and projects.

PLANNED IMPROVEMENTS RELATED TO THE CONGESTED ROADWAYS AND NEXT STEPS

The congested (LOS F) roadway segments reported in the 2012 Monitoring cycle were reviewed to identify whether any projects that are underway or planned could improve the performance of those segments upon completion. In addition, studies

underway or planned were also investigated. New bottlenecks where no improvements were planned were identified for further study. Based on the analysis, the congested segments were grouped into three categories (see Table 7 in Chapter 5. Monitoring Program Results and Next Steps):

- Construction Underway or Competed Recently
- In Project Development Phase/Programmed/Planned/Being Studied
- To be investigated

Two of the three new bottlenecks reported in 2012 monitoring cycle, where no projects or studies were planned, were identified for further studies.

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1. INTRODUCTION

The Alameda County Transportation Commission (Alameda CTC), a Joint Powers Authority, is a newly formed countywide transportation agency, resulting from the July 2010 merger of the Alameda County Congestion Management Agency (ACCMA) and the Alameda County Transportation Improvement Authority (ACTIA). For more than two decades, ACTIA and the ACCMA collectively spearheaded transportation programs and projects in Alameda County. In assuming the duties of the ACCMA, the Alameda CTC is the Congestion Management Agency for Alameda County and will continue to perform congestion management activities.

The Congestion Management Program statute, requires designation of a system ('CMP network') of highways and roadways including all freeways, state highways and principal arterials. The statue also requires that a level of service standard be established to measure congestion on the CMP network, and the network be monitored at least biennially. Alameda CTC, as the designated CMA for Alameda County, has established the Alameda County CMP network and adopted Level of Service (LOS) standards. Alameda CTC monitors the network biennially in even numbered years.

The objectives of this monitoring effort are:

- to determine the average travel speeds and existing LOS throughout Alameda County
- to identify those roadway segments in the County that are operating at LOS F
- to identify long-term trends in traffic congestion on the CMP network

THE CMP NETWORK

The Alameda County CMP network was initially adopted in 1991 and consisted of approximately 232 miles of roadways. Of this total, 134 miles are freeways, 71 miles are conventional state highways, and 27 miles are City/County arterials. Additionally, in 1992, 22 major freeway-to-freeway and freeway-to-state route connectors were added to the network. The same network with the exception of three minor changes was used for monitoring purposes until the 2010 monitoring cycle.

Since the adoption of the CMP network in 1991, land use and traffic patterns across the county have changed significantly. However, the CMP network was not expanded to be reflective of these changes, with the exceptions of a two-mile segment of Hegenberger Road in Oakland and changes due to the realignment of SR 84 in East County. Therefore, in view of the need for measuring performance of the larger road network where the majority of the travel occurs in the county, the Commission, as part of the 2011 CMP Update, expanded the CMP network by adding approximately 90 miles of additional principal arterials and major collectors across the county using a set of adopted qualitative criteria. With this expansion of the CMP network, a two-tier CMP roadway system was created with Tier 1 being the existing CMP network and Tier 2 being the newly added 90 miles of roadways.

The full list of routes for Tiers 1 and 2, summarized by jurisdiction, is shown in Tables 1 and 2 respectively. The entire CMP network (Tiers 1 and 2) is shown in Figure 1. Of the fifteen jurisdictions, Piedmont is the only city in Alameda County that does not have any roadways that are part of the CMP network. Starting in the 2012 LOS Monitoring cycle, travel-time data was collected for both Tiers 1 and 2 roadways.

Table 1: Tier 1—Alameda County CMP Designated Roadway Network[1] Routes and Estimated Mileage by Jurisdiction

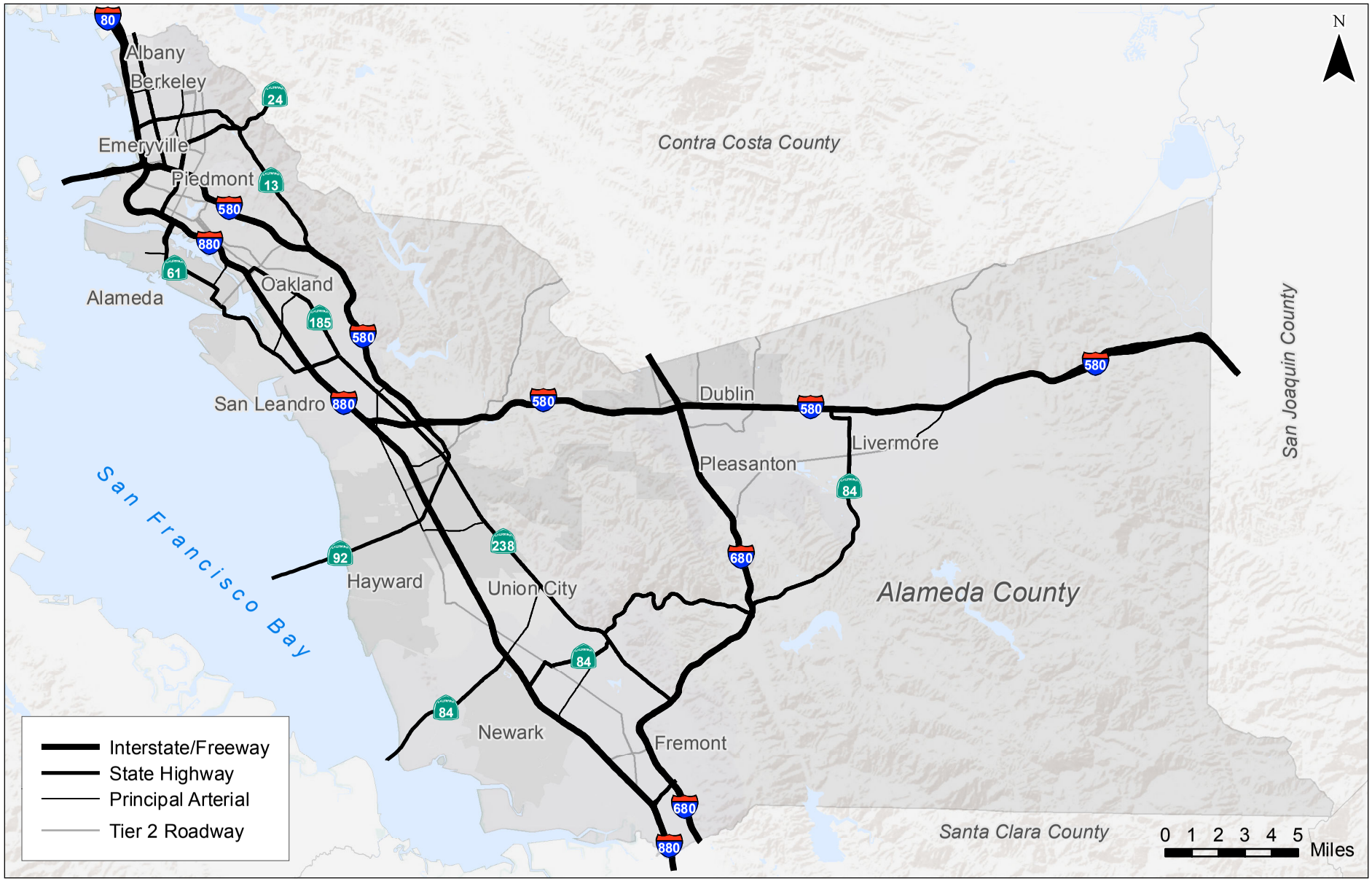
Jurisdiction	Freeway	Miles	Other State Highways	Miles	Other Arterials	Miles
Albany	I-80 I-580	0.61 0.92	SR 123 (San Pablo Ave.)	1.22	None	—
Berkeley	I-80	3.14	SR 123 (San Pablo Ave.) SR 13 (Ashby/Tunnel Rd.)	2.36 3.87	University Ave. Shattuck Ave. MLK Jr. Blvd. Adeline	2.04 1.84
Emeryville	I-80	1.31	SR 123 (San Pablo Ave.)	0.68	None	—
Oakland	I-80 I-880 I-980 I-580 SR 24 SR 13	4.09 7.66 2.30 11.28 4.50 5.43	SR 123 (San Pablo Ave.) SR 13 (Tunnel Rd.) SR 61/260 (Tubes) SR 61 (Doolittle Dr.) SR 77 (42nd Ave.) SR 185 (E 14th St.)	1.19 0.10 0.66 2.39 0.31 3.98	MLK Jr. Blvd. Hegenberger Rd. 29th Ave./23rd Ave. -(See Park St-Alameda)	0.89 2.52 0.85
Piedmont	None	—	None	—	None	—
Alameda	None	—	SR 61 (Doolittle Dr., Otis, Webster St) SR 61/260 (Tubes)	4.47 0.65	Atlantic Ave. Park St.	0.80 0.55
San Leandro	I-880 I-580	3.78 2.95	SR 61 (Doolittle Dr.) SR 61/112 (Davis St.) SR 185 (E 14th St.)	0.70 1.78 3.16	150th Ave. Hesperian Blvd.	0.49 0.97
Hayward	I-880 SR 92	4.23 6.36	SR 185 (Mission Blvd.) SR 238 (Mission Blvd.) SR 238 (Foothill Blvd.) SR 92 (Jackson St.)	0.85 3.29 1.50 1.58	A St. Hesperian Blvd. Tennyson Rd.	1.61 2.60 2.32
Union City	I-880	1.70	SR 238 (Mission Blvd.)	2.57	Decoto Rd.	1.76
Fremont	I-680 I-880 SR 84	6.20 11.96 3.17	SR 238 (Mission Blvd.) SR 262 (Mission Blvd.) SR 84 (Thornton, Fremont, Mowry Ave.)	5.03 1.22 10.99	Decoto Rd. Mowry Ave.	1.15 2.96
Newark	SR 84	1.99	None	—	None	—
Pleasanton	I-580 I-680	4.65 5.26	None	—	None	—
Livermore	I-580	4.61	SR 84	5.29	1st Street	1.66
Dublin	I-680	1.84	None	—	None	—
Unincorporated Areas	I-680 I-580 I-238 I-880	7.91 22.50 1.99 1.93	SR 84 (Vallecitos Rd.) SR 185 (Mission Blvd & E 14th) SR 238 (Foothill Blvd.)	7.97 2.47 0.79	Hesperian Blvd.	1.99
Totals		**134 mi**		**71 mi**		**27 mi**

[1] As adopted in October 24, 1991 (except for the re-aligned SR 84 and 1st Street in Livermore, which were changed in 2004 and 2006 studies, respectively; and Hegenberger Road between I-880 and Doolittle Drive in Oakland, which was added in the 2008 study).

Table 2: Tier 2—Alameda County CMP Designated Network** Routes and Estimated Mileage by Jurisdiction

Jurisdiction	Distance (miles)	Route
Alameda County	0.9	A Street*
	7.0	Crow Canyon Road
	2.7	Sunol Blvd.–1st Street–Stanley Blvd.*
	1.0	Grove Way
Alameda	1.2	High Street
Berkeley	0.7	Bancroft
	1.4	College Avenue*
	0.5	Shattuck Avenue*
	1.4	Telegraph Avenue*
	0.8	Powell Street–Stanford Avenue
Dublin	1.9	Dougherty Road
	3.6	Dublin Blvd.
	1.7	San Ramon Road
	2.8	Tassajara Road
Emeryville	1.5	40th Street–Shellmound Avenue
	0.6	Powell Street–Stanford Avenue
Fremont	1.6	Automall Parkway
	8.8	Fremont Boulevard
Hayward	0.3	A Street*
	1.6	Hesperian Boulevard–Union City Blvd.*
	2.2	Winton Avenue–D Street
Livermore	4.2	E. Stanley Blvd–Railroad Avenue–1st Street
	5.7	Vasco Road
Oakland	2.4	12th Street–Lakeshore Avenue
	0.8	51st Street
	3.1	Broadway
	1.0	College Avenue*
	1.0	E. 15th Street
	5.3	Foothill Boulevard
	2.3	High Street
	2.9	International Boulevard
	0.8	Powell Street–Stanford Avenue
	1.0	Shattuck Avenue*
	0.8	Telegraph Avenue*
	3.1	W. Grand Avenue to Grand Avenue
	1.1	73rd Avenue
Pleasanton	1.2	Santa Rita Road
	2.5	Stoneridge Drive
	2.9	Sunol Blvd.–1st Street–Stanley Blvd.*
Union City	2.2	Alvarado Blvd.
	1.3	Hesperian Boulevard–Union City Blvd.*
TOTAL	**89.8**	

* Denotes that roadway traverses more than one jurisdiction.
**As adopted by Alameda CTC in December 2011.



ALAMEDA County Transportation Commission

Alameda County CMP System

Figure 1

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KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

LEVEL OF SERVICE STANDARDS AND CMP CONFORMITY

LOS definitions generally describe traffic conditions in terms of speed and travel time, volume and capacity, freedom to maneuver, traffic interruptions, comfort and convenience and safety. LOS is represented by letter designations, ranging from A to F, with LOS A representing the best operating conditions and LOS F the worst. The level of service standard for CMP monitoring purposes is LOS E.

- Levels of Service A, B and C indicate conditions where traffic can move relatively freely.
- Level of Service D describes conditions where delay is more noticeable.
- Level of Service E describes conditions where traffic volumes are at or close to capacity, resulting in significant delays and unstable traffic flow.
- Level of Service F characterizes conditions where traffic demand exceeds the available capacity, with very slow speeds (stop-and-go), long delays (over one minute at intersections), and average speeds of less than half of the uncongested or free flow speed.

Each year, member agencies must demonstrate that all CMP roadway systems within their jurisdictions are operating at or above the CMP traffic LOS standard. A member agency's state gas tax subventions may be withheld if the member agency does not maintain the traffic LOS standard or have an approved deficiency plan for roadways that fall below the LOS standard. The deficiency plan should identify:

- the cause of the deficiency;
- measures to improve the performance of the roadway; and
- a funding plan for the proposed improvements.

An exception to this requirement is made for roadways that operated at LOS F in the 1991 "baseline" conditions. These roadways were "grandfathered" in at LOS F.

Monitoring for Conformance and Information

Until 2010, travel-time data was collected during the p.m. (4:00 to 6:00) and a.m. (7:00 to 9:00) peak periods on the Tier 1 network. Beginning in 2012, data had also been collected on the freeways during weekend peak period (1:00 to 3:00 p.m.) and on the Tier 2 network during both a.m. and p.m. peak periods. For CMP Conformity (identifying whether a CMP segment meets the LOS standard, and if not, whether a deficiency plan is required to be prepared) purpose, only data collected on the Tier 1 network during p.m. peak period is used. All other data collected on the Tier 1 (a.m. and weekend peak periods) and on Tier 2 (a.m. and p.m.) networks including any additional data are used for informational purposes only.

In addition to the travel-time data collection on the CMP network, travel-time surveys are also conducted for auto, transit, bicycle and HOV lane trips between selected Origin-Destination (O-D) pairs. These O-D pairs have been selected as either major employment centers or residential areas to simulate typical commute trips on the County's major corridors and to evaluate the comparative performance of various transportation modes between these pairs. Travel times on the three Bay bridge crossings (i.e., Bay Bridge, San Mateo Bridge and Dumbarton Bridge) that connect Alameda County to San Francisco and San Mateo Counties have also been reported since 2002.

Table 3 shows data collection time periods and the purpose for which the data is used.

Table 3: CMP Network Monitoring Periods and Purpose of Monitoring

		Monitoring Purpose: Conformity	Monitoring Purpose: Informational
Tier 1	Freeways p.m.	X	
	Arterials p.m.	X	
	Ramps and Special Segments p.m.	X	
	Freeways–Weekend 1-3 p.m.		X
	Freeways a.m.		X
	Arterials a.m.		X
	Ramps and Special Segments a.m.		X
Tier 2	Arterials p.m.		X
	Freeways a.m.		X

STUDY METHODOLOGY

The Alameda County CMP established that measurement of LOS be based on average travel speed, consistent with the method described in the *Manual of Traffic Engineering Studies*[2]. The study methodology involves: establishing roadway segment boundaries; collecting travel-time data; computing travel speeds; and comparing average speeds with LOS speed ranges as specified in the 1985 Highway Capacity Manual[3]. For this study, the "floating car" method was used to record travel times through the Global Positioning System (GPS) between roadway segments.

CMP Roadway Segments

Tiers 1 and 2 roadways were divided into approximately 372 segments for Tier 1 and 196 segments for Tier 2 for this study, using the methodology described below for the different roadway classifications. The number of segments increased from 296 in 2006 to 372 in 2008 for Tier 1 roadways due to the segmentation of longer CMP network segments into shorter segments.

Freeways—Tier 1

The 134 miles freeways on the CMP network consist of 150 segments for monitoring purposes. When CMP roadway segments were developed in 1991, major interchanges were used as segment boundaries for freeways. Along more heavily traveled sections, segments generally span from one to three interchanges. Where traffic volumes entering and exiting the freeway were minor, three or more sections were combined into longer segments. This was the case, for instance, in the eastern section of the I-580 corridor. However, over the last two decades the land use and traffic patterns have changed in places such as East County as a result of housing and job growth, creating the need to split longer CMP segments into shorter segments. This exercise was carried out as a trial in the 2006 LOS Monitoring Study. It was subsequently refined and adopted in the 2007 CMP. As of the 2008 monitoring cycle, the LOS Monitoring Study uses the shorter segments.

Arterials—Tier 1

Tier 1 Arterials include 232 segments covering 98 miles. For arterials, break points between segments generally occur at:

- jurisdiction boundaries
- points where the number of travel lanes change
- major arterial street crossings; and at 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. Nevertheless, 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, classification of arterials was developed for determining level of service. 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

[2] Paul C. Box and Joseph C. Oppenlander, *Manual of Traffic Engineering Studies,* 4th ed. (Arlington VA.: Institute of Transportation Engineers, 1976).

[3] As part of the 2013 CMP Update, the 2010 Highway Capacity Manual standards will be considered to be used for LOS Monitoring purposes.

Capacity Manual (Chapter 11, pp. 11-1 to 11-4)[4].

In 2006, similar to the split of freeway CMP network segments into shorter segments, a few arterial roadway segments were also split. These shorter arterial segments were used starting in the 2008 LOS Monitoring Study.

Arterials—Tier 2

The segmentation of Tier 2 Arterials was developed similar to Tier 1 Arterials.

To develop the arterial classification for the Tier 2 Arterials, free flow speed data is required. It is anticipated to be collected during or prior to the 2014 LOS Monitoring cycle. The 2010 Highway Capacity Manual will also be used for developing the classification of Tier 2 Arterials. Therefore, only the speed data that is reported for Tier 2 Arterials is included in the 2012 LOS Monitoring Study report.

Ramps and Special Segments—Tier 1

Separate travel time/speed runs are conducted for the ramps at freeway-to-freeway interchanges, since these connections can frequently have very different characteristics than the freeways themselves. There are 22 freeway-to-freeway ramps and special connectors that have been studied since 1992:

1. I-80 to I-580 connections (Oakland-Emeryville area)
2. I-580 to SR 24 connections (Oakland)
3. SR 13 to SR 24 connections (in the vicinity of the Caldecott Tunnel, Oakland)
4. I-880 to I-238 connections (San Leandro)
5. I-238 to I-580 connections (Hayward)
6. I-580 to I-680 connections (Pleasanton)
7. I-880 to SR 260 connections (at the Alameda tubes, Oakland)

[4] Highway Capacity Manual, Special Report 209, a publication of the Transportation Research Board, Washington D.C., 1985.

LEVEL OF SERVICE SPEED STANDARDS

Freeways and Arterials

This study uses the LOS speed standards shown in Table 4 for arterials and freeways based on the 1985 Highway Capacity Manual[5].

Non-Standard Roadways

The standards for other more unique types of roadway segments are described below.

Table 4: Relationship Between Average Travel Speed and Level of Service

Freeway Levels of Service[6]

LOS	Density (pc/mi/ln)[7]	Speed (mph)	Volume/ Capacity Ratio	Maximum Service Flow (pcphpl)[8]
A	≤ 12	≥ 60	0.35	700
B	≤ 20	≥ 55	0.58	1,000
C	≤ 30	≥ 49	0.75	1,500
D	≤ 42	≥ 41	0.90	1,800
E	≤ 67	≥ 30	1.00	2,000
F	> 67	< 30	—[9]	—

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

Arterial Levels of Service[11]

Arterial Class	I	II	III
Range of Free Flow Speeds (mph)	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	40	33	27

LOS	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

[5] See footnote #3.
[6] Adapted from Table 4-1, Special Report 209, Highway Capacity Manual; 1985.
[7] Passenger cars per mile per lane.
[8] Maximum service flow under ideal conditions, expressed as passenger cars per hour per lane.
[9] Highly variable, unstable flow; V/C Ratio is not applicable.
[10] Approved by Alameda CTC on June 14, 2004 to show degrees of LOS F on congested roadways.
[11] Table 12-1, Special Report 209, Highway Capacity Manual, 1985. For Rural Roadways, refer to Table 8-1 in the Highway Capacity Manual.

Rural Roadways

Few of the CMP routes are rural roadways (mostly located in East County), which require a special analysis procedure. On these roadways, traffic and speed characteristics are fairly uniform. Variations in speed are a function of roadway curvature and the presence of slow trucks in the traffic stream. Based on suggested guidelines from the Highway Capacity Manual, 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 percent of the free flow speeds. Levels of Service B to E are calculated at even intervals between free flow speeds and LOS F speeds.

One such roadway is SR 84 between the southern city limit of Livermore and Mission Boulevard in Fremont. More rural roadways are expected to be identified in the Tier 2 Arterials located in East County when the Arterial classification is developed.

For the SR 84 rural roadway portion, initial free flow speeds were determined based on special studies conducted in the 1992 surveys during off-peak, low-volume conditions to document the free flow speed. Considering the change in land use pattern combined with the roadway improvements made since 1992, new free flow surveys were conducted during the 2010 monitoring cycle. These speeds have been used to determine the levels of service since 2010.

Freeway-to-Freeway and State Route-to-Freeway Ramps

The guidelines for establishing LOS for these ramp connections were similar to those used for rural highways. Special studies were previously conducted as a part of the 1992 studies, during off-peak low-volume conditions, to document free flow speeds.

DATA COLLECTION

Travel-time data is typically collected for all segments on the CMP network during spring before the start of summer break from the schools to capture peak representative traffic conditions. Travel-time runs are made during the afternoon peak hours of 4:00 to 6:00 p.m. and the morning peak hours of 7:00 to 9:00 a.m. Consistent with the CMP guidelines, all runs are made on a Tuesday, Wednesday, or Thursday of a five-day work week. For 2012, data was collected from the second week of March 2012 through June 13, 2012.

The travel-time runs were spread evenly throughout the two-hour period. For each travel-time run, both the actual clock time and the location of the car were recorded using a GPS device. The travel times between checkpoints (i.e., segment limits) were then computed as the difference between the two corresponding clock times.

For the majority of the CMP system, at least six runs were made on each roadway segment. More than six runs were made on some Levels of Service E and F segments where heavy congestion has been previously reported or where a greater range of fluctuation in travel speed was found, or where questionable data was reported. On certain routes where free flow conditions of LOS C or better were experienced and where this data was consistent with previous reports, the studies were sometimes concluded after four runs were completed. The number of runs that were conducted on each route and the times and dates of the runs are available for review at the Alameda CTC.

Data Collection on the CMP Network and Other Surveys Since 1991

The study of p.m. peak period travel times has been conducted on the CMP network continuously since 1991. In 1994, the study was expanded to include a.m. peak period runs on selected arterials and freeways that were considered to be the most critical during the morning commute period. Starting in 2006, all of the CMP roadway segments are monitored in both a.m. and p.m. peak periods. In 2012, based on the directions from the Commission, travel-time data was also collected on the freeways during the weekend peak period between 1 p.m. and 3 p.m.

In addition, in 1996, the comparative travel times between auto and transit, and in one case bicycle, was also included for five selected origin-destination (O-D) pairs that reflect typical work trips in Alameda County. Over the years, additional O-D pairs were added, resulting in 10 home-work pairs being studied since 2006. In 2002, three pairs were added representing the three Bay Bridges Crossings that connect to Alameda County.

Construction Activities in 2012

Some CMP roadway segments were under construction during the 2012 study period, and the travel time/speed data on these routes could be considerably different than normal average traffic conditions. When the travel-time runs were conducted (March-June, 2012), the major projects under construction were:

- Bay Bridge
- I-880/5th Avenue Retrofit
- I-880/High Street Retrofit
- Caldecott Tunnel 4th Bore Project
- Oakland Airport Connector
- SR 238/ Foothill Boulevard Operational Improvements

At several locations, there may have been construction occurring along the edge of the roadway, but it was judged that the construction did not have a significant impact on the travel time results.

DATA ANALYSIS PROCEDURES

The travel speeds have been determined using measured times and distances between the checkpoints. The section-by-section and run-by-run travel time and speed data were checked for errors and abnormal results. Mathematically, the average travel time for a segment was computed as the sum of the average travel times of the individual sections comprising the segment. The average travel speed has been determined by dividing the average travel time for the segment into the segment length.

The LOS results represent the average travel speed during the two-hour peak periods on an average weekday. For many roadway segments, the range of measured speeds is very constant throughout the two-hour period. For others, speeds within this period can be quite different, especially when the peak congestion lasts for less than two hours.

For arterials, the travel-time results are closely related to (1) traffic signal timing and (2) the vehicle location in the traffic platoon during the study. In analyzing the data, if a travel-time run was made at the very beginning of the two-hour period, or toward the end of the period, and the data point was significantly different than other runs, this data point was discarded. Additional travel-time runs were then made during the time period when traffic congestion was more severe.

Some special conditions exist on freeway segments in the vicinity of major off-ramps. There may be different speeds in each lane of the freeway if the rightmost lanes are affected by congestion in the off-ramp. At some of the freeway-to-freeway interchanges on the CMP network, drivers may experience a different LOS in the rightmost lane or on the ramp connection than on the freeway itself. However, no separate travel time/speed runs were made for the rightmost lanes of the freeways approaching ramps.

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2. LEVEL OF SERVICE RESULTS

This section of the report describes the summary results of the surveys of the entire CMP network segments (freeway, arterial and ramp-to-ramp segments) for all time periods. Segments that are operating at LOS F (Appendices A1 and A2) and segments that have changed significantly since the 2010 survey are highlighted.

Figures 3 through 10 (Appendix B) show the results of the a.m. and p.m. peak travel-time runs and the resulting LOS for each of the segments on the CMP designated system by roadway. These figures each portray a sub-area of the county, which generally corresponds to the county planning areas. Weekend peak travel-time runs are shown in Figure 11 (Appendix B) on a countywide map.

The full listing of speed and level of service results for all CMP network segments is in Appendix G. In addition to the speed and LOS results for 2012 presented in this appendix, each entry also shows the results of the previous study (2010) to provide a comparison. Since the p.m. peak period data is used for conformity, generally p.m. peak period data is presented first followed by data from the a.m. peak period. The data are subdivided by tiers first, followed by data collection time period and type of roadway.

LOS F SEGMENTS

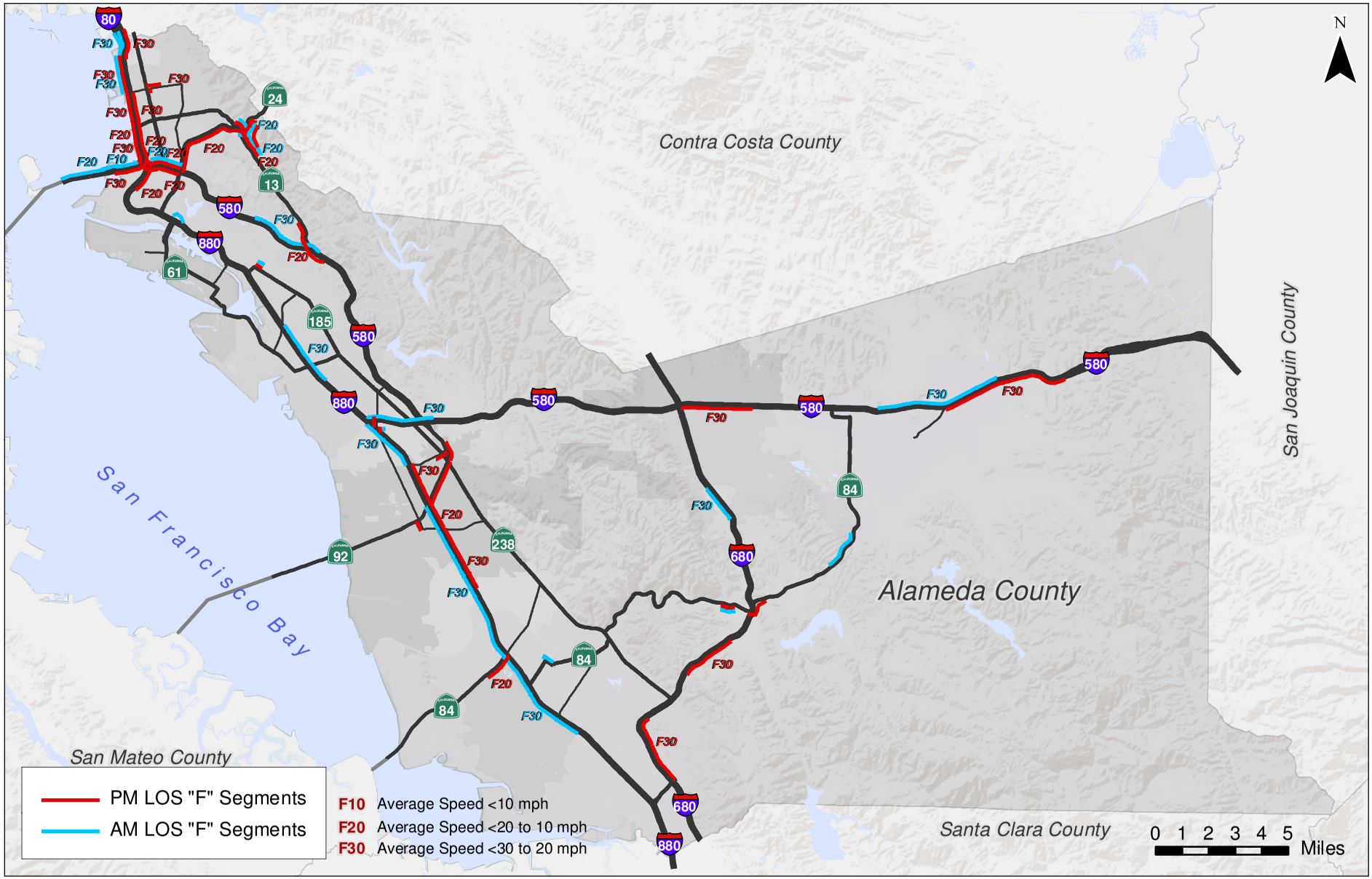
The 2012 monitoring results reported an increased number of LOS F segments and fewer improved LOS F Segments from the prior cycle compared to the 2010 results.

LOS F Segments in 2012

The 2012 surveys revealed that 39 segments were operating at Level of Service F during the p.m. peak period and 27 segments operated at LOS F during the a.m. peak period:

LOS F during the p.m. peak period..... 39
Freeway segments..... 27
Arterial segments..... 11
Ramps and special segments 1

LOS F during the a.m. peak period..... 27
Freeway segments.....21
Arterial segments..... 5
Ramps and special segments 1



ALAMEDA County Transportation Commission

2012 AM and PM Peak Period Level of Service "F" Results Countywide

Figure 2

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\02_2012 AM and PM Peak Period LOS F Results.mxd - ddepencier - 8:42 AM 7/16/2012

The number of segments operating at LOS F has increased from 2010 by four in the p.m. and eight in the a.m. peak periods. Figure 2 illustrates the segments observed to operate at LOS F on the entire CMP network during the a.m. and p.m. peak periods. In addition, Appendices A1 and A2 list the details of all LOS F segments including their travel-time run information.

Improved LOS F Segments from the Prior Monitoring Cycle

The total number of improved segments from the previous monitoring cycle decreased from nineteen in 2010 to fifteen in 2012.

- Improved P.M. peak period segments – 11 in 2012 (10 in 2010)
- Improved A.M. peak period segments – 4 in 2012 (9 in 2010)

Appendix C, lists the segments that performed at LOS F in 2010 and improved in 2012.

AVERAGE SPEEDS

Table 5 shows the average speed on the complete CMP network by tier for each peak period. Analyzing the county as a whole, the survey results show that the speeds on freeways appear to have generally declined since the 2010 surveys with some areas showing improvements. The overall average speeds on the freeways decreased about 0.9 to 1.1 miles per hour between 2010 and 2012 while the speed decrease on arterials is between 1 and 1.5 miles per hour. The highest decline occurred during the a.m. for both freeways and arterials.

Table 5: Average Vehicle Speeds During Peak Periods on Alameda County CMP Roadways (in mph)

	2010 Results	2012 Results
Tier 1		
Freeways p.m.	51.8	50.9
Arterials p.m.	26.1[12]	25.1
Freeways a.m.	53.4	52.5
Arterials a.m.	28.0	26.5
Weekend 1-3 p.m.	—	62.2
Tier 2		
Arterials p.m.	—	25.1
Arterials a.m.	—	24.9

CMP NETWORK PERFORMANCE

The 2012 LOS results for the CMP network are described below by type of roadway (freeways, arterials and ramps and special segments) and data collection time period. Segments that operated at LOS F conditions are highlighted (for more detailed information about these LOS F segments, see Appendices A1 and A2) under each category as well as likely impacts by construction. Also included are lists of segments that operated at LOS F in 2010 but improved in 2012 (Appendix C); potential reasons for improvements are identified. Additionally, segments showing significant changes in performance (i.e., improvement or degradation by two levels of service since 2010) between 2010 and 2012 were identified (Tables 12 and 13). Further, corridor performance was analyzed by estimating the travel-time and speed data for the entire length of a CMP route by aggregating the segments for selective major CMP routes in the county (Appendices D1 and D2).

2012 LOS Results

General analysis shows that overall congestion increased on the CMP Network

[12] Corrected computational error for the 2010 average speeds data. Results for 2010 Arterials p.m. were previously reported in the 2010 LOS Monitoring Report as 28.7 mph.

since 2010. It is shown in the increased number of LOS F segments, decreased average speeds, and reduced number of improved segments as compared to the prior 2010 LOS monitoring year. Improvements were reported in few locations and appear to be related to completed construction activities. Few new bottlenecks were also reported.

The 2012 LOS results for each category of the roadways are analyzed and presented in the respective sections below.

Since weekend peak period monitoring on the freeways was commenced in 2012, only 2012 data were analyzed for weekend performance of the freeway network; thus, there is no comparative analysis with previous performance as done for data from other time periods. Similarly, Tier 2 was monitored for the first time in 2012 and additionally did not have levels of service assigned; therefore, only 2012 speed data was analyzed for the Tier 2 network performance for 2012.

Freeways (Tier 1)

Weekday—p.m. Peak Period

The 2012 surveys revealed that 27 segments operated at LOS F during the p.m. peak period. Out of the 27, 12 segments also performed at LOS F during the 1991 CMP baseline year (and are therefore grandfathered). Four of these 27 segments were operating at LOS F for the first time in 2012. Of the remaining 23 segments, nine appeared to have been impacted by construction activities (Table 6).

In terms of specific locations where congestion occurred in 2012, while the likely reasons for congestion on all the LOS F segments could not be identified, a majority of the LOS F conditions appear to be related to construction activities combined with the effects of the recovering economy. LOS F conditions on westbound I-80 and eastbound SR 24 in North County were likely due to Bay Bridge and Caldecott Tunnel construction respectively. Congestion continues to occur on eastbound I-580 in East County. Also, in 2012, new congestion was experienced on northbound I-880 between Alvarado-Niles Road and A Street and on eastbound I-580 between 1st Street and N. Flynn Road.

Table 6: LOS F Freeways segments—p.m.

#	CMP Route	Segment Limits	Jurisdiction
Grandfathered			
1	I-80 – EB	I-80/I-580 (Merge)-Powell	Emeryville-Berkeley
2	I-80 – EB	Powell-Ashby	Emeryville-Berkeley
3	I-80 – EB	Ashby-University	Emeryville-Berkeley
4	I-80 - EB	Jct I-580 Off-ramp-Central On-Ramp	Berkeley-Albany
5	I-80 – WB*	University-Ashby	Emeryville-Berkeley
6	I-80 – WB*	Ashby - Powell	Emeryville-Berkeley
7	I-80 – WB*	Powell - I-80/I-580 (Split)	Emeryville-Berkeley
8	I-580 – EB	I-80 - I-980	Oakland
9	I-880 – NB	Tennyson - SR 92	Hayward
10	I-880 – NB	SR 92 - A St	Hayward
11	SR 24 – EB*	I-580 On-ramp - Broadway/SR 13	Oakland
12	SR 24 – EB*	Broadway/SR 13 - Caldecott (Entrance)	Oakland
Non-Grandfathered			
13	I-80 – EB*	Toll Plaza - I-580 (SB Merge)	Oakland
14	I-80 – WB*	Jct I-580 - University	Berkeley-Albany
15	I-580 – EB	I-680 - Hopyard	Pleasanton
16	I-580 – EB	Hopyard - Santa Rita	Pleasanton
17	I-580 – EB**	1st St - Greenville	Livermore-County
18	I-580 – EB**	Greenville - N. Flynn	County
19	I-580 – WB*	SH-24 On-ramp - I-80/I-580 (Split)	Oakland
20	I-680 – NB	Rt 262/Mission - Durham Rd	Fremont
21	I-680 – NB	Durham Rd - Washington Blvd	Fremont
22	I-680 – NB**	Vargas Rd - Andrade Rd	County
23	I-880 – NB	Alvarado-Niles - Tennyson	Union City-Hayward
24	I-880 – NB**	I-880/I 80 (Split) - I-880/I-80 (Merge)	Oakland
25	SR 13 – NB*	Moraga Ave - Hiller (Signal)	Oakland
26	SR 13 - SB	Redwood - Jct I-580 (EB Merge)	Oakland
27	SR 84 - EB	Newark Blvd /Ardenwood Blvd - I-880 NB Off-ramp	Newark

Note: *Construction; **New LOS F segment

Weekday—a.m. Peak Period

The 2012 surveys revealed that 21 segments were operating at LOS F during the a.m. peak period. Five of these 21 segments were operating at LOS F for the first time. Of the remaining 16 segments, seven of them appeared to have been impacted by construction activities (see Table 7).

As in the p.m. peak period, Bay Bridge and Caldecott Tunnel construction appeared to have impacted westbound I-80 and eastbound SR 24 segments, respectively. Congestion on southbound I-880, south of SR 92 to Stevenson Boulevard, appeared to have intensified from 2010 with two additional LOS F segments occurring on this stretch of the freeway.

Table 7: LOS F Freeways segments—a.m.

#	CMP Route	Segment Limits	Jurisdiction
1	I-80 – WB*	Central - Jct I-580	Berkeley – Albany
2	I-80 – WB*	Jct I-580 - University	Berkeley – Albany
3	I-80 – WB*	I-580 Split - Toll Plaza	Oakland
4	I-80 – WB*	Toll Plaza - SF County	Oakland
5	I-238 – WB	I-580 - I-880	County-San Leandro
6	I-580 – WB	Greenville Rd - 1st St	Livermore – County
7	I-580 – WB	1st St - Portola Ave	Livermore
8	I-580 – WB	SH 13 Off-ramp - Fruitvale	Oakland
9	I-580 – WB*	SH-24 On-ramp - I-80/I-580 Split	Oakland
10	I-580 – EB**	Central - I-80 Jct	Albany
11	I-680 – SB**	Bernal Ave - Sunol Blvd	County
12	I-880 – NB	Marina Blvd - SR 112/Davis	Oakland - San Leandro
13	I-880 – NB**	SR 112/Davis - Hegenberger	Oakland - San Leandro
14	I-880 - SB	I-238 (Marina before '06) - A St	San Leandro - County
15	I-880 – SB**	Rt 92 - Tennyson	Hayward
16	I-880 – SB	Tennyson - Alvarado-Niles	Hayward - Union City
17	I-880 – SB	Alvarado-Niles - Alvarado	Union City – Fremont
18	I-880 – SB**	Alvarado - Decoto	Union City – Fremont
19	I-880 – SB	Decoto - Stevenson	Fremont
20	SR 13 – NB*	Moraga Ave - Hiller (Signal)	Oakland
21	SR 24 – EB*	Broadway/SR 13 - Caldecott (Entrance)	Oakland

Note: *Construction; **New LOS F segment

Freeways – Weekend Peak Period (1:00 p.m. – 3:00 p.m.)

In order to monitor the congestion from the recreational trips during the weekends, the county freeways were monitored for a mid-day peak period of 1-3 p.m. during the 2012 LOS Monitoring cycle. The weekend peak period was determined to be 1-3 p.m. based on Spring 2011 traffic data from the Caltrans' Freeway Performance Management System (PeMS) database. The 2012 LOS results showed that a majority of the roadways were performing at higher speeds with mostly LOS A conditions.

- LOS F conditions were reported on I-80 segments in both directions and I-580 segments connecting with I-80
- LOS E conditions were observed on westbound I-238 between I-580 and I-880, westbound I-580 at the county line, and northbound SR 13 near SR 24 (Caldecott Tunnel)

Freeways – Improved LOS F Segments

Table 8 lists the segments that were operating at LOS F in the 2010 surveys during a.m. and p.m. peak periods, but have improved in 2012. There were eight segments in the p.m. peak period and four segments in the a.m. peak period that improved. For comparison, in the 2010 LOS Monitoring Study, there were six p.m. peak period segments that showed improvement from prior LOS F conditions. Similarly, the number of improved LOS F segments in the a.m. peak period from the previous monitoring year decreased from five in 2010 to four in 2012.

While likely reasons for all improvements were not clear, a majority appear to be due to the improvement projects completed since the 2010 LOS monitoring. Improvement on I-880 in both south and central parts of the county, SR 92 in Central County and I-580 in East County could be attributed to two projects that were completed after the 2010 LOS monitoring. It also appears to be the reason for the increased number of improved p.m. peak period segments. Improvements on I-880 and SR 92 are likely due to the completed

I-880/SR 92 Interchange construction. Similarly, improvement on eastbound I-580 in East County appeared to be due to the opening of I-580 HOV lanes. This project was under construction during 2010 LOS monitoring.

Table 8: Segments at LOS F in 2010 and not in 2012

#	CMP Route	Segment Limits	Jurisdiction
p.m. peak period			
1	I-580 - EB	San Ramon/ Foothill - I-680	County - Pleasanton
2	I-580 - EB	Santa Rita - El Charro	County - Pleasanton
3	I-580 - EB	Harrison - Lakeshore	Oakland
4	I-580 - EB	Coolidge - SH 13 Off-ramp	Oakland
5	I-880 - NB	Decoto - Alvarado Blvd	Fremont - Union City
6	I-880 - NB	Alvarado Blvd - Alvarado-Niles Blvd	Fremont - Union City
7	I-980 - EB	I-880 - SR 24 @ I-580	Oakland
8	SR 92 - EB	Clawiter - I-880	Hayward
a.m. peak period			
1	I-880 – NB	Alvaraddo Niles – Tennyson	Union City – Hayward
2	I-880 – NB	High/42nd – 23rd (1st On-ramp)	Oakland
3	I-880 – SB	A St – SR 92	Hayward
4	SR 84 – WB	Paseo Padre Pkwy – Toll Plaza	Newark - Fremont

Arterials (Tier 1)

Weekday—p.m. Peak Period

The 2012 surveys revealed that 11 arterial segments operated at LOS F during the p.m. peak period (Table 9). One LOS F segment was a grandfathered segment. Three of these 11 segments operated at LOS F for the first time, including two segments that appeared to be impacted by construction activities. Of the remaining seven segments, three of them appeared to have been impacted by construction activities.

Table 9: LOS F Arterials Segments—p.m.

#	CMP Route	Segment Limits	Jurisdiction
Grandfathered			
1	SR 92 – EB*	I-880 - Mission	Hayward
Non-Grandfathered			
2	A Street – EB***	Western - SR 238	Hayward
3	Hesperian – NB*	Grant - Lewelling	County
4	Hesperian – SB*	Springlake - Lewelling	County
5	Hesperian – SB	SR 92 – WB - Tennyson	Hayward
6	University – WB**	Sacramento - San Pablo	Berkeley
7	SR 84 - EB	Sunol Road - Pleasanton-Sunol Road	Fremont
8	SR 84 - EB	SR 84 (Off-ramp)/ I-680 - Vallecitos Lane	County
9	SR 123 San Pablo – NB	Allston - University	Berkeley
10	SR 185 (14th) – NB*	46th Street - 42nd	Oakland
11	SR 238 (Foothill) – NB***	Jackson - City Center	Hayward

Note: *Construction; **New LOS F segment; ***New LOS F segment likely impacted by construction

Construction in Central County [SR 238 (Foothill) Operational Improvements] and maintenance work on Lewelling Boulevard appeared to have impacted most of the arterials that were performing at LOS F. In addition, 42nd/High Street Improvements occurring in North County created congestion on westbound SR 185 in Oakland.

Weekday—a.m. Peak Period

The 2012 surveys reported that five segments operated at LOS F during the p.m. peak period (Table 10). One segment out these five, westbound SR 84 south of Ruby Hill, was operating at LOS F for the first time. Also, two of them, northbound Hesperian in Central County and westbound SR 185 in North County, appeared to have been impacted by construction activities.

Table 10: LOS F Arterials Segments—a.m.

#	CMP Route	Segment Limits	Jurisdiction
1	Hesperian – NB*	Grant –Lewelling	County
2	SR 84/Fremont – WB	Peralta-Thornton	Fremont
3	SR 84 – EB	Sunol Road-Pleasanton-Sunol	Fremont
4	SR 84 – WB**	Ruby Hill /Kaithoff-Culvert (Lat/Long: 37.613854,-121.817224)	Pleasanton
5	SR 185 (E14th) – NB*	46th St – 42nd	Oakland

Note: *Construction; **New LOS F segment

Arterials (Tier 1)-Improved LOS F Segments

Two segments operated at LOS F in 2010 showed improved performance in 2012 during the p.m. peak period:

- Northbound Hesperian (La Playa-W. Winton Ave.) in Hayward
- Eastbound SR 13 Ashby (College–Domingo) in Berkeley

Performance during the a.m. peak period appeared to have not changed much in terms of congested segments between 2010 and 2012. In 2010, there were three improved arterial segments reported compared to the prior monitoring cycle in both peak periods.

Arterials (Tier 2)

Starting in the 2012 LOS Monitoring cycle, the 90-mile (193 segments) Tier 2 roadways were monitored. Free Flow Speed surveys are required to determine the classification of these arterials, which will in turn determine the service levels of the arterial segment based on the speed data. Since these surveys will be completed prior to or during the 2014 LOS Monitoring cycle, only speed data are reported and analyzed in the 2012 LOS Monitoring report instead of levels of service.

Weekday—p.m. Peak Period

Out of the total 193 Tier 2 segments monitored, over 150 segments performed in the speed range of 10 to 30 miles per hour, which were almost equally divided between the ranges of 10 to 20 miles per hour (81 segments) and 20 to 30 mph (75 segments). Reflective of the dense urban development in North County, there were more Tier 2 arterial segments operating in the lower range of speed (10 to 20 miles per hour). Regarding the number of segments operating in the middle speed range (20 to 30 miles per hour), an equal number of segments were found to be located between the North County, South County, and East County. Segments operating at the higher range of speed (30 miles per hour and above) included a larger number of segments from East County, particularly the roadways that traverse the less dense and fringe areas of the county crossing the county line.

There were four Tier 2 Arterial segments performed at the lowest speed range (10 miles per hour and below). Three were located in North County and one was located in Central County:

- Westbound Broadway between 14th Street and 5th Street (Speed - 8.3 mph)
- Southbound International Boulevard between Fruitvale Avenue and 42nd Avenue (Speed – 8.0 mph)
- Westbound High Street between Foothill Boulevard and northbound I-880 Off Ramp (Speed – 9.2 mph)
- Winton Avenue-D Street between Soto Road and Foothill Boulevard/D Street (Speed –8.8 mph)

With the exception of westbound Broadway between 14th and 5th Streets, the other three segments were impacted by construction activities. Performance of the westbound Broadway segment at the lowest speed in normal conditions appears to be consistent with traffic conditions in typical downtown areas that have multimodal characteristics.

Tier 2 segments with the highest range of speed (40 mph and above) were reported in East County, particularly the roadways that traverse the less dense and fringe areas of the county crossing the county line.

- Three segments of Vasco Road crossing the county line in both northbound and southbound directions showed speeds of over 50 miles per hour, with the highest speed being 56.4 miles per hour for the southbound Vasco Road from the county line to N. Vasco/Vasco Road.
- Other roadways with speeds ranging between 40 and 50 miles per hour were:
    - Crow Canyon Road in both directions near the county line
    - Northbound Dougherty Road near the county line

- Sunol Boulevard-1st Street-Stanley Boulevard in both directions between Bernal Avenue and SR 84

Weekday—a.m. Peak Period

Out of the total 193 Tier 2 segments monitored, over 163 segments performed at a speed range of 10 to 30 miles per hour. There were a greater number of segments (90 segments) performing in the 20 to 30 miles per hour range and slightly fewer number of segments (73) performing in the 10-20 miles per hour range. The lower speed range had more segments located in North County, while the middle speed range had segments equally distributed between all parts of the county. Similar to the p.m. peak period results, segments operating at the higher speed ranges of 30 miles per hour and above included more number of segments from East County.

Two segments operated at 10 miles per hour and below speed conditions, and both were impacted by construction activities:

- Southbound High Street between Foothill Boulevard and northbound I-880 Off Ramp
- Westbound A Street between Redwood Road/Grove Way and Foothill Boulevard/A Street

Regarding the roadways that performed at the highest speed range of 40 miles per hour and above, a majority of the roads identified in the a.m. peak period also performed at this speed in the p.m. peak period. There were nine segments operating at these conditions, and one Vasco Road segment crossing the county line showed the highest speed of 53 miles per hour.

Listed below are the roadways some contain more than one segment that performed at speeds between 40 and 50 miles per hour:

- Northbound Vasco Road between Dalton Avenue to county line
- Crow Canyon Road in both directions near the county line
- Northbound Dougherty Road near the county line
- Southbound Tassajara Road near the county line
- Northbound Sunol Boulevard-1st Street-Stanley Boulevard between Bernal Avenue and SR 84

Ramps and Special Segments (Tier 1)

Weekday—a.m. and p.m. Peak Periods

The 2012 surveys revealed that one ramp or special segment each is operating at LOS F during both the a.m. and p.m. peak periods. The p.m. segment located on SR 13/SR 24 interchange appears to be impacted by Caldecott Tunnel construction activities. (see Table 11).

Table 11: LOS F Ramps and Special Segments—p.m. and a.m.

#	CMP Route	Segment Limits	Jurisdiction
p.m. peak period			
1	SR13/SR 24 Interchange*	SR-13 NB - SR-24 EB	Oakland
a.m. peak period			
2	I-880/SR 260 Connection	SR-260 EB - I-880 NB	Oakland

Note: *Construction

Ramps and Special Segments (Tier 1) – Improved LOS F Segments

One segment, the connection between eastbound SR 260 (Posey Tube) and northbound I-880, showed improvement in the p.m. peak period:

- I-880/SR 260 Connection (eastbound SR-260 – northbound I-880) in Oakland

However, the same segment appeared to have degraded from LOS E to F in the a.m. peak period between 2010 and 2012. In both cases, the speed increase and decrease were relatively marginal.

Segments with Notable Changes in the Last Two Years

Tables 12 and 13 show the roadways and segments for which the surveys of the 2012 a.m. and p.m. peak periods reported significant changes (i.e., a change of two or more LOS grades between 2010 and 2012) in

the travel-time results as compared to previous monitoring cycle.

Table 12: Segments with Significant Changes from Previous Year—p.m. Peak Period

#	CMP Route	Segment Limits	LOS (Speed) 2010	LOS (Speed) 2012
Segments with Decrease in Speed Resulting in Level of Service Change of 2 or More Grades				
1	I-238 - EB	I-880 - I-580	A (62.3)	E (38.7)
2	I-238 - WB	I-580 - I-880	A (61.8)	C (52.1)
3	I-580 - EB	Grove - Eden Canyon	A (72.9)	C (54.3)
4	I-580 – WB*	SH-24 On-ramp - I-80/580 Split	B (56.7)	**F20** (14.2)
5	I-580/I-680 Interchange	I-680 NB - I-580 EB	A (58.2)	C (47.5)
6	I-580/I-680 Interchange	I-580 WB - I-680 SB	B (31.3)	D (25.1)
7	I-80/I-580 Interchange	I-580 WB - I-80 NB	A (40.1)	D (26.3)
8	I-880 - NB	A St - I-238	A (62.7)	D (45.1)
9	I-880 - NB	Dixon Landing - SR 262/Mission	C (52.1)	E (32.9)
10	I-880 - SB	Alvarado - Decoto	B (58.9)	D (42.2)
11	I-880 – SB*	23rd St - High/42nd	A (67.9)	E (37.3)
12	Hesperian - NB	Hacienda - Grant	B (29.4)	D (16.6)
13	Hesperian - NB	W. Winton Ave - A St	C (18.1)	E (13.9)
14	Park/23rd – EB*	Encinal - Santa Clara	B (21.3)	D (11.2)
15	SR 123 San Pablo - NB	35th - Park	C (18.4)	E (12.3)
16	SR 123 San Pablo- SB	Dwight - Ashby	C (20.2)	E (13.6)
17	SR 123 San Pablo - SB	Stanford - 53rd	B (26.3)	D (17.1)
18	SR 13 Ashby - EB	I-80 - San Pablo	C (19.8)	E (13.9)
19	SR 185 (14th) - NB	98th Ave - 73rd Ave	C (18.2)	E (13.9)
20	SR 238 (Foothill) – NB*	Jackson - City Center	C (17.3)	**(F)** (6.4)
21	SR 238 (Foothill) – SB*	City Center - Jackson	C (16.2)	E 8.9
22	SR 84 - EB	Thornton - Newark Blvd/ Ardenwood Blvd	A (65.8)	D (45.9)
23	SR 92 – EB*	I-880 - Mission	D (15.4)	**(F)** (6.9)
24	SR 92 - EB	San Mateo Cty Line - Toll Plaza	A (65.9)	D (47.4)
25	University - EB	I-80 SB - 6th	B (26.7)	D (16.9)
26	I-880/I-238 Interchange	I-880 NB - I-238 EB	A (59.3)	E (17.5)
27	SR13/SR 24 Interchange*	SR-24 WB - SR-13 SB	A (32.7)	C (24.0)
Segments with Increase in Speed Resulting in Level of Service Change of 2 or More Grades				
28	I-580 – EB**	SR 84/Airway Blvd. - Portola	C (53.5)	A (61.0)
29	I-580 – EB**	El Charro - SR 84/Airway Blvd.	D (41.1)	B (56.1)
30	I-580 - EB	Coolidge - SH 13 Off	**(F30)** (31.4)	C (52.1)
31	I-880 - NB	Decoto - Alvarado Blvd	**(F30)** (28.6)	D (42.8)
32	I-880 - SB	Hegenberger - SR 112/Davis	E (37.6)	C (51.7)
33	I-880 - SB	I-238 - A St	E (32.3)	C (53.9)
36	Park/23rd - EB	Kennedy - E 11th	E (13.9)	C (19.8)
37	SR 112 (Davis) - EB	I-880 - San Leandro	D (17.2)	B (26.2)
34	SR 92 – EB***	Toll Plaza - Clawiter	E (37.6)	C (49.7)
35	SR 92 – EB***	Clawiter - I-880	**(F20)** (10.0)	C (54.4)
38	University - EB	San Pablo - Sacramento	E (11.5)	C (18.4)

Note:
* Construction
** Completed HOV lane
*** Completed improvements

Table 13: Segments with Significant Changes from Previous Year—a.m. Peak Period

#	CMP Route	Segment Limits	LOS (Speed) 2010	LOS (Speed) 2012
Segments with Decrease in Speed Resulting in Level of Service Change of 2 or More Grades				
1	I-580 - WB	Grant Line - N Flynn	A (65.6)	D (45.9)
2	I-580 - WB	N Flynn - Greenville Rd	A (65.1)	E (36.6)
3	I-580 - WB	Tassajara Rd - I-680	A (66.3)	C (49.1)
4	I-580 - WB	Fallon Rd/El Charro - Tassajara	B (57.5)	D (45.1)
5	I-580 - WB	Center - I-580/238	B (57.4)	D (47.5)
6	I-580 - WB	SR 84/Airway Blvd - Fallon Rd/El Charro	C (50.9)	E (40.9)
7	I-680 - NB	I-580 - Alcosta	A (60.6)	D (47.9)
8	I-680 - SB	Washington Blvd - Durham Rd	A (60.6)	C (51.0)
9	I-680 - SB	Durham Rd - Rt 262/ Mission	A (62.4)	C (51.3)
10	I-680 SB	I-580 - Stoneridge Dr	A (61.9)	D (44.5)
11	I-680 SB	Stoneridge Dr - Bernal	B (55.8)	E (40.5)
12	I-680 SB	Bernal Ave. - Sunol Blvd	D (43.9)	**(F30)** (27.5)
13	I-80 - WB	Central - Jct I-580	D (44.1)	**(F30)** (22.7)
14	Adeline - NB	MLK Jr – South - MLK Jr - North	C (18.6)	E (12.9)
15	Hesperian - NB	La Playa - W. Winton Ave.	B (25.8)	D (15.7)
16	Park/23rd – WB*	Santa Clara - Encinal	B (22.0)	D (12.4)
17	SR 112 (Davis) - EB	Doolittle - I-880	A (31.2)	C (23.5)
18	SR 238 (Foothill) – NB*	City Center - I-580	A (30.9)	C (19.5)
19	SR 260 (Tubes) - NB	Atlantic - 7th/Web	A (34.7)	C (18.0)
20	SR 61 (Doolittle) - NB	Island Dr - High/Otis	C (21.6)	E (12.3)
21	SR 61 (Doolittle) - SB	Airport - Davis	A (40.6)	C (27.6)
22	SR 84 - EB	Sunol Rd - Plea-Sunol Rd	D (19.2)	**(F)** (9.3)
23	SR 84 - WB	Ruby Hill /Kaithoff - Culvert (Lat/Long: 37.613854,-121.817224)	B (47.4)	**(F)** (18.1)
24	University - EB	ML King - Shattuck Pl	A (25.6)	C (18.0)
25	I-880/I-238 Interchange	I-238 WB - I-880 SB	A (47.2)	D (36.8)
26	SR13/SR 24 Interchange	SR-24 WB - SR-13 SB	A (32.0)	C (23.5)
Segments with Increase in Speed Resulting in Level of Service Change of 2 or More Grades				
27	I-580 - WB	Foothill/ MacArthur - SH 13 Off	E (36.2)	A (61.4)
28	I-880 - NB	Tennyson - SR 92	D (44.9)	A (64.5)
29	I-880 - SB	I-880/I-80 merge - Jct 980	D (46.5)	A (83.0)
30	I-880 - SB	I-980 - 23rd	D (46.2)	A (60.7)
31	SR 123 San Pablo - NB	Gilman - Marin	C (26.4)	A (32.5)
32	Tennyson - WB	I-880 - Hesperian	E (16.0)	C (22.3)
33	University - EB	San Pablo - Sacramento	E (12.7)	C (19.6)
34	I-880/I-238 Interchange	I-238 WB - I-880 NB	D (32.7)	A (51.7)

Note:
* Construction

Tables 12 and 13 show that overall there are more segments showing a decrease in speed compared to the number of segments showing an increase in speed between 2010 and 2012.

Although the potential reasons for all significant changes identified are not clear, a majority of improvements appear to be due to the projects completed since the 2010 monitoring period and congestion appears to be attributable to construction activities across the county combined with the effects of the improving economy. Tables 12 and 13 also identify the segments impacted by construction activities.

As mentioned previously, projects completed on I-880 (I-880/SR 92 Interchange Improvements) and I-580 (eastbound I-580 HOV Lane) appeared to have resulted in improved segments on eastbound SR 92, northbound I-880 and eastbound I-580 near the I-580/I-680 interchange, respectively.

On northbound I-880, a new congested segment was reported in 2012 between Tennyson Road and A Street while the

segment between Alvarado-Niles and Tennyson continued to be congested as in 2010. A new bottleneck was reported between 1st Street and N. Flynn Road on eastbound I-580. On southbound I-680, decreased speeds were reported from I-580 interchange to Sunol Boulevard in 2012 during the a.m. peak period. The segment between Bernal and Sunol Boulevards was reported as operating at LOS F.

Reasons for the new congestion on northbound I-880 in Central County and eastbound I-580 in East County in the p.m. peak periods will be studied further. The Express Lane Evaluation (After) Study that is currently underway will investigate the potential causes of congestion on southbound I-680 in the a.m. peak period between I-580/I-680 Interchange and Sunol Blvd. This is discussed in Chapter 6 in detail.

CORRIDOR PERFORMANCE ANALYSIS

The 2012 p.m. peak period travel-time and speed survey results were compared to the survey results from 1991 to 2010 on the major routes on the Alameda County CMP network. Only p.m. peak period data were analyzed since they are used for Conformity. Appendix D-1 shows these results for freeway corridors, while Appendix D-2 lists the major arterial corridors. For each route, the segments have been aggregated to show the entire length of the route in Alameda County.

Freeways

Average speeds on two freeway corridors increased notably in 2012 compared to 2010, while two freeway corridors experienced significant drop in speed. The freeways that experienced a significant increase in speed are:

- Eastbound I-580 from SR 238/Foothill to 1-205: This 30.3-mile corridor operated at LOS E (30.8 mph) in 2010. The 2012 surveys showed average speeds increase of 9.6 mph to 40.4 mph, an increase of 31.2 percent, although it was still operating at LOS E.
- Southbound SR 13 from Hiller to Jct. I-580: This corridor is 5.5 miles long, and had a travel speed of 57.2 mph in 2012, and was at LOS B. This shows an improvement of 17.8 mph over the 2010 speed of 39.4 mph (LOS E).

Conversely, average speeds dropped in two corridors as noted below:

- Eastbound I-80 from Tollgate to Central: Average speeds on this 6.4 mile corridor have degraded from 28.5 mph in 2010 to 22.0 mph in 2012; it remains operating at LOS F.
- Northbound SR 13 between Mountain and Hiller: This 5.4 mile corridor experienced a drop in speed from 35.1 mph (LOS E) in 2012 compared to 41.3 mph (LOS D) in 2010.

Other corridors either showed modest increases or decreases in speeds.

Arterials

Average speeds remained mostly steady with notable decreases on four arterial routes along with modest increases on six arterial routes between 2010 and 2012.

The four notable decreases in speeds occurred on:

1) Southbound SR 123: speeds decreased 2.4 mph from 18.6 mph (LOS C) in 2010 to 16.2 mph (LOS D) in 2012.
2) Northbound SR 123: speeds decreased 2.5 mph from 18.2 mph (LOS C) in 2010 to 15.7 mph (LOS D) in 2012.
3) Northbound SR 238 (Mission) from I-680 to Jackson: average speeds decreased from 26.8 mph in 2010 to 23.6 mph in 2012, remaining at LOS C.
4) Westbound University Avenue from Shattuck to I-80 Off Ramp: average speeds decreased from 17.3 mph in 2010 to 14.2 mph in 2012, remaining at LOS D.

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3. TRAVEL-TIME STUDIES OF ORIGIN-DESTINATION PAIRS

This section describes travel-time surveys between selected origin and destination (O-D) points for auto, transit, bicycle and HOV lane trips. Also included is travel-time data for the three Bay Bridge Crossings that connect Alameda County to San Francisco and San Mateo Counties.

The purpose of the O-D surveys is to evaluate the comparative performance of various transportation modes between major employment centers and residential areas in Alameda County to provide insight into journey-to-work travel times. Similarly, since the Bay Bridge Crossings are important county-to-county regional links, travel-time data on these bridges show how these connections are performing over time.

For the O-D surveys, ten origin-destination pairs (see Appendix F) have been generally studied to simulate typical commute trips on the County's major travel corridors. These paired surveys were run simultaneously in the same corridor. Out of the total ten O-D pairs, all were surveyed for auto, and nine for transit. Eight pairs were surveyed during the p.m. peak period, and two during the a.m. peak period. In addition, bicycle travel times were recorded for one O-D pair between Emeryville and Berkeley, while one pair included HOV lane travel between Fremont and San Jose.

Out of the total ten pairs, the first five pairs were surveyed from 1996 until 2002. Four additional O-D pairs were surveyed for the first time in 1998. An additional survey of HOV lane travel times was added for one of the O-D pairs (Fremont to San Jose) in 2000. These ten trip combinations, and the specific routes that were followed, are listed in Appendix F. Over the years, for few cases, changes were made to the origin or destination locations to accommodate transit service changes. The new destinations were selected to be as close to the previous destination as possible, in a residential area, and approximately the same distance from the previous transit station or bus stop.

Travel-time data for the three Bay Bridge Crossings were previously reported in the LOS Monitoring Reports in 2002, 2004 and 2010 (reported 2009 data). The data represents travel time on all the bridges for the a.m. and p.m. commute periods between origin and destination in the segments between I-880 or I-80 in Alameda County across the bridges to SR 101 in San Francisco and San Mateo Counties. Data for 2002 and 2004 were based on the auto travel-time data collected by Caltrans. Data for 2009 and 2012 are based on MTC's 511.org Toll Tags data.

In the 2012 monitoring cycle, data collected for four O-D pairs were found to not meet the data collection standards; therefore, the data were declared as unqualified as reported in Table 15 and described in Appendix F. Data for the remaining six O-D pairs were analyzed and reported.

SURVEY METHODOLOGY

Except for the O-D surveys on the bridges where toll tags data were used instead, two surveyors, one driving an auto and one taking transit (or a bicycle in one case), traversed between the designated origin and destination points, documenting their travel times and identifying any anomalies that they encountered during the course of their trip (e.g., a traffic accident). Transit trips were taken either on buses (AC Transit, UC Transit, VTA, Wheels), rail (BART or ACE), or a combination of these modes. The bicycle trip was taken on local streets in Emeryville and Berkeley. Whenever possible, the auto and transit trip started on the same day at the same time.

Surveys were conducted on mid-week days (Tuesday through Thursday) during the period between the second weeks of March 2012 and June 2012 on two different days. The data for all O-D pairs were collected during the p.m. peak period (4:00 to 6:00 p.m.) with the exception of two pairs between Fremont and San Jose, which were surveyed during the a.m. peak period (7:00 to 9:00 a.m.). Travel-time data were recorded for each trip. Table 14 lists the time components that were noted for each type of trip.

Table 14: Time Components of Origin-Destination Surveys

Auto Trip	Transit Trip
Start time at origin door (walk)	Start time at origin door (walk)
Auto departs parking	Arrive at first transit stop
Merge onto 1st freeway	Board 1st bus/rail
	Exit 1st bus/rail
Merge onto 2nd freeway	Board 2nd bus/rail
	Exit 2nd bus/rail
Exit from freeway	Board 3rd bus/rail
Arrive at parking	Exit 3rd bus/rail
Arrive at destination door (walk)	Arrive at destination door (walk)

For the analysis of transit trip data, no more than half of a route's scheduled headway was used for the initial waiting time. The actual waiting time was used for all other transit transfers. The Emeryville-Berkeley O-D Pair is generally surveyed by bicycle in addition to the transit and auto travel. No data for this O-D pair have been reported for 2012 as the collected data did not meet the data collection standards.

2012 SURVEY RESULTS

O-D Pairs

For the six O-D pairs for which new data were reported in 2012, travel times by both auto and transit either increased or stayed the same for travel between Fremont and San Jose using both HOV and general purpose lanes. All other pairs showed slight decreases in auto travel time and increases in transit travel time. The worst transit commute was between Hayward and Livermore (112 minutes) although data for the O-D pair, Fremont-Pleasanton, that experiences the usual longer transit travel time was not reported this time. For the O-D pairs studied, transit travel times range between 2-5 times longer than auto travel, which is similar to conditions prior to 2010, but slightly worsened from the 2010 results where transit travel times ranged between 2-4 times longer than travel by auto.

Auto Times

Table 15 lists the results of the 2012 O-D surveys and also includes a comparison with the previous surveys. Of the six O-D pairs reported, auto travel time either increased or remained the same for travel between Fremont and San Jose while auto travel time between remaining four O-D pairs improved. The largest comparable decrease was between Fremont and Alameda where the auto travel time decreased by 17 percent or 8 minutes. This improvement for travel between Fremont and Alameda is consistent with the improvement in average corridor speed reported on the northbound I-880 in the afternoon between Fremont and Alameda in the Tier 1 LOS Monitoring element although this corridor experienced few congested locations. Improvement in travel time for travel between Hayward and Livermore by 13% or 13 minutes could be attributed to the change in travel route taken by using the previous exit on I-580 to Livermore compared to what was done until 2010.

Table 15: Origin-Destination Pair Travel Times

					1998	2000	2002	2004	2006	2008	2010	2012			
O-D Pair	Origin	Destination	Mode	Driving Distance	Avg. (min)	Avg. (min)	Avg. (min)	Avg. (min)	Avg. (min)	Avg. (min)	Avg. (min)	2012 Avg. (min)	No. of Runs	Range of Times	Percent Variation from '10
1* p.m.	Hayward	Newark	Auto	11.2 mi	24	22	22	16	19	14	15	14	4	13-16	-7
			Transit		88	92	79	90	86	74	57	76	2	65-88	33
2 p.m.	Emeryville	Berkeley	Auto	4.8 mi	25	26	25	28	22	22	24	N/A	N/A	N/A	Unqualified data
			Transit		61	n/a	56	53	45	70	59	N/A	N/A	N/A	
			Bike		33	30	30	33	30	32	47	N/A	N/A	N/A	
3* p.m.	Hayward	Livermore	Auto	34.5 mi	53	45	49	61	61	54	51	38	4	34-45	-25
			Transit		144	152	141	120	113	143	N/A	112	2	101-124	22**
4 p.m.	Oakland	San Leandro	Auto	10.8 mi	35	29	32	41	34	27	27	24	4	22-28	-11
			Transit		74	64	56	70	66	78	67	76	2	69-84	13
5* p.m.	Fremont	Pleasanton	Auto	18.0 mi	31	34	33	27	39	26	37	N/A	N/A	N/A	Unqualified data
			Transit		130	122	125	146	181	145	154	N/A	N/A	N/A	
6 a.m.	Fremont	San Jose	Auto	14.8 mi	39	55	49	30	33	27	28	28	4	22-37	0
			Transit		129	104	118	94	111	82	73	93	2	89-98	27
7 a.m.	Fremont	San Jose	Auto	14.8 mi	---	35	34	27	25	23	23	25	4	21-30	9
8* p.m.	Oakland	Pleasanton	Auto	26.6 mi	58	60	62	45	57	41	52	N/A	N/A	N/A	Unqualified data
			Transit		81	96	91	77	75	107	74	N/A	N/A	N/A	
9 p.m.	Fremont	Alameda	Auto	25.2 mi	50	57	53	64	52	43	48	40	4	34-46	-17
			Transit		86	74	70	123	102	94	91	88	2	84-92	-3
10 p.m.	Alameda	Oakland	Auto	6.8 mi	21	17	21	22	21	22	24	N/A	N/A	N/A	Unqualified data
			Transit		51	47	45	45	43	51	52	N/A	N/A	N/A	

* Destination for these four O-D pairs changed since 2004.
** Comparison made with 2008 data as 2010 data was not available.
Note: For details on unqualified data, please refer to Appendix F.

Transit Times

Of the five O-D pairs for which data were reported for transit, transit travel times degraded on three pairs with one pair, Fremont-Alameda showing improvement with a 3% decreased travel time (three minutes) compared to the travel time in 2010. One pair (Hayward-Livermore) did not have data from 2010 for comparison. The largest transit travel time increase was between Hayward and Newark, where the travel time increased by 33% (57 minutes to 76 minutes). The degradation in transit travel time is likely due to the service cuts implemented by AC Transit in 2011.

Travel Times on Bay Bridge Crossings

Data for 2002 and 2004 data for the Bay Bridge Crossings were based on the auto travel-time data collected annually by Caltrans on all the bridges for the a.m. and p.m. commute periods. However, similar and comparable data was not available after 2004 because Caltrans stopped collecting travel-time data on Bay Area freeways and MTC took over the monitoring responsibility. Even though MTC's annual Freeway Congestion Monitoring program focused only on congested freeway segments, and therefore only data for the Bay Bridge was collected, MTC has suspended the Monitoring program since 2008. Since this data is not used in the annual CMP Conformity process, Toll Tags data from MTC's 511.org has been reported since the 2010 LOS Monitoring Study. Table 16 presents the data for all the three bridges for 2002, 2004, 2010 (reported 2009 data), and 2012 monitoring cycles. The data presented are for the weekday peak periods, consistent with the data from prior years.

Comparison between the 2009 and 2012 travel-time data across the three bridges show that travel time across the bridges in general has increased in both directions and during both peak periods with the exception of San Mateo Bridge. The San Mateo Bridge shows improvement in both directions during the p.m. peak period with eastbound trips showing highest travel-time reduction of 19% (16.5 minutes in 2009 to 13.4 minutes in 2012), likely due to completion of the I-880/SR 92 interchange improvements. Bay Bridge travel time increased more in the p.m. peak period for both directions (an increase of 28% and 15% for westbound and eastbound p.m. peak period compared to 6% and 4%, respectively, for the a.m. peak period). Regarding Dumbarton Bridge, travel time in the commute directions, westbound travel in the a.m. and eastbound travel in the p.m., show a greater increase (26% and 25% compared to 10% and 14%) in travel time compared to the opposite directions for both peak periods.

The Bay Bridge Crossings travel-time data presented for 2009 and 2012 in Table 16 shows significantly shorter travel time across the bridges compared to the previous two years. In this regard, the following points are to be kept in mind when using the toll tags data reported, as these make the data not directly comparable with the previous years:

- *Shorter travel time*: Since autos with toll tags do not slow down at the toll plazas they will tend to show shorter travel time than the ones that go through cash-only lanes.
- *Different Segment Termini:* Origin and Destination points for many of the bridges are different because of the different sources of data.
- *Different Economy*: The economy in 2009 and 2012 are down or recovering economies compared to the booming or stable economies in 2001 and 2003, which will reflect in the commute travel time.

Table 16: Travel Times on Bay Bridge Crossings

Bridge	Time Period	From-To	2001		2003		2009	2012	Percent Difference between 2009-2012
			Segment Travel Time	Total Travel Time	Segment Travel Time	Total Travel Time	Total Travel Time	Total Travel Time	
Dumbarton Bridge (SR 84)	**Westbound (toward San Mateo County)**								
	a.m.	2001-03: I-880 - US 101	25	32	7	14	9.7	12.2	26%
	a.m.	2009-12: I-880 - SR 84 @	7		7				
	p.m.	University Ave	6	12	6	11	8.8	9.7	10%
	p.m.		6		5				
	Eastbound (toward Alameda County)								
	a.m.	2001-03: US 101 - I-880	6	12	5	11	10.8	12.3	14%
	a.m.	2009-12: SR 84 @ University	6		6				
	p.m.	Ave - I-880	17	26	14	23.5	11.1	13.9	25%
	p.m.		9		9.5				
San Mateo Bridge (SR 92)	**Westbound**								
	a.m.	2001-03: I-880 - US 101	20	27	8	15.5	12.3	15.3	24%
	a.m.	2009-12: I-880 - SR 92 @	7		7				
	p.m.	Foster City Blvd	8	15	7	14.5	10.9	10.8	-1%
	p.m.		7		7.5				
	Eastbound								
	a.m.	2001-03: US 101 - I-880	7	13	7	14	10.5	10.9	4%
		2009-12: SR 92 @ Foster City	6		7				
	p.m.	Blvd - I-880	20	39	7	24	16.5*	13.4	-19%
			19		17				
Bay Bridge (I-80)	**Westbound**								
	a.m.	2001-09: I-580 merge - 5th	—	31	—	26	12.8*	13.6	6%
		St Off-ramp	—		—				
	p.m.	2009-12: I-880@ 7th St to	—	17	—	23.5	12.6*	16.1	28%
		I-80 @ Fremont St	—		—				
	Eastbound								
	a.m.	2001-03: Sterling St On-	—	8	—	8	7.9*	8.2	4%
		ramp - I-580 Off-ramp	—						
	p.m.	2009-12: I-80 @ 4th St to	—	14	—	17.5	12.2*	14	15%
		I-880 @ Grand Ave							

* Reflects computation error correction to previously reported data

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4. TREND ANALYSIS

Based on the data collected, performance of the CMP Tier 1 network has been reported in the LOS Monitoring Studies using two measures – average speeds (since 1991) and vehicle hours of delay (since 2008). Using the data reported for these measures, the long-term trend in CMP network performance was analyzed in terms of the following:

- the delays occurring on the network
- the relationship between average speeds on the network and external factors that would impact traffic volume on the network
- the relationship between average speeds on the network and vehicle throughput

VEHICLE HOURS OF DELAY (VHD)

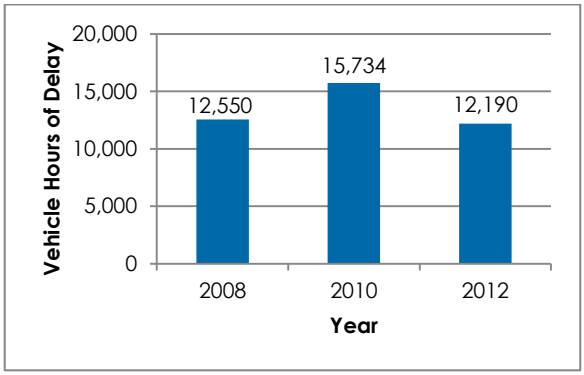
Since 2008, VHD for the LOS F freeway segments were reported. Consistent with the Caltrans and MTC definitions, VHD is described as having the congested threshold speed at 35 miles per hour or less and the bottleneck capacity as 2,200 vehicles per hour per lane. Since the average speed observed in the LOS Monitoring Study is based on the floating car runs over the 2-hour peak period, for VHD estimation purposes, congestion was assumed to occur only in this 2-hour peak period (Caltrans and MTC measure the actual congestion period by conducting the floating car runs beyond this 2-hour period). The total vehicle hours of delay was calculated by:

1) estimating the difference between how long it takes to travel a CMP LOS F network segment at 35 mph (congested threshold speed per Caltrans and MTC) and the actual speed that was observed in the travel-time survey; and
2) multiplying the difference in time estimated by the number of lanes, capacity per lane and the assumed congestion duration of 2 hours.

VHD During the p.m. Peak Period

Chart 1 shows the estimated total VHD on the LOS F freeway segments during the p.m. peak period for the past three LOS Monitoring cycles since 2008.

Chart 1: Vehicle Hours of Delay in LOS F Segments During the p.m. Peak Period



Despite a general increase in congestion reported in 2012, the VHD for the p.m. peak period shows a reduction from 2010, with a delay of 12,190 in 2012 compared to 15,734

in 2010. It is likely that this decrease is attributed to two completed projects that appeared to have improved the respective roadway performance: I-880/SR 92 Interchange Improvements and Eastbound I-580 HOV Lane.

These projects were under construction in 2010 but were completed when 2012 monitoring was performed:

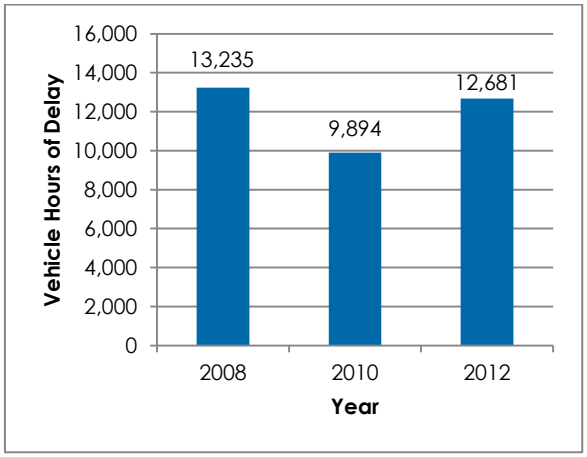
- Eastbound SR 92 near I-880 showed an estimated VHD of 1,980 in 2010, which was eliminated in 2012.
- Eastbound I-580 in East County showed an estimated VHD of 969 in 2012 compared to 4,328 in 2010, a reduction of 3,359 VHD.

These two projects alone contributed to a combined VHD reduction of 5,339, which is higher than the total VHD reduction of 3,544 experienced system-wide between 2010 and 2012 indicating that increased delay occurred on other parts of the CMP network.

VHD During the a.m. Peak Period

Similar to the p.m. peak period LOS F segments, VHD were estimated for the freeway segments operating at LOS F during the a.m. peak period. Chart 2 illustrates the estimated total VHD on LOS F freeway segments during the a.m. peak period for the past three LOS Monitoring cycles.

Chart 2: VHD in LOS F Segments During the a.m. Peak Period



The estimated total VHD on LOS F freeway segments during the a.m. peak period increased from 9,894 hours in 2010 to 12,681 hours in 2012, which is consistent with the general decreased speed experienced on the CMP network in 2012 as compared with 2010.

AVERAGE SPEEDS ON THE CMP NETWORK AND RELATIONSHIP TO JOBS AND VEHICLE MILES TRAVELED

Average speeds for the Tier 1 freeways and arterials during the p.m. peak period have been reported since 1991. The systemwide average speed statistics since 1991 for the Tier 1 network are shown in Appendix E-1.

Using the average speed data over the last 20 years, the long-term trend in performance of the CMP Tier 1 network was analyzed in terms of how it correlates with external factors that would influence commute travel (e.g., the economy) in Alameda County and more directly how it functioned with respect to the volume of traffic (i.e., vehicle miles traveled) on the CMP network. Unemployment was used as an indicator for the economy; it was based on data from the Bureau of Labor Statistics. Vehicle miles traveled (VMT) data was from the California Public Road Data published by Caltrans' based on its Highway Performance Monitoring System. Appendices E2 and E3 show the data for unemployment and VMT, respectively.

Chart 3 illustrates that a general correlation exists between the average speeds on the county freeways and the jobs in the Bay Area. When unemployment goes up (i.e., fewer jobs in the region), less traffic is expected to be on the road, thus average speed goes up. However, no correlation appears to exist between the average speeds on arterials and employment as shown in Chart 4. This also indicates the need to study the county arterials to better understand their performance.

Chart 3: Average Freeway Speeds and Unemployment

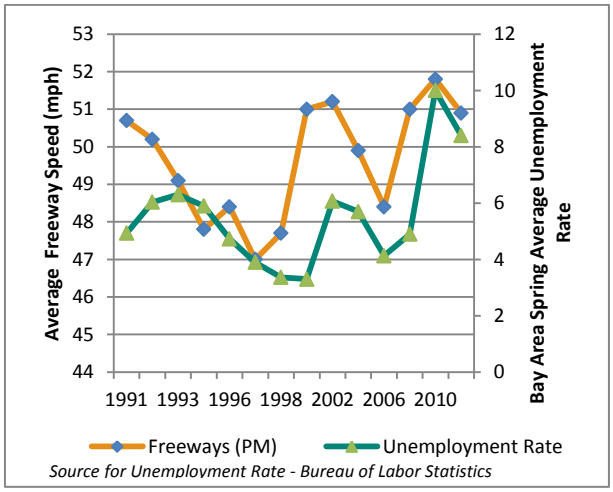
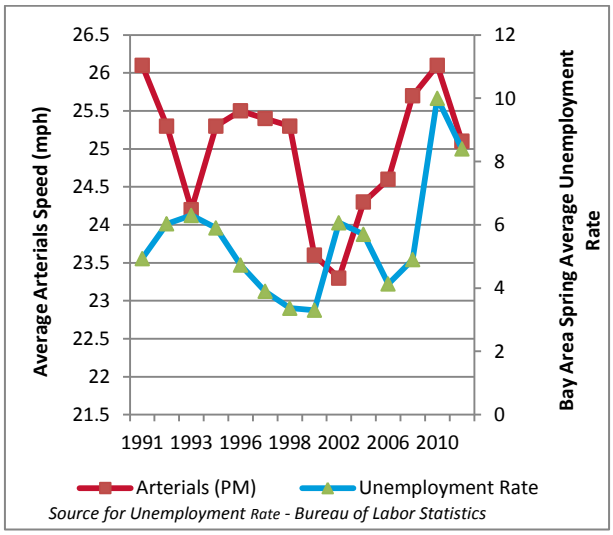
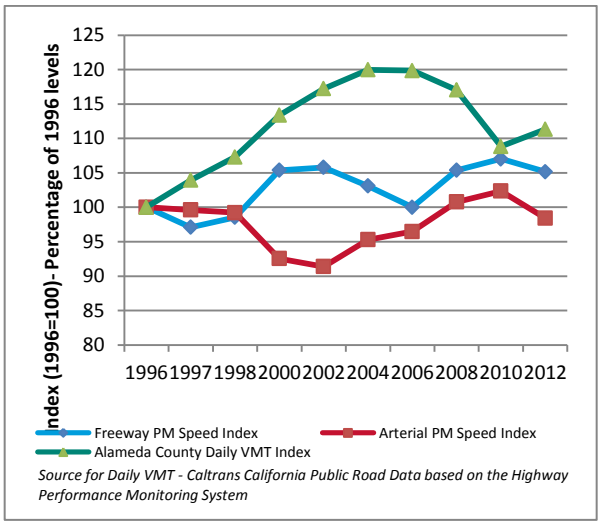


Chart 4: Average Arterial Speeds and Unemployment



Based on Caltrans' California Public Road Data, VMT on the Alameda County roadways increased from 32.8 million in 1996 to 36.5 million in 2011 (2011 data is the most recent estimation and is plotted for 2012 in the chart for ease of analysis). The highest throughput of 39.4 million VMT was experienced in 2004. Chart 5 illustrates that the speeds on the CMP roadways have been somewhat stable since 1996 fluctuating only within 10 percentage points despite the 20 percent increase experienced in VMT between 1996 and 2012. This could be the result of various congestion management activities undertaken in the county during this period through planning and implementation of various programs and projects.

Chart 5: Average Speeds on the CMP Roadways in the p.m. and Increased Road Usage



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5. MONITORING PROGRAM RESULTS AND NEXT STEPS

This section summarizes observations related to Conformity based on the 2012 LOS Monitoring results. It also takes the next step in reviewing the congested segments on the CMP network in both p.m. and a.m. peak periods, and identifies potential improvements for these segments in terms of improvement projects or studies either underway or planned; if not, whether the segment needs to be further investigated.

As presented in the prior sections of this report, congestion on the CMP network has increased in 2012 compared to 2010. It is shown in the increased number of LOS F segments from 2010 and decreased average speed on freeways and arterials. Some areas that showed improvements appear to be related to the improvement projects completed since 2010 after the LOS monitoring was completed. It is concluded that the congestion increase could be likely due to the economy that is beginning to show improvement combined with many construction activities occurring across the county.

Analysis of trend in performance since 1991 shows that congestion on the Alameda County CMP network is stable while VMT has increased. Further, as employment increases, freeway speed decreases resulting in a corresponding increase in congestion. The relationship between arterial congestion, speed and employment does not appear to be as clear, where speeds over time have not changed compared to the fluctuations in the economy (i.e., employment) over time, indicates a need for further study of arterials for a better understanding of countywide arterial performance.

CMP CONFORMITY

In order to meet the CMP legislative requirements, the Alameda County LOS Monitoring Study uses the results from the weekday p.m. peak period for Tier 1 roadways for CMP Conformity purposes. There were 39 CMP segments operating at LOS F conditions in 2012 during the p.m. peak period. Of these 39 segments, 20 were exempt from deficiency plan requirements because they were either grandfathered in the 1991 LOS surveys or impacted by construction, which is one of the applicable exemptions under the CMP legislation. Of the remaining 19 segments, four were functioning at LOS F for the first time and 15 were found at LOS F in previous surveys. Based on the select link analysis performed on these 19 LOS segments using the Alameda Countywide Travel Demand Model, no segments were identified as deficient in 2012 after applying the statutorily applicable exemptions.

POTENTIAL IMPROVEMENTS RELATED TO THE CONGESTED ROADWAYS

To improve the overall CMP network performance, the congested segments need to be analyzed and options for improvements need to be identified. There are many projects that are currently

underway or planned would potentially improve the congested segments. For the congested segments that appear to be new bottlenecks, potential causes for them will be investigated further.

Projects that are in progress or planned that would potentially improve the congested segments including their status are summarized below:

- LOS F conditions on I-80 segments in the vicinity of the Bay Bridge are probably due to construction on the Bay Bridge, which is anticipated to be completed by end of 2013. In addition to this regionally significant project, the I-80 ICM project implementation that is currently underway is also expected to improve the performance of the corridor upon completion.
- There are many projects under construction on or near I-880 including the I-880/5th Avenue Retrofit Project and I-880/High Street Retrofit Project in North County, and SR 238/Foothill Operational improvements in Central County. While the two projects on I-880 are scheduled to be completed by summer of 2014, SR 238/Foothill Operational Improvements is anticipated to be completed by summer 2013. It is expected that the general performance of the freeway will be improved once construction is completed.
- Congestion along I-680 northbound will likely be improved with the implementation of the HOV/HOT project that is currently in environmental phase.
- Conversion of the existing HOV lanes to HOT lanes along I-580 in East County is currently in environmental phase. Congestion experienced along eastbound I-580 in East County will likely be improved upon completion of this project.
- SR 84 eastbound from Pleasanton-Sunol Road to Vallecitos Nuclear Center entrance could be improved by projects identified in the SR 84 corridor including Tri-Valley Triangle Study. The proposed improvements include Caltrans SHOPP projects, which are safety related, and the addition of truck climbing lanes on Pigeon Pass.
- Performance of SR 24 is expected to be improved with the completion of Caldecott Tunnel 4th Bore Project, which is scheduled to be in late 2013.

Regarding new bottlenecks identified, they will be either investigated as part of an on-going study or future new study. Congestion along southbound I-680 between I-580 and Sunol Boulevard is being studied as part of the Express Lane Evaluation Study. Potential causes of other two bottlenecks, northbound I-880 between Alvarado Niles and A Street and eastbound I-580 between 1st Street and N. Flynn Road, will be investigated further.

Table 17 lists specific congested roadways and potential improvements either underway, planned, or being studied on those roadways. Also identified are the segments that are currently operating at LOS F where additional study is needed to determine the cause. For projects under construction, the level of improvement will be monitored in the next LOS monitoring cycle.

Table 17: Impacted Segments Showing LOS F in 2012 and Options for Potential Improvements

Name of Congested Roadway	Name of the Project or Study
Construction Underway or Completed Recently	
I-80 Segments	Bay Bridge construction and recently begun I-80 ICM project
SR 24 Segments	Caldecott Tunnel 4th Bore project
I-880 in the North and Central County	I-880/5th Avenue Retrofit I-880/High Street Improvements SR 238 (Foothill) Improvements
In Project Development Phase/Programmed/Planned/Being Studied	
I-880 Segments	I-880 Integrated Corridor Management
Northbound I-680	HOV/HOT lane implementation
Eastbound and Westbound I-580 in East County	HOV to HOT lane conversion Eastbound truck climbing lane
Southbound I-680 north of Sunol Eastbound SR 84 near Sunol	I-680 Express Lane Evaluation (After) Study
Eastbound SR 84 near Vallecitos Nuclear Center	Safety Improvements by Caltrans (SHOPP) Truck Climbing Lanes on Pigeon Pass Improvements identified in the Triangle Study Route 84 Express Way
To be Investigated	
Northbound I-880 congestion between Alvarado-Niles and A Street	Central and South County LATIP projects
Eastbound I-580 congestion between 1st Street and N. Flynn Road	Eastbound truck climbing lane

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APPENDICES

APPENDIX A: LEVEL OF SERVICE F SEGMENTS

A-1: Level of Service F Segments—P.M. Peak Period

A-2: Level of Service F Segments—A.M. Peak Period

APPENDIX B: 2012 LEVEL OF SERVICE RESULTS BY PLANNING AREA AND DATA COLLECTION PERIOD

B-1: 2012 P.M. Peak Period Level of Service Results, Planning Area 1 (Figure 3)

B-2: 2012 P.M. Peak Period Level of Service Results, Planning Area 2 (Figure 4)

B-3: 2012 P.M. Peak Period Level of Service Results, Planning Area 3 (Figure 5)

B-4: 2012 P.M. Peak Period Level of Service Results, Planning Area 4 (Figure 6)

B-5: 2012 A.M. Peak Period Level of Service Results, Planning Area 1 (Figure 7)

B-6: 2012 A.M. Peak Period Level of Service Results, Planning Area 2 (Figure 8)

B-7: 2012 A.M. Peak Period Level of Service Results, Planning Area 3 (Figure 9)

B-8: 2012 A.M. Peak Period Level of Service Results, Planning Area 4 (Figure 10)

B-9: 2012 Weekend Peak Period (1PM to 3PM) Level of Service Results, Countywide (Figure 11)

APPENDIX C: SEGMENTS AT LOS F IN 2010 AND NOT IN 2012

C-1: Segments at LOS F in 2010 and Not in 2012

APPENDIX D: COMPARISON OF P.M. PEAK PERIOD TRAVEL TIME DATA AND SPEED ON SELECTED CMP ROADWAYS

D-1: Comparison of P.M. Peak Period Travel-Time Data & Speed on Selected Freeway Routes

D-2: Comparison of P.M. Peak Period Travel-Time Data & Speed on Selected Arterial Routes

APPENDIX E: TREND ANALYSIS

E-1: Average Speeds on the CMP Network Observed During the LOS Monitoring Studies

E-2: Average Annual Bay Area Unemployment Rate by Percentage of Population

E-3: Average Daily VMT in Alameda County by Year

APPENDIX F: TRAVEL ROUTES FOR THE ALAMEDA COUNTY O-D PAIRS—P.M. PEAK PERIOD

F-1: Travel Routes for the Alameda County O-D Pairs— P.M. Peak Period

APPENDIX G: 2012 LOS MONITORING STUDY RESULTS—DETAILED DATA BY DATA COLLECTION PERIOD

G-1: 2012 LOS Monitoring Study Results for Freeways— P.M. Peak Period

G-2: 2012 LOS Monitoring Study Results for Arterials— P.M. Peak Period

G-3: 2012 LOS Monitoring Study Results for Ramps and Special Segments— P.M. Peak Period

G-4: 2012 LOS Monitoring Study Results for Freeways—A.M. Peak Period

G-5: 2012 LOS Monitoring Study Results for Arterials— A.M. Peak Period

G-6: 2012 LOS Monitoring Study Results for Ramps and Special Segments— A.M. Peak Period

G-7: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways— P.M. Peak Period

G-8: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways— A.M. Peak Period

G-9: 2012 LOS Monitoring Study Results for Freeways—Weekend Peak Period

APPENDIX A: Level of Service F Segments

Appendix A-1: Level of Service F Segments—p.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F (Years)	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
1	I-80 - EB	Toll Plaza	I-580 SB Merge	Oakland	1.15	'93-'02, '06, '08	275	Construction	C 54.2	F(30) 25.4	Tue 2/28 4:34 Thur 3/22 5:02 Tue 5/15 5:28 Wed 5/16 5:10	Thur 3/1 4:31 Wed 5/9 4:17 Wed 5/16 4:22
2	I-80 - EB	I-80/I-580 (Merge)	Powell	Emeryville - Berkeley	0.79	'91-'95, '97-'06, '08, '10	836	Grandfathered	F(20) 16.6	F(20) 13.0	Same As Above	
3	I-80 - EB	Powell	Ashby	Emeryville - Berkeley	0.67	'91-'95, '97-'06, '08, '10	778	Grandfathered	F(20) 11.68	F(20) 12.3	Same As Above	
4	I-80 - EB	Ashby	University	Emeryville - Berkeley	1.34	'91-'95, '97-'08	304		E 31.7	F(30) 25.7	Same As Above	
5	I-80 - EB	Jct I-580	Central	Berkeley-Albany	1.12	'91-'92, '96-'97, '02, '06-'08	186		E 39.1	F(30) 27.7	Same As Above	
6	I-80 - WB	Jct I-580	University	Berkeley-Albany	1.49	'10	206	Construction	F(30) 23.7	F(30) 28.7	Tue 2/28 4:01 Thur 3/22 4:40 Tue 5/15 5:07	Thur 3/1 4:01 Wed 5/9 4:03 Wed 5/16 4:43
7	I-80 - WB	University	Ashby	Emeryville - Berkeley	1.36	'91-'92, '94-'08, '10	428	Grandfathered /Construction	F(30) 24.7	F(30) 23.3	Same As Above	
8	I-80 - WB	Ashby	Powell	Emeryville - Berkeley	0.64	'91-'92, '94-'08, '10	508	Grandfathered /Construction	F(20) 16.6	F(20) 15.5	Same As Above	
9	I-80 - WB	Powell	I-80/I-580 Split	Emeryville - Berkeley	0.42	'91-'92, '94-'06	66	Construction	E 31.7	F(30) 28.0	Same As Above	
10	I-580 - EB	I-680	Hopyard	Pleasanton	0.76	'98-'02, '06-'08, '10	160		F(10) 8.7	F(30) 24.6	Thu 3/8 5:20 Wed 4/25 5:46 Wed 5/9 4:01 Thu 5/31 4:53	Thu 3/22 5:16 Thu 4/26 4:27 Thu 5/31 4:02 Wed 6/6 4:37

Appendix A-1: Level of Service F Segments—p.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F (Years)	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
11	I-580 - EB	Hopyard	Santa Rita	Pleasanton	1.96	'98-'02, '06-'08, '10	330		F(20) 10.8	F(30) 26.2	Same As Above	
12	I-580 - EB	1st St	Greenville	Livermore - County	1.98		195	New LOS F	B 56.0	F(30) 29.3	Wed 2/29 4:16 Wed 3/21 4:37 Tue 4/24 4:25 Thu 5/31 4:02 Wed 6/6 4:37	Thu 3/1 5:09 Thu 3/22 5:32 Wed 5/23 4:37 Thu 5/31 4:53
13	I-580 - EB	Greenville	N. Flynn	County	1.50		284	New LOS F	E 35.4	F(30) 25.4	Same As Above	
14	I-580 - EB	I-80	I-980	Oakland	1.24	'91-'92, '08-'10	551	Grandfathered	F(30) 25.7	F(20) 18.6	Tue 3/20 4:02 Thur 3/29 5:40 Thur 5/10 4:24	Tue 3/20 5:11 Wed 5/9 4:46 Thur 5/31 5:14
15	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oakland	0.69	'06	506	Construction	B 56.7	F(20) 14.2	Tue 3/20 4:35 Thur 3/29 4:33 Thur 5/10 5:18	Wed 3/21 4:00 Wed 5/9 5:32 Thur 5/24 4:01
16	I-680 - NB	Rt 262/ Mission	Durham Rd	Fremont	1.34	'08-'10	376		F(20) 16.5	F(30) 20.1	Tue 2/28 4:04 Thur 3/1 4:30 Thur 3/8 4:50 Thur 3/22 4:31	Wed 2/29 4:44 Wed 3/7 5:35 Thur 3/8 5:27
17	I-680 - NB	Durham Rd	Washington Blvd	Fremont	1.54	'08-'10	290		F(30) 20.4	F(30) 23.4	Same As Above	
18	I-680 - NB	Vargas Rd	Andrade Rd	County	2.64	'10	210		F(30) 28.1	F(30) 28.9	Same As Above	
19	I-880 – NB	Alvarado-Niles	Tennyson	Union City - Hayward	2.65	'00-'02, '06-'08, '10	557		F(20) 17.7	F(30) 24.7	Wed 2/29 4:43 Wed 3/7 4:03 Wed 3/21 4:04 Wed 5/9 4:48	Thur 3/1 4:03 Tue 3/20 4:50 Tue 5/8 5:17 Thur 5/17 4:16

Appendix A-1: Level of Service F Segments—p.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F (Years)	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
20	I-880 - NB	Tennyson	SR 92	Hayward	1.14	'91-'92	473		E 37.7	F(20) 19.2	Wed 2/29 4:43 Tue 3/6 4:33 Wed 3/7 4:03 Wed 5/23 5:19	Thur 3/1 4:03 Tue 3/6 5:47 Thur 5/17 4:16
21	I-880 - NB	SR 92	A St	Hayward	1.52	'91-'92	283		E 38.4	F(30) 25.5	Same As Above	
22	I-880 - NB	I-880/I-80 Split	I-880/I-80 Merge	Oakland	1.40		922	New LOS F	E 31.5	F(20) 15.2	Tue 3/6 4:43 Tue 3/20 5:27 Thur 5/17 4:55	Wed 3/7 4:01 Wed 3/21 4:00 Wed 5/23 5:19
23	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oakland	1.57	'06-'10	335	Construction	F(30) 24.2	F(20) 18.9	Wed 2/29 4:38 Thur 3/22 4:01 Tue 5/8 5:12	Wed 3/21 5:09 Tue 5/8 4:24 Tue 5/22 4:12
24	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oakland	0.89	'08-'10	278		F(20) 12.5	F(20) 15.6	Wed 2/29 4:07 Tue 5/8 4:48 Tue 5/22 4:04	Wed 3/21 4:37 Tue 5/15 4:02 Thur 6/7 5:09
25	SR 24 - EB	Jct I-580 (On-ramp)	Broadway / SR 13	Oakland	2.08	'91-'97, '02, '06, '08, '10	1240	Grandfathered/ Construction	F(20) 15.8	F(20) 16.0	Wed 3/7 5:09 Wed 3/21 4:34 Tue 5/8 4:16 Thur 6/7 4:01	Thur 3/8 5:15 Wed 3/21 5:02 Tue 5/8 5:36
26	SR 24 - EB	Broadway / SR 13	Caldecott (Entrance)	Oakland	1.41	'91-'97, '02, '06, '08, '10	1054	Grandfathered/ Construction	F(20) 14.5	F(20) 14.1	Same As Above	
27	SR 84 - EB	Newark Blvd/ Ardenwood	I-880 NB (Off-ramp)	Newark	0.97	'08, '10	413		F(30) 26.9	F(20) 16.4	Tue 2/28 4:27 Tue 3/6 5:03 Thur 3/22 4:37	Thur 3/1 5:19 Wed 3/7 5:36 Wed 5/16 5:17

Appendix A-1: Level of Service F Segments—p.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F (Years)	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
28	A Street – EB	Western	SR 238	Hayward	0.53			New LOS F/ Construction	E 7.6	F 5.2	Tue 3/27 5:13 Tue 5/22 5:19 Thur 5/24 4:10	Tue 3/27 5:50 Wed 5/23 4:16 Wed 5/30 4:01
29	Hesperian – NB	Grant	Lewelling	County	0.28	'00, '04, '06-'10		Construction	F 8.1	F 6.9	Wed 3/7 4:02 Wed 3/21 4:58 Thur 5/10 4:34 Tue 5/15 5:05	Thu 3/8 4:03 Thu 3/22 4:02 Tue 5/15 4:02
30	Hesperian - SB	Springlake	Lewelling	County	0.40	'00-'10		Construction	F 8.1	F 7.9	Tue 3/6 5:39 Wed 3/21 4:23 Thur 5/10 4:02 Tue 6/5 4:46	Wed 3/7 5:21 Wed 3/21 5:29 Thur 5/10 5:07
31	Hesperian - SB	SH 92 - WB	Tennyson	Hayward	0.47	'08-'10		Construction	F 11.0	F 11.7	Wed 3/7 5:21 Wed 3/21 5:29 Thur 5/10 5:07	Wed 3/21 4:23 Thur 5/10 4:02
32	University - WB	Sacramento	San Pablo	Berkeley	0.56			New LOS F	E 12.6	F 9.9	Wed 4/18 5:09 Wed 5/2 4:37 Thur 5/17 5:32 Tue 6/5 4:02	Tue 4/24 4:37 Thur 5/17 5:10 Tue 5/22 4:46
33	SR 84 - EB	Sunol Rd	Pleasanton -Sunol Rd	Fremont	0.53	'10			F 4.7	F 4.8	Tue 2/28 5:30 Wed 3/21 4:43 Thur 5/10 4:05	Tue 3/6 4:06 Thur 3/22 4:01 Thur 5/10 5:04
34	SR 84 - EB	SR 84 (Off-ramp)/I-680	Vallecitos Ln	County	1.07	'02-'04, '06-'10			F 11.7	F 13.6	Tue 2/28 4:38 Thur 3/1 4:37 Tue 3/20 4:57	Wed 2/29 5:17 Tue 3/6 4:48 Tue 3/20 5:40
35	SR 92 - EB	I-880	Mission	Hayward	1.59	'91-'92		Construction	D 15.4	F 6.9	Wed 2/29 5:22 Thur 3/8 5:07 Thur 3/29 4:22	Tue 3/6 5:43 Wed 3/28 5:07 Tue 5/22 5:30

Appendix A-1: Level of Service F Segments—p.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F (Years)	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
											Wed 6/6 4:43	
36	SR 123 San Pablo – NB	Allston	University	Berkeley	0.20	'98, '00, '06, '10			F 5.8	F 5.4	Tue 4/17 4:36 Wed 5/23 4:00 Wed 5/30 4:46	Wed 5/16 4:56 Wed 5/30 4:00 Thur 5/31 4:01
37	SR 185 (14th) – NB	46th St.	42nd	Oakland	0.26	'08-'10		Construction	F 7.3	F 8.7	Tue 3/6 3:59 Wed 5/9 4:08 Wed 5/30 4:27 Wed 6/6 5:19	Wed 3/7 4:53 Wed 5/9 5:17 Wed 5/30 5:25 Thur 6/7 4:31
38	SR 238 (Foothill) - NB	Jackson	City Center	Hayward	0.62			New LOS F/ Construction	C 17.3	F 6.4	Wed 3/7 4:01 Wed 5/23 5:08 Tue 6/5 4:40 Thur 6/7 4:12	Thur 3/22 4:57 Wed 5/30 4:26 Wed 6/6 4:16
39	SR 13/ SR 24 Interchange	SR-13 NB	SR-24 EB	Oakland	0.32	'92-'10	145	Grandfathered/Construction	F 9.8	F 7.6	Tue 3/27 4:03 Tue 6/5 5:52	Tue 3/27 4:13 Thur 6/7 4:18

Notes:

- Vehicle Hours of delay estimation assumes a congested speed of 35 mph or less and freeway lane capacity of 2,200 vplph consistent with Caltrans' and MTC's assumptions.

Appendix A-2: Level of Service F Segments—a.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F Delay	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
1	I-80 - WB	Central	Jct I-580	Berkeley-Albany	0.70	'08	239	Construction	D 44.1	F(30) 22.7	Thur 3/22 7:02 Wed 4/25 7:02 Wed 5/16 7:01 Thur 5/17 7:30	Thur 3/22 7:58 Wed 4/25 7:47 Wed 5/16 7:44
2	I-80 - WB	Jct I-580	University	Berkeley-Albany	1.49	'08	382	Construction	E 37.0	F(30) 24.9	Same As Above	
3	I-80 - WB	I-80/580 Split	Toll Plaza	Oakland	1.20	'97-'10	3675	Construction	F(10) 8.7	F(10) 6.0	Same As Above	
4	I-80 - WB	Toll Plaza	SF County	Oakland	2.00	'97-'10	1211	Construction	F(10) 14.4	F(20) 17.8	Same As Above	
5	I-238 - WB	I-580	I-880	County - San Leandro	1.60	'97-'08	411		E 35.0	F(30) 20.8	Thur 3/8 8:00 Thur 3/22 8:47 Wed 5/2 7:11 Wed 5/9 7:31	Thur 3/22 8:24 Thur 3/29 7:18 Wed 5/2 7:37 Tue 6/5 7:02
6	I-580 - WB	Greenville	1st St	Livermore - County	2.30	'04, '08, '10	542		E 34.0	F(30) 23.8	Thur 3/1 7:27 Tue 3/20 8:48 Wed 4/25 7:02 Thur 5/3 8:12 Thur 6/7 7:48	Tue 3/6 8:34 Wed 3/21 7:23 Thur 5/3 7:18 Tue 6/5 8:02
7	I-580 - WB	1st St	Portola	Livermore	2.52	'08, '10	721		E 34.0	F(30) 22.3	Same As Above	
8	I-580 - WB	SH 13 Off-ramp	Fruitvale	Oakland	2.36	'08-'10	384		F(20) 21.9	F(30) 26.4	Tue 3/20 7:28 Thur 4/26 7:01 Thur 5/17 7:03	Tue 3/20 8:32 Wed 5/2 7:52 Wed 6/6 7:32
9	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oakland	0.69	'02, '06-'10	371	Construction	F(20) 12.9	F(20) 16.9	Tue 3/20 7:36 Thur 4/26 7:09 Thur 5/10 8:06 Wed 6/6 7:40	Tue 3/20 8:40 Wed 5/2 8:01 Thur 5/17 7:10

Appendix A-2: Level of Service F Segments—a.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F Delay	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
10	I-580 - EB	Central	I-80 Jct	Albany	0.77		110	Construction	E 32.2	F(30) 27.3	Tue 3/20 7:1 Wed 4/25 8:37 Wed 5/2 7:25 Wed 5/16 8:34	Tue 3/20 8:02 Thur 4/26 7:25 Wed 5/2 8:27 Thur 5/17 8:11
11	I-680 - SB	Bernal	Sunol	County	1.31		136	New LOS F	D 43.9	F(30) 27.5	Wed 2/29 7:31 Wed 3/7 8:01 Thur 3/8 8:37 Wed 3/21 8:21	Thur 3/1 7:54 Thur 3/8 7:04 Tue 3/20 7:09
12	I-880 - NB	Marina Blvd	SR 112/ Davis	Oakland - San Leandro	0.79	'10	67		F(30)2 5.9	F(30)3 0.0	Thur 3/1 8:19 Wed 3/7 7:03 Thur 4/26 7:51 Tue 6/5 8:30	Tue 3/6 7:34 Wed 3/7 8:19 Thur 5/17 7:20 Wed 6/6 8:04
13	I-880 - NB	SR 112/ Davis	Hegenberger	Oakland - San Leandro	1.88		164	New LOS F	E 31.7	F(30) 29.8	Same As Above	
14	I-880 - SB	I-238	A St	San Leandro - County	2.03	'06-'10	577		F(20) 18.0	F(30) 22.4	Tue 3/6 7:11 Wed 3/7 7:02 Thur 4/26 7:25 Wed 6/6 7:01	Tue 3/6 8:27 Thur 3/8 7:06 Thur 4/26 8:35 Wed 6/6 8:22
15	I-880 - SB	SR 92	Tennyson	Hayward	0.96		252	New LOS F	E 39.5	F(30) 23.0	Same As Above	
16	I-880 - SB	Tennyson	Alvarado-Niles	Hayward - Union City	2.49	'00	616		F(30) 29.4	F(30) 23.5	Wed 3/7 7:20 Tue 3/20 8:12 Tue 5/1 7:26 Wed 6/6 7:17	Thur 3/8 7:24 Thur 4/26 7:56 Thur 5/24 8:10 Wed 6/6 8:34
17	I-880 - SB	Alvarado-Niles	Alvarado	Union City - Fremont	1.37	'10	290		F(30) 26.1	F(30) 24.6	Same As Above	
18	I-880 - SB	Alvarado	Decoto	Union City - Fremont	1.17		180	New LOS F	E 33.0	F(30) 26.8	Same As Above	

Appendix A-2: Level of Service F Segments—a.m. Peak Period

	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Prior LOS F Delay	Vehicle Hrs of Delay	Comments	LOS Results		Run details	
		From	To						2010	2012		
19	I-880 - SB	Decoto	Stevenson	Fremont	4.07	'10	1505	New LOS F	F(30) 28.4	F(30) 20.2	Same As Above	
20	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oakland	1.57	'06-'10	202	Construction	F(30) 28.8	F(30) 23.2	Wed 3/21 7:24 Tue 5/1 7:41 Thur 5/3 8:03	Wed 3/21 8:05 Thur 5/3 7:19
21	SR 24 - EB	Broadway /SR 13	Caldecott (Entrance)	Oakland	1.41	'08-'10	649	Construction	F(30) 20.1	F(20) 18.3	Wed 3/7 8:15 Wed 3/21 7:34 Tue 5/1 8:08	Thur 3/8 8:41 Wed 3/21 7:55 Thur 5/24 7:02
22	Hesperian - NB	Grant	Lewelling	County	0.28	'10		Construction	F 10.0	F 9.9	Thur 3/8 7:08 Thur 5/3 8:35 Tue 5/8 8:01	Tue 5/1 7:45 Tue 5/8 7:01 Tue 5/22 7:08
23	SR 84/ Fremont - WB	Peralta	Thornton	Fremont	0.33			New LOS F	F 9.8	F 9.5	Thur 3/1 7:13 Thur 3/8 8:51 Thur 3/22 7:38 Thur 4/26 7:15 Wed 5/2 7:51	Tue 3/6 7:46 Wed 3/21 8:53 Wed 4/25 8:18 Wed 5/2 7:13 Thur 5/3 7:05
24	SR 84 - EB	Sunol Rd	Pleasanton-Sunol Rd	Fremont	0.53			New LOS F	D19.2	F9.3	Wed 2/29 8:40 Thur 3/8 8:07 Thur 3/22 7:10	Tue 3/6 7:15 Wed 3/21 8:22 Wed 4/25 7:27
25	SR 84 - WB	Ruby Hill / Kaithoff	Culvert (Lat/Long 37.613854,-121.817224)	Pleasanton	1.62			New LOS F	B 47.4	F 18.1	Thur 3/1 8:03 Tue 3/20 7:01 Wed 5/16 7:48	Tue 3/6 7:20 Wed 3/21 7:04 Wed 5/16 8:38
26	SR 185 (14th) - NB	46th St.	42nd	Oakland	0.26			Construction	F 7.2	F 8.8	Wed 2/29 8:43 Wed 5/2 7:59 Thur 5/10 8:28	Wed 5/2 7:28 Wed 5/9 7:49
27	1-880/ SR 260 Connection	SR-260 EB	I-880 NB	Oakland	0.36			New LOS F	E 18.8	F 15.5	Wed 3/7 8:13 Tue 5/1 8:06 Thur 6/7 8:24	Wed 4/25 7:38 Wed 6/6 8:47 Wed 6/6 8:50

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APPENDIX B: 2012 Level of Service Results by Planning Area and Data Collection Period

*LOS will be estimated later based on Free Flow Speed Survey

ALAMEDA County Transportation Commission

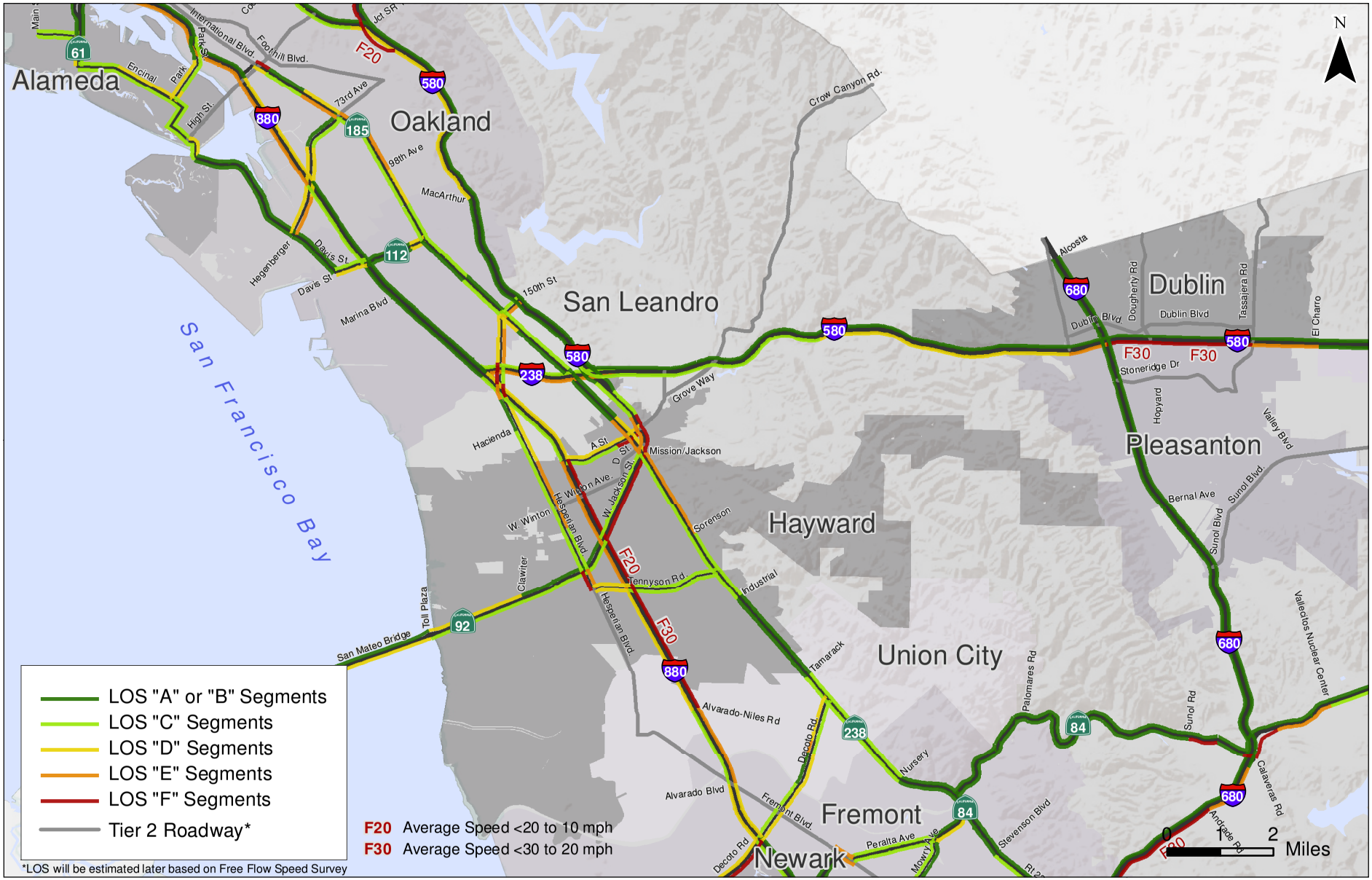
2012 PM Peak Period Level of Service Results
Planning Area 1

Figure **3**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\03_2012 PM Peak Period LOS Results Planning Area 1.mxd - ddepencier - 4:46 PM 7/16/2012



2012 PM Peak Period Level of Service Results
Planning Area 2

Figure **4**

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

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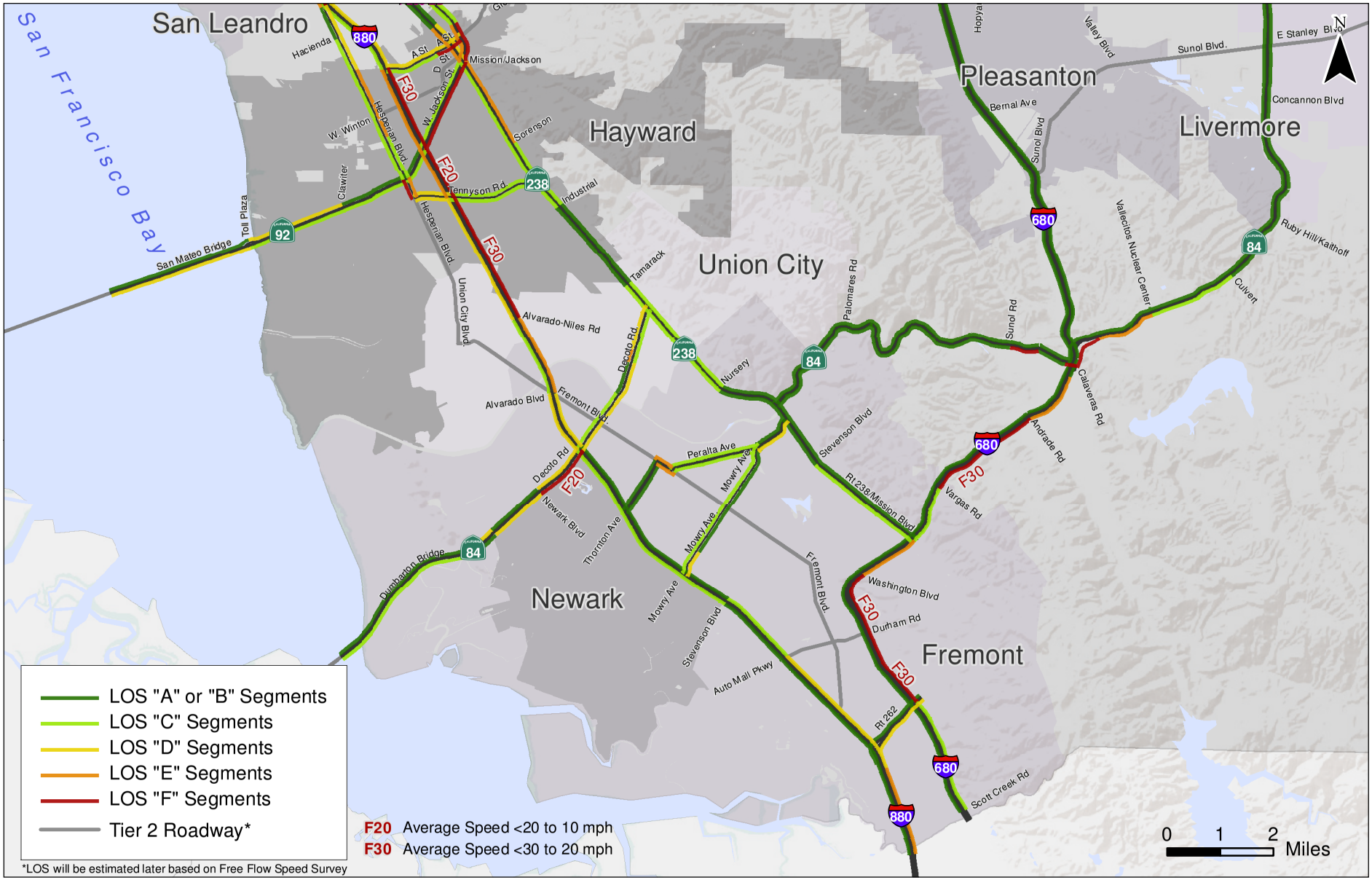
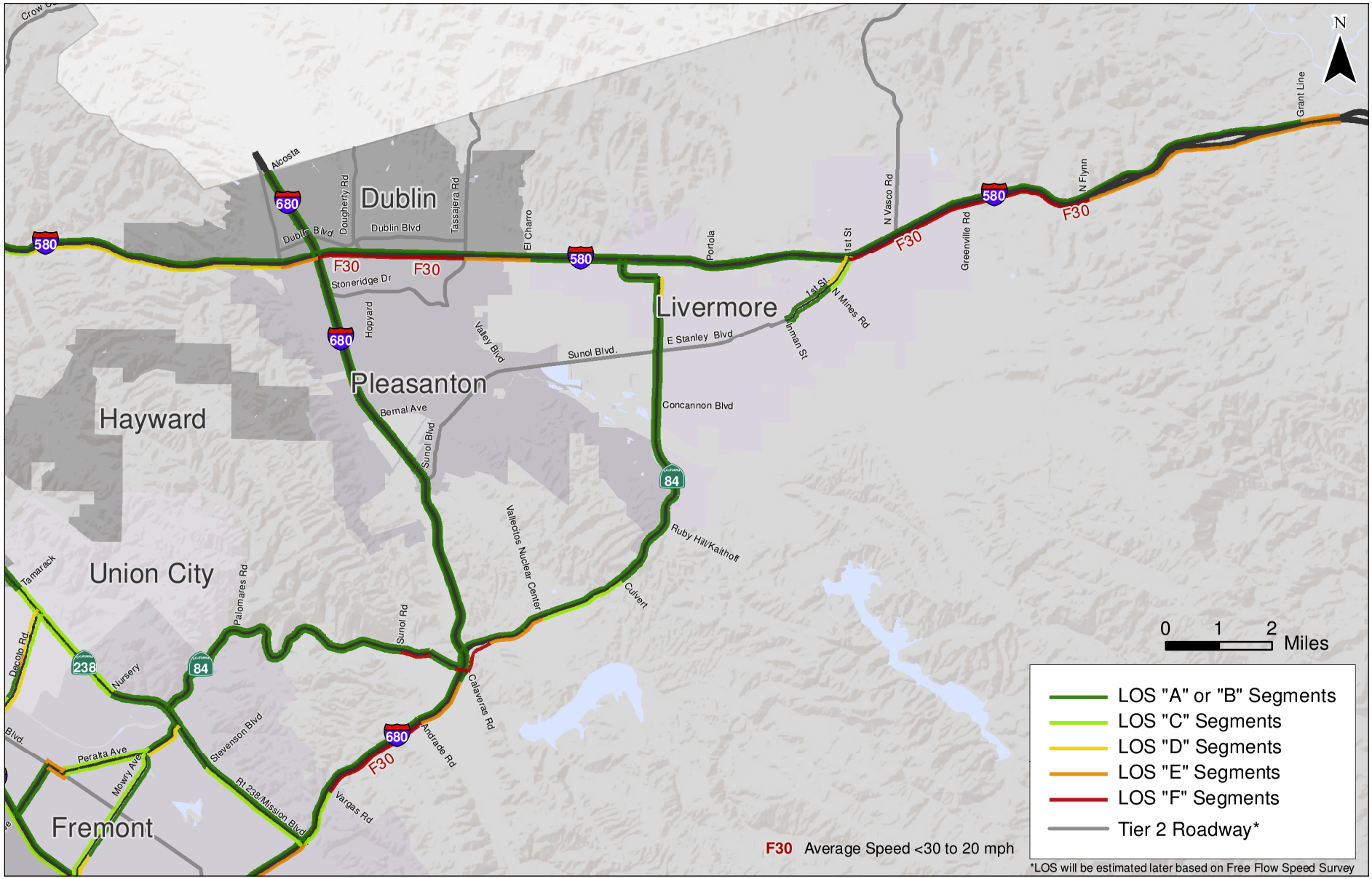


2012 PM Peak Period Level of Service Results
Planning Area 3

Figure **5**

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet



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2012 PM Peak Period Level of Service Results
Planning Area 4

Figure **6**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\06_2012 PM Peak Period LOS Results Planning Area 4.mxd - ddepencier - 8:50 AM 7/16/2012

*LOS will be estimated later based on Free Flow Speed Survey

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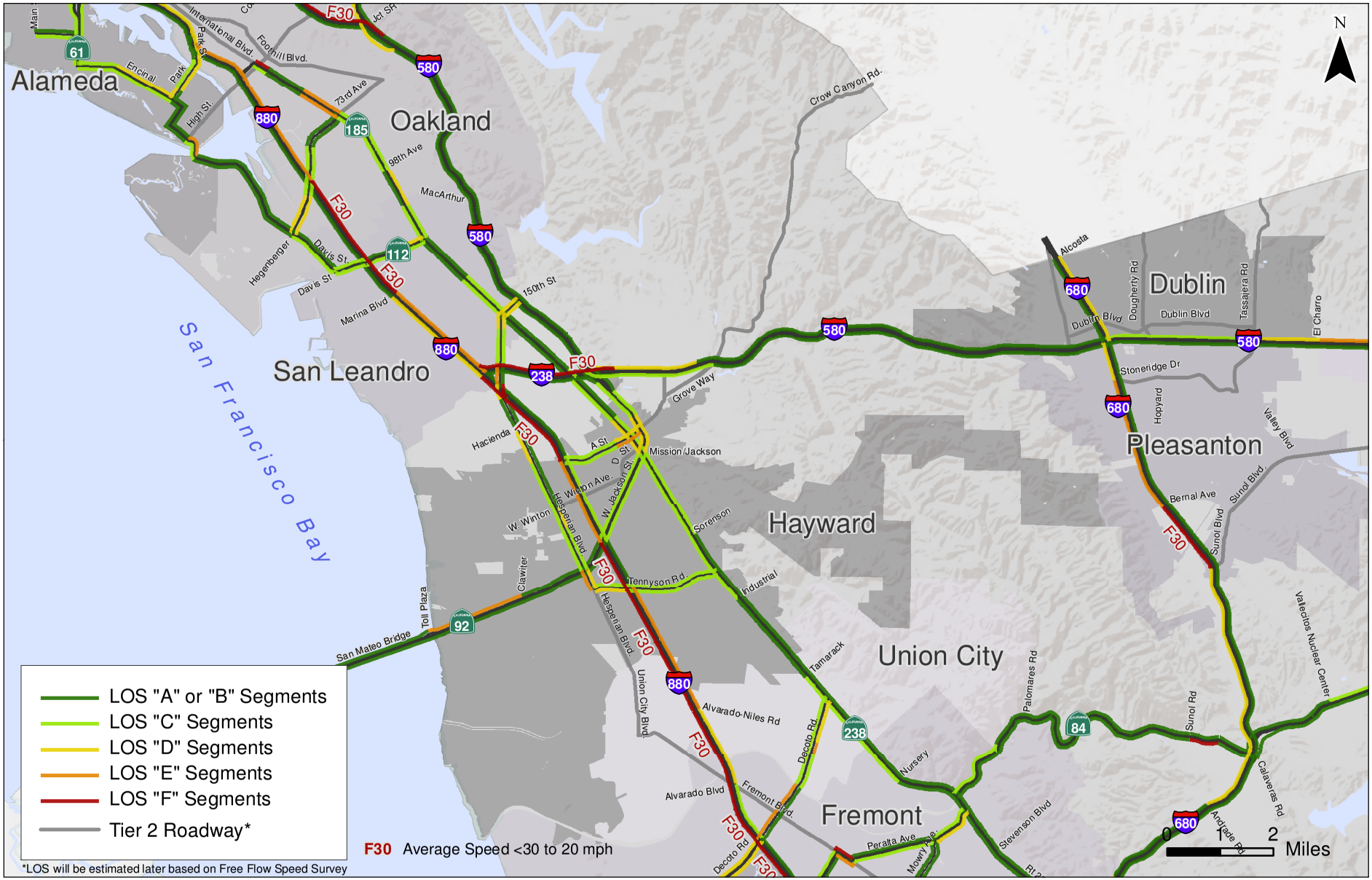
2012 AM Peak Period Level of Service Results
Planning Area 1

Figure **7**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\07_2012 AM Peak Period LOS Results Planning Area 1.mxd - ddepencier - 4:42 PM 7/16/2012



2012 AM Peak Period Level of Service Results
Planning Area 2

Figure **8**

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\08_2012 AM Peak Period LOS Results Planning Area 2.mxd - ddepencier - 8:52 AM 7/16/2012

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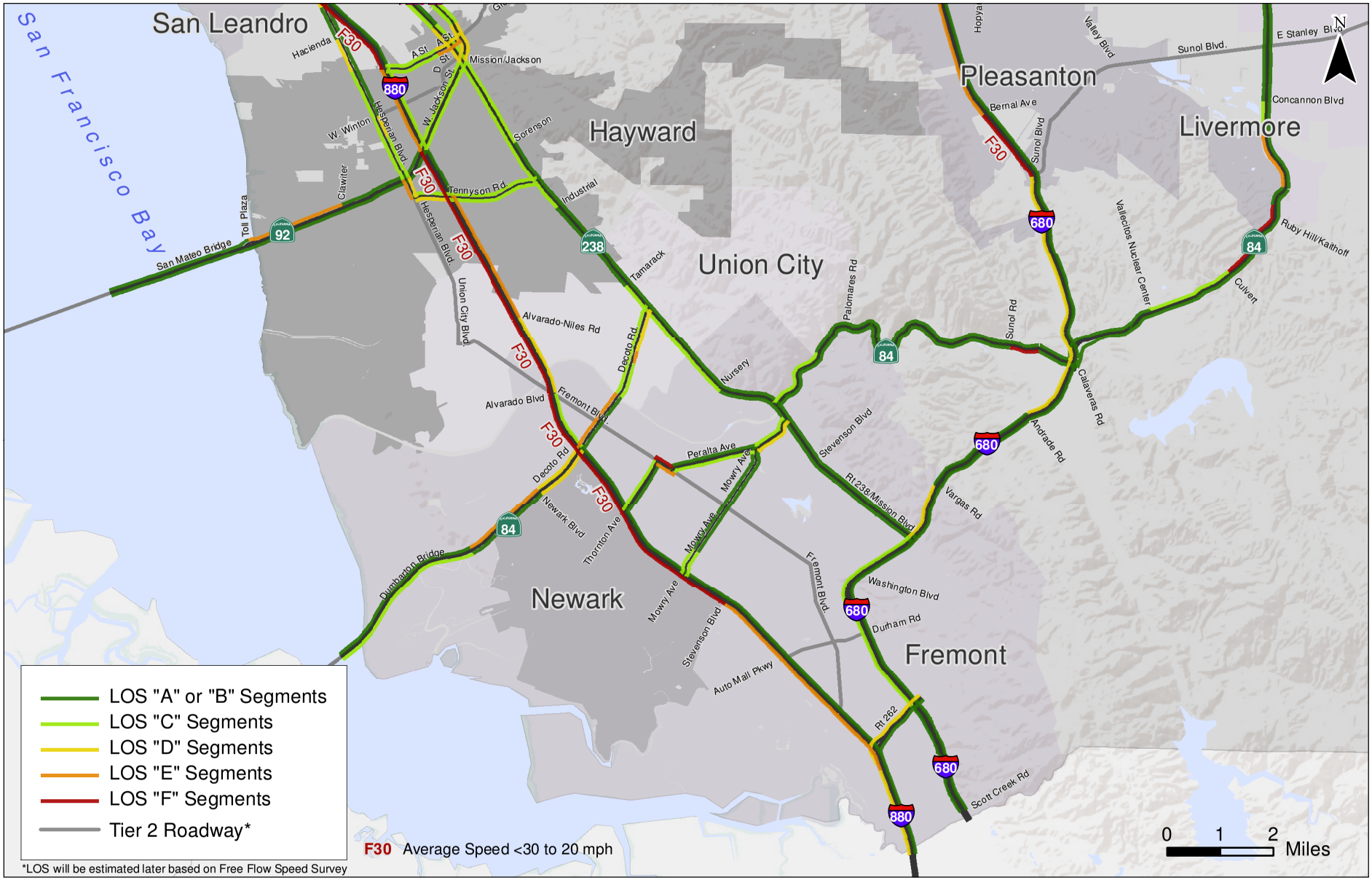
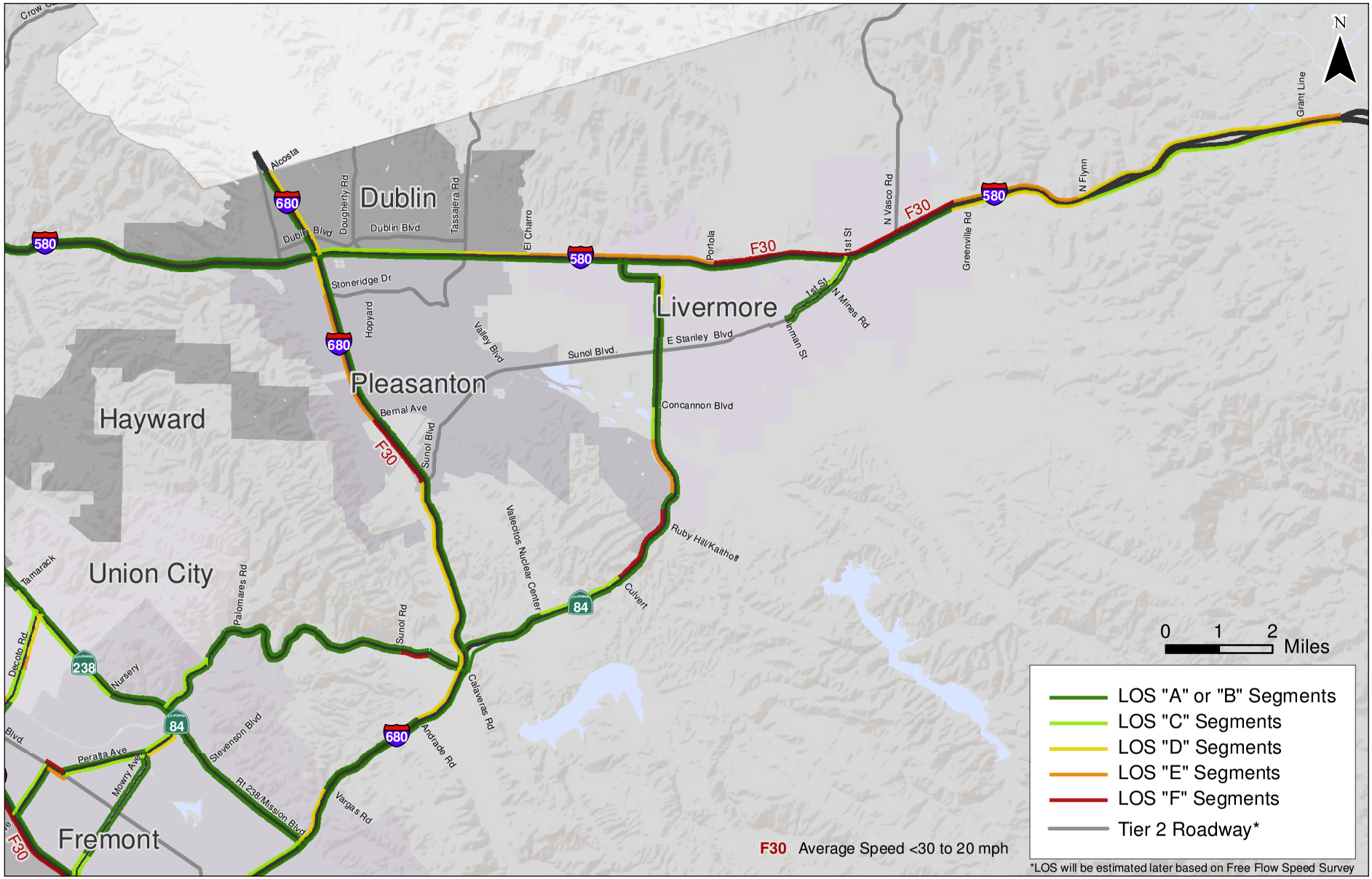
TRANSPORTATION ENGINEERING/PLANNING



2012 AM Peak Period Level of Service Results
Planning Area 3

Figure
9

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet



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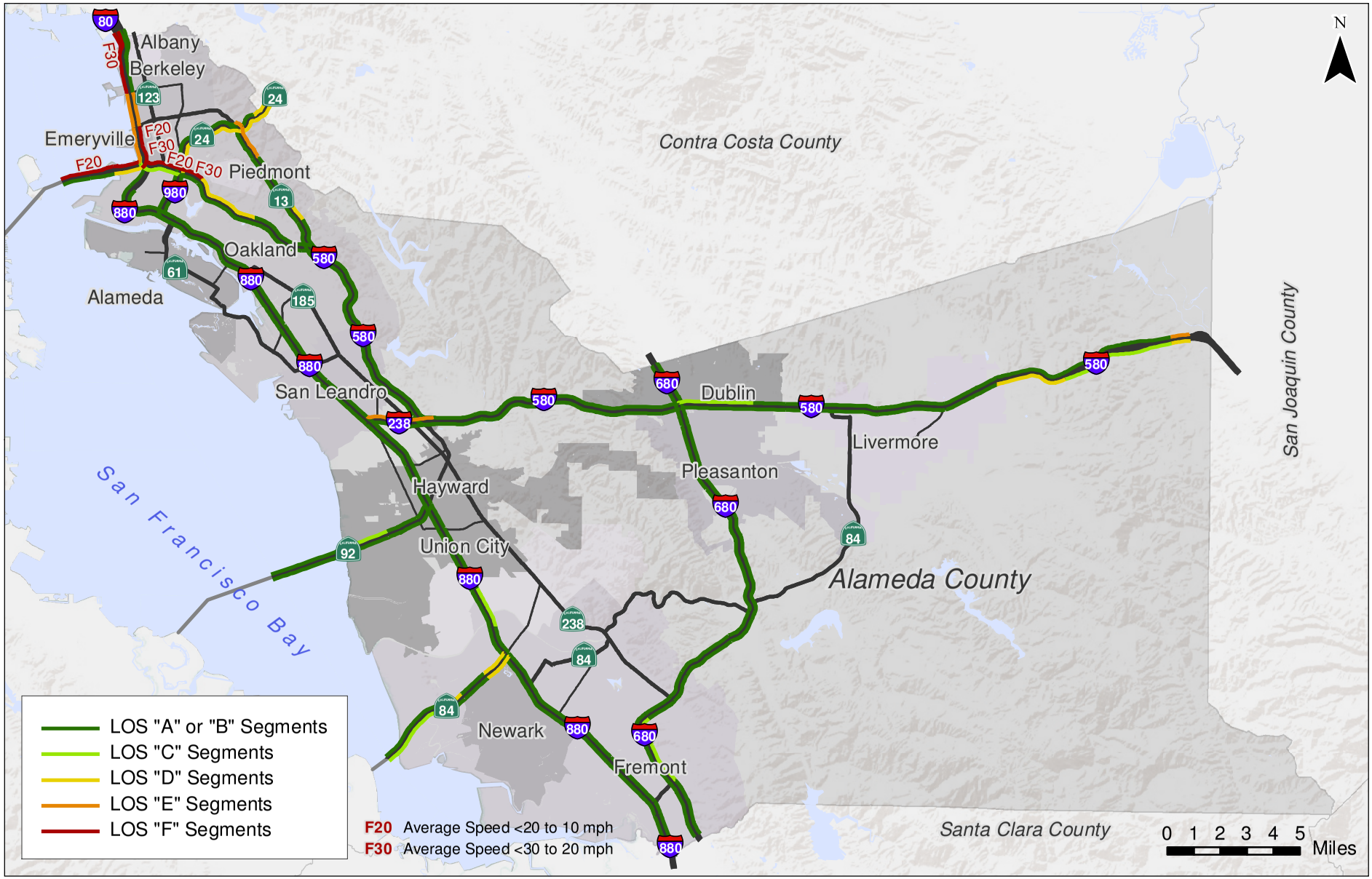
2012 AM Peak Period Level of Service Results
Planning Area 4

Figure **10**

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\10_2012 AM Peak Period LOS Results Planning Area 4.mxd - ddepencier - 8:54 AM 7/16/2012



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2012 Weekend Peak Period (1PM to 3PM) Level of Service Results Countywide

Figure **11**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

C:\Work\Projects\17144 - Alameda County Model P09\gis\2012 LOS\11_2012 Weekend LOS Results Freeway Facilities .mxd - ddepencier - 8:55 AM 7/16/2012

APPENDIX C: Segments at LOS F in 2010 and Not in 2012

Appendix C-1: Segments at LOS F in 2010 and not in 2012

	CMP Route	Segment Beginning	Segment Ending	Jurisdiction	2010 LOS (Speed)	2012 LOS (Speed)	Prior LOS F (Years)
P.M. PEAK PERIOD							
1	I-580 - EB	San Ramon/ Foothill	I-680	County - Pleasanton	**F20 (13.6)**	E (33.2)	'08, '10
2	I-580 - EB	Santa Rita	El Charro	County - Pleasanton	**F30 (22.3)**	E (34.1)	'02, '08, '10
3	I-580 - EB	Harrison	Lakeshore	Oakland	**F30 (27.0)**	E (31.2)	'08-'10
4	I-580 - EB	Coolidge	SH 13 Off-ramp	Oakland	**F30 (31.4)**	C (52.1)	'10
5	I-880 - NB	Decoto	Alvarado Blvd	Fremont - Union City	**F30 (28.6)**	D (42.8)	'02, '10
6	I-880 - NB	Alvarado Blvd	Alvarado-Niles	Fremont - Union City	**F30 (26.8)**	E (39.2)	'02, '10
7	I-980 - EB	I-880	SR 24 @ I-580	Oakland	**F30 (29.7)**	E (39.4)	'91
8	SR 92 - EB	Clawiter	I-880	Hayward	**F20 (10.0)**	C (54.4)	'91-'92, '94-'95, '97-'02, '06-'10
9	Hesperian - NB	La Playa	W. Winton Ave.	Hayward	**F (5.6)**	E (11.6)	'92, '08-'10
10	SR 13 Ashby - EB	College	Domingo	Berkeley	**F (6.5)**	E (7.7)	'91, '00, '04, '10
11	I-880/SR 260 Connection	SR-260 - EB	I-880 - NB	Oakland	**F (15.7)**	E (17.5)	'98, '08-'10
A.M. PEAK PERIOD							
12	I-880 - NB	Alvarado-Niles	Tennyson	Union City - Hayward	**F30 (24.8)**	E (38.1)	'06-'10
13	I-880 - NB	High/42nd	23rd (1st On-ramp)	Oakland	**F30 (29.4)**	E (33.2)	'10
14	I-880 - SB	A St	SR 92	Hayward	**F30 (25.1)**	E (34.1)	'97, '98, '00-'02, '08-'10
15	SR 84 - WB	Paseo Padre Pkwy	Toll Plaza	Newark - Fremont	**F30 (22.1)**	E (31.0)	'10

APPENDIX D: Comparison of P.M. Peak Period Travel-Time Data and Speed on Selected CMP Roadways

Appendix D-1: Comparison of p.m. Peak Period Travel-Time Data & Speed on Selected Freeway Routes (1991-2012)

CMP Route	Dir	From	To	Length (miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012
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
					23.5	20.4	21.7	20.8	20.2	26.6	19.3	31.6	23.1	20.9	28.5	22.07
	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
					25.3	23.7	23.3	24.6	28.0	17.6	22.2	27.8	27.7	36.2	27.2	25.89
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
					56.3	55.0	55.1	55.0	n/a	40.5	30.5	34.1	36.8	34.5	30.8	40.42
	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
					57.2	55.6	55.1	55.0	n/a	55.0	54.5	60.2	58.6	61.4	65.6	64.68
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	24:26	19:27	22:55	22:07
					52.6	51.8	44.0	53.2	60.0	62.7	54.7	42.8	39.3	47.0	41.8	40.55
	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
					57.7	55.5	51.0	52.2	61.2	62.8	59.5	56.6	55.2	62.6	59.9	53.86
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
					58.1	56.7	56.7	52.2	50.5	58.2	51.4	41.8	52.9	43.4	40.1	41.82
	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
					59.0	58.1	54.9	60.6	66.8	63.2	61.6	65.7	58.5	63.4	65.9	65.56
I-880	NB	Dixon	I-980	31.41	40:49	41:15	42:37	50:26	49:21	41:26	50:20	38:23	41:50	43:10	44:20	44:19

Appendix D-1: Comparison of p.m. Peak Period Travel-Time Data & Speed on Selected Freeway Routes (1991-2012)

CMP Route	Dir	From	To	Length (miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012
		Landing			44.8	44.4	42.9	45.5	38.8	47.5	37.5	49.1	44.6	43.2	42.1	42.12
	SB	I-980	Dixon Landing	30.85	41:55	44:41	47:36	40:31	37:19	40:48	45:46	45:57	49:53	38:53	40:06	37:59
					43.0	40.4	37.9	45.8	49.7	49.1	40.5	38.6	37.1	47.6	46.2	48.14
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
					53.6	49.9	48.5	48.1	53.2	50.9	50.4	34.6	38.8	51.0	41.3	35.12
	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
					56.4	59.4	52.5	47.2	59.1	59.5	54.6	54.1	48.7	49.0	39.4	57.2
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
					30.1	29.2	29.8	24.3	38.9	33.4	21.4	39.9	25.5	23.5	17.5	17.47
	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
					54.0	58.0	54.0	50.0	60.0	57.0	60.5	58.7	58.8	58.4	66.6	65.54

Appendix D-2: Comparison of p.m. Peak Period Travel-Time Data & Speed on Selected Arterial Routes (1991-2012)

CMP Route	Dir	From	To	Length (Miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012
Hesperian	NB	Tennyson	14th St.	5.5	19:35	19:19	18:40	16:06	17:18	18:10	22:00	22:10	24:55	25:09	22:04	23:33
					17.2	17.5	18.1	20.5	19.5	17.3	15.3	14.9	13.4	13.4	14.8	14.32
	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
					19.4	20.9	19.1	20.7	20.7	19.5	19.3	19.1	18.5	16.4	15.5	16.78
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
					14.7	16.9	16.5	16.5	15.6	13.4	15.0	13.5	14.4	16.0	16.0	13.9
	WB	Hiller	I-80	3.8	14:13	13:09	13:49	15:09	14:06	14.22	16:36	15:27	14:00	13:29	14:30	16:14
					16.0	17.2	16.4	15.0	16.1	15.9	13.8	14.7	16.3	16.9	15.7	14.0
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
					24.9	25.0	24.5	23.1	23.9	29.4	23	21.6	24.2	26.1	23.4	22.62
	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
					24.3	25.5	25.5	24.1	23.4	25.6	24.1	22.3	23.3	26.9	24.7	23.88
SR 84 Fremont	WB	SR-238	I-880 SB	4.3	10:07	8:27	10:56	10.27	11:42	10:23	11:33	9:48	9:49	9:51	10:33	9:41
					25.0	30.5	23.5	24.1	22.0	24.9	22.3	26.3	26.29	26.2	23.1	25.14
	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
					24.3	24.8	21.9	18.7	19.9	16.6	21.5	24.1	22.47	22.9	20.1	20.7
SR 84	WB	I-580 WB	Isabel	*5.23	9:20	10:36	9:27	11:03	11:01	10:20	10:45	5:30	7:43	7:25	7:51	7:54

Appendix D-2: Comparison of p.m. Peak Period Travel-Time Data & Speed on Selected Arterial Routes (1991-2012)

CMP Route	Dir	From	To	Length (Miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012
Livermore				-4.14	32.4	28.5	32.0	27.4	27.5	10.2	23.1	38.5	40.71	38.2	39.9	39.67
	EB	Isabel	I-580 WB	*5.23	11:32	10:32	10:23	10:46	11:12	11:57	11:25	5:46	8:34	8:25	9:30	9:46
				-4.14	26.2	28.7	29.1	28.1	27	22.6	21.8	36.8	36.6	35.8	33.0	32.06
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
					19.0	19.7	22.7	18.0	17.9	17.4	18.8	18.5	14.45	16.5	18.6	16.24
	NB	35th St.	Carlson	5.46	16:56	15:32	18:12	17:42	26:00	18:36	22:39	19:56	22:53	23:36	17:59	20:53
					20.1	21.1	18.0	18.5	12.6	17.6	14.4	16.4	14.31	13.9	18.2	15.69
SR 185	SB	42nd ST	SR 92/238	10.46	42:55	28:47	n/a	30:31	29:12	32:11	30:56	33.25	34.23	34:22	34:41	36:00
					14.1	21.8	n/a	20.6	21.5	19.3	20.3	18.8	18.25	18.0	18.1	17.43
	NB	SR 92/238	42nd St	10.31	38:34	28:54	n/a	28:40	31:02	29:34	29:36	34:36	34:50	31:08	32:27	35:22
					18.6	21.7	n/a	21.8	20.2	21.3	21.2	17.9	17.76	20.0	19.1	17.49
SR 238 Mission	NB	I-680 NB	Jackson	12.39	24:05	n/a	27:30	27:10	27:04	26:37	30:05	30:30	27:55	27:55	27:45	31:32
					30.7	n/a	26.9	27.3	27.4	29.2	24.6	24.4	26.63	26.6	26.8	23.57
	SB	Jackson	I-680 NB	12.36	24:28	n/a	28:15	26:45	27:20	24:26	26:13	28:27	26:45	32:04	27:09	29:05
					30.3	n/a	26.2	27.7	27.1	31.0	28.2	26.1	27.73	23.1	27.3	24.86
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
					17.2	18.3	20.1	13.7	14.3	14.8	14.0	14.2	14.1	13.8	16.6	15.55

Appendix D-2: Comparison of p.m. Peak Period Travel-Time Data & Speed on Selected Arterial Routes (1991-2012)

CMP Route	Dir	From	To	Length (Miles)	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012
University Ave	SB	University	SR 24	2.76	10:07	9:12	9:59	10.26	10:45	12:01	12:45	10:50	9:55	11:11	9:53	10:53
					16.4	18	16.6	15.7	15.4	13.8	13	15.3	16.7	14.8	16.8	15.23
	EB	I-80 Off	Shattuck Pl	2.05	7:02	6:43	6:07	7:07	7.21	8:05	7:36	7:43	7:31	7:31	7:23	7:48
					17.5	18.3	20.1	17.2	16.7	15.2	16.2	15.9	16.4	16.4	16.7	15.76
	WB	Shattuck Pl	I-80 Off	2.05	6:38	6:30	7:07	7.27	9:51	7:45	7:01	8:23	7:24	7:00	7:08	8:39
					18.5	18.9	17.3	16.5	12.5	15.9	17.5	14.7	16.63	17.6	17.3	14.21
Decoto Rd/ Dumbarton Br	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
					45.7	42.3	38.6	32.6	38.5	37.3	30.9	33.2	33.9	35.1	37.3	36.54
	EB	County Line	Hwy 238	8.36	12:41	14:01	14:40	17:49	17:06	15:50	14:35	17:01	16:32	19:23	16:30	18.26
					42.3	28.3	36.6	30.0	31.4	34.9	36.8	29.5	30.3	25.9	30.4	27.19
SR 84 Niles Canyon	EB	SR 238	Isabel	*13.27	n/a	n/a	25.2	25:17	n/a	29:20	38:08	37:02	30:13	27:01	29:20	28:49
				-15.35	n/a	n/a	36.4	34.3	n/a	31.4	24.2	24.4	26.4	29.4	27.8	28.33
	WB	Isabel	SR 238	*12:93	n/a	n/a	20.37	25.58	n/a	19:56	22:41	24:42	21:55	16:28	17:49	17:28
				-15.01	n/a	n/a	42.7	41.4	n/a	45.9	39.7	40.8	35.4	40.9	44.67	45.58

APPENDIX E: Trend Analysis

Table E-1: Average Speeds on the CMP Network Observed During the LOS Monitoring Studies

Monitoring Year	Freeways (PM)	Arterials (PM)
	Speeds (mph)	
1991	50.7	26.1
1992	50.2	25.3
1993	49.1	24.2
1994	47.8	25.3
1996	48.4	25.5
1997	47.0	25.4
1998	47.7	25.3
2000	51.0	23.6
2002	51.2	23.3
2004	49.9	24.3
2006	48.4	24.6
2008	51.0	25.7
2010	51.8	26.1
2012	50.9	25.1

Table E-2: Average Annual Bay Area Unemployment Rate by Percentage of Population

Year	Unemployment Rate
1990	3.6
1991	5.1
1992	6.3
1993	6.4
1994	5.9
1995	5.4
1996	4.6
1997	3.9
1998	3.5
1999	2.9
2000	3.4
2001	4.4
2002	6.2
2003	6.4
2004	5.5
2005	4.8
2006	4.2
2007	4.4
2008	5.7
2009	9.6
2010	10.0
2011	9.4
2012	8.5

Table E-3: Average Daily VMT in Alameda County by Year

Year	Alameda County
1996	32,811,600
1997	34,104,800
1998	35,207,300
1999	36,774,300
2000	37,197,500
2001	35,113,900
2002	38,469,430
2003	38,501,270
2004	39,362,620
2005	39,232,580
2006	39,327,700
2007	38,391,920
2008	38,405,830
2009	37,692,690
2010	35,715,490
2011	36,531,750

Data Source: Caltrans California Public Road Data
http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php
Based on Highway Performance Monitoring System

APPENDIX F: Travel Routes for the Alameda County O-D Pairs—P.M. Peak Period

Appendix F-1: Travel Routes for the Alameda County O-D Pairs—p.m. Peak Period

#	Peak Period	Origin	Destination	Transit Route	Highway Travel
1	p.m.	**Hayward**	**Newark**	1996-2002: Walk to Hesperian, AC 97 to AC 29, at Union City BART Stn., to Newark/Lafayette, walk to door.	1996-2002: Walk to parking; Hesperian to Union City Blvd., to Newark Blvd., to Lafayette St.; park and walk to door.
		Kaiser Med. Ctr, 27400 Hesperian	1996-2002: Residence near Lafayette St at Newark Blvd.	2004-06: Walk to Hesperian, AC 97 to AC 232, at Union City BART Stn., to Cedar/Thornton, walk to door.	2004-2012: Walk to parking; Hesperian to Tennyson to I-880; exit Thornton to Ruschin; park and walk to door.
			2004-2012: Residence near Thornton Ave. and Ruschin Drive.	2008-2012: 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	
2	p.m.	**Emeryville**	**Berkeley**	1996-2006: Walk to 53rd and San Pablo, AC 72 or 73 to AC 43 at Solano Way, exit at Marin Circle, walk to door.	1996 – 2010: Walk to parking; 53rd St. to San Pablo Avenue, to Hopkins Street, to Marin Circle; park and walk to door. 2012: Unqualified data (for details, see Transit Route column)
		Chiron Office Bldg., 4560 Horton St., near 53rd & Hollis Sts.	Residence near Marin Circle at Los Angeles Ave.	2008: Walk to Shellmound St.and Ohlone Wy, AC 57 to AC 18 at 40th St/MacArthur BART to Sutter St./Hopkins St. walk to door.	
				2010: Walk to 53rd and San Pablo, AC 72 or 73 to AC H at Gilman St., exit at Marin Circle, walk to door. 2012: Unqualified data as data collection was conducted outside the hours specified for data collection, between 3 p.m. to 5 p.m. instead of 4:00 p.m. ot 6:00 p.m.	

Appendix F-1: Travel Routes for the Alameda County O-D Pairs—p.m. Peak Period

#	Peak Period	Origin	Destination	Transit Route	Highway Travel
3	p.m.	**Hayward**	**Livermore**	1996-2002: Walk to AC 92, to Hayward BART, BART to Dub/Pleas Station, Wheels 12 to Portola & N. Murietta, walk to Portola and North Livermore Ave; walk to door.	1996-2002: Walk to parking; Carlos Bee, to Mission Blvd, to "A"/Redwood, to I-580, to Portola exit, to N Livermore Ave.; park & walk to door.
		Cal State University at Carlos Bee Ave.	1996 – 2002: Residence near Portola and North Livermore Avenue.	2010: Unqualified route as transit travel was taken in a roundabout route and not using direct commuter route. 2004-2008, 2012: Walk to AC 92 (AC 60 in 2012), to Hayward BART, BART to Dub/Pleas Station, Wheels 12 or 12X (12X modified to 12 V in 2008) to N. Murietta and Portola (Del Norte in 2008 & 2012) ; walk to door.	2004-2012: Walk to parking; Carlos Bee, to Mission Blvd, to Grove Way, to I-580 EB, to Portola exit, to Hurton to Delaware Way; park and walk to door.
			2004-2008: Residence near Delaware Way and North Murrieta.		
4	p.m.	**Oakland**	**San Leandro**	1996 -2008: Walk to BART 12th St. Station; BART to San Leandro Station, to AC 84 to Farnsworth/Manor Blvd. walk to door.	1996- 2012: Walk to parking; local streets to I-880, to Marina Blvd, to Chapel Avenue; park and walk to door.
		Downtown Oakland 1333 Broadway building	Residence near Farnsworth St. and Chapel Ave.	2010-2012: Walk to BART 12th St. Station; BART to Bayfair BART Station, to AC 89 to Farnsworth/Manor Blvd. walk to door.	

Appendix F-1: Travel Routes for the Alameda County O-D Pairs—p.m. Peak Period

#	Peak Period	Origin	Destination	Transit Route	Highway Travel
5	p.m.	**Fremont**	**Pleasanton**	1996 – 2002: Walk to AC 22 to Fremont BART, BART to Dubl/Pleas Station, Wheels 10 to Greenwood Road and Valley Avenue, walk to door.	1996–2002: From parking to Fremont Blvd to Durham Road to I-680 to Sunol Blvd to Greenwood Rd.; park and walk to door.
		NUMMI Plant 45500 Fremont Blvd.	1996 – 2002: Residence near Valley Ave. and Greenwood Rd.	2004-2008: Walk to AC 212 or 218 to Fremont BART, BART to Dublin/Pleasanton Station, Wheels 7 or 8 to Valley Avenue, walk to door.	2004-2010: From parking to Fremont Blvd to Durham Road to I-680 to Bernal Ave. exit; to Valley Ave. to Hansen; park and walk to door.
			2004-2012: Residence near Hansen/Valley Ave.	2010: Walk to AC 212 or 218 to Fremont BART, BART to Dublin/Pleasanton Station, walk to, WHEELS 8B to Hansen and Valley. 2012: Unqualified data. Only two out of total four auto runs were conducted. Additionally, all available data were collected during the first hour of the two-hour peak period, so they are not representative.	2012: Unqualified data (for details, see Transit Route column)
6	a.m.	**Fremont**	**San Jose**	1998-2002: Walk to AC 27, transfer to SCVTA 140 at Fremont BART, walk to door.	1998-2012: From residential driveway to Thornton, to I-880, to SR 237, to Zanker; park and walk to door.
		Residence near Thorton Ave. at Fremont Blvd.	Fujitsu, 3801 Zanker Road at Tasman	2004-2006: Walk to AC 218; transfer to SCVTA 180 at Fremont BART; transfer to SCVTA 33; exit at Zanker; walk to door.	
				2008: Walk to ACE Fremont Station, ACE WB line #03 to Great America Station, walk to Tasman/Lickmill to VTA #330;exit at Zanker	
				2010- 2012: Walk to AC 216 (AC 251 in 2012) to Fremont BART station, VTA 140 to Tasman, walk to Zanker Road.	
7	a.m.	**Fremont**	**San Jose**		1998-2012: HOV: From residential driveway to Thornton, to I-880 HOV lanes, to SR 237, to Zanker; park and walk to door.
		Residence near Thorton Ave. at Fremont Blvd.	Fujitsu, 3801 Zanker Road at Tasman		

Appendix F-1: Travel Routes for the Alameda County O-D Pairs—p.m. Peak Period

#	Peak Period	Origin	Destination	Transit Route	Highway Travel
8	p.m.	**Oakland**	**Pleasanton**	1998-2002: Walk to BART 12th St., BART to Dublin/Pleasanton Station., Wheels 8, walk to door.	1998-2008: Walk to parking; local streets to I-880 to I-238 to I-580, to Hopyard to Valley; park and walk to door.
		Federal Building., Jefferson at 14th	1998-2002: Residence near Hopyard Rd. and Valley Ave.	2004-2006: Walk to BART 12th St., BART to Dublin/Pleasanton Station., Wheels 7 or 8 (in 2008 Wheels 8 or 54 to Fairgrounds ACE to Wheels 53) to Valley near Hansen, walk to door.	2010-2012: local streets to I-980 E to CA-24 exit I-580 E to Hayward, Hopyard exit right onto Hopyard, right onyto Valley Ave. right onto Hansen Drive.
			2004-06: Residence near Valley Ave. at Hansen Dr.	2010: Walk to BART 12th St., BART to Richmond/Fremont, transfer at Bayfair for BART to Dublin/Pleasanton Station., Wheels 8A or 54 to Valley near Hansen, walk to door. 2012: No new data has been collected.	2012: No new data has been collected.
9	P.M	**Fremont**	**Alameda**	1998 –2002: Walk to Fremont BART, BART to Coliseum, AC 49 to Alameda, walk to door.	1998-2002: Walk to parking; Mowry to I-880 to Hegenberger, to Doolittle, to Island; park and walk to door.
		Washington Hospital at Mowry Avenue.	Bay Farm Island, Residence near Searidge at Robert Davey.	2004-2008: Walk to Fremont BART; BART to Fruitvale; AC 50 to Alameda; exit at Robert Davey Jr. Dr.; walk to door.	2004-2012: Walk to parking; Mowry to I-880 to 98th Ave., to Doolittle, to Island Dr. and walk to door.
				2012: Walk to Fremont BART; BART to Fruitvale; AC 0 to Alameda take AC OX; exit at Robert Davey Jr. Dr.; walk to door.	

Appendix F-1: Travel Routes for the Alameda County O-D Pairs—p.m. Peak Period

#	Peak Period	Origin	Destination	Transit Route	Highway Travel
10	p.m.	**Alameda**	**Oakland**	1998-2002: AC 10 to BART 12th St., BART to Rockridge, walk to door.	1998-2008: Walk to parking; Atlantic to Webster, to I-880, to I-980, to SR 24, Claremont exit to Clifton, to Lawton, to College, park and walk to door.
		Naval Air Station, Atlantic at Main.	Business near College Ave. at Lawton.	2004-2008: AC 63 to BART 12th Street; BART to Rockridge; walk to door.	2010: Main St. to Appezzato Pkwy, onto CA-260 N/CA-61 N/Webster St, Posey Tube, onto Broadway to Telegraph, left onto College Ave.
				2010: AC 31 to Atlantic to AC 51 College Ave. walk to door. 2012: Unqualified data as data collected were not representative since all of the data were collected within the first hour of the two-hour peak period.	2012: Unqualified data (for details, see Transit Route column).

APPENDIX G: 2012 LOS Monitoring Study Results—Detailed Data by Data Collection Period

Appendix G-1

Appendix G-1: 2012 LOS Monitoring Study Results for Freeways—p.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	(Years)	Speed	LOS	Speed	LOS
1	I-80 - EB	SF County Line	Toll Plaza	Oak	1	2.06	10	06	53.4	C	49.9	C
2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1	1.15	10	93-02,06, 08	54.2	C	25.4	**(F30)**
3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery - Berk	1	0.79	10	91-95, 97-08, 10	16.58	**(F20)**	13.05	**(F20)**
4	I-80 - EB	Powell	Ashby	Emery - Berk	1	0.67	10	91-95, 97-08,10	11.68	**(F20)**	12.29	**(F20)**
5	I-80 - EB	Ashby	University	Emery - Berk	1	1.34	10	91-95, 97-08	31.74	E	25.72	**(F30)**
6	I-80 - EB	University	Jct I-580 (off)	Berk - Alb	1	1.51	10	91-92, 96-97,02,06	44.8	D	33.5	E
7	I-80 - EB	Jct I-580 (off)	Central (on)	Berk - Alb	1	1.12	10	91-92, 96-97,02,06-08	39.1	E	27.7	**(F30)**
8	I-80 - WB	Central	Jct I-580	Berk - Alb	1	0.70	10		46.7	D	52.0	C
9	I-80 - WB	Jct I-580	University	Berk - Alb	1	1.49	10	10	23.7	**(F30)**	28.7	**(F30)**
10	I-80 - WB	University	Ashby	Emery - Berk	1	1.36	10	91-92, 94-'06'10	24.7	**(F30)**	23.3	**(F30)**
11	I-80 - WB	Ashby	Powell	Emery - Berk	1	0.64	10	91-92, 94-08,10	16.6	**(F20)**	15.5	**(F20)**
12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery - Berk	1	0.42	10	91-92, 94-'06	31.7	E	28.0	**(F30)**
13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1	1.20	10	91-'93. '97-'00,04,06	41.7	D	39.4	E
14	I-80 - WB	Toll Plaza	SF County	Oak	1	2.00	10		41.5	D	40.9	E
15	I-238 - EB	I-880	I-580	Uninc-San L	2	2.28	6	91-92,94,96-97,02,06	62.3	A	38.7	E
16	I-238 - WB	I-580	I-880	Uninc-San L	2	1.60	6	97-'08	61.8	A	52.1	C
17	I-580 - EB	I-238/ Fthl Off	Grove	Unincorp	2	2.88	8		56.4	B	51.1	C
18	I-580 EB	Grove	Eden Canyon	Uninc - Pleas	4	2.17	8		72.9	A	54.3	C
19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc - Pleas	4	4.80	8		38.3	E	48.0	D
20	I-580 EB	San Ramon/Foothill	I-680	Uninc - Pleas	4	0.77	8	08,10	13.6	**(F20)**	33.2	E
21	I-580 EB	I-680	Hopyard	Plea	4	0.76	8	98-'02,06-08,10	8.7	**(F10)**	24.6	**(F30)**
22	I-580 EB	Hopyard	Santa Rita	Plea	4	1.96	8	98-'02,06-08,10	10.8	**(F20)**	26.2	**(F30)**
23	I-580 EB	Santa Rita	El Charro	Uninc-Pleas	4	1.24	8	02, 08,10	22.3	**(F30)**	34.1	E
24	I-580 EB	El Charro	SR 84/Airway Blvd.	Liv	4	1.52	8	02	41.1	D	56.1	B
25	I-580 EB	SR 84/Airway Blvd.	Portola	Liv	4	1.71	8	02	53.5	C	61.0	A
26	I-580 - EB	Portola	1st St	Liv	4	2.70	8	02	66.3	A	65.0	A
27	I-580 - EB	1st St	Greenville	Liv-Uninc	4	1.98	8		56.0	B	29.3	**(F30)**
28	I-580 - EB	Greenville	N.Flynn	Uninc	4	1.50	8		35.4	E	25.4	**(F30)**
29	I-580 - EB	N.Flynn	Grant Line	Uninc	4	3.19	8		47.2	D	39.6	E
30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	4	1.11	8		45.6	D	37.8	E
31	I-580 - WB	I-205 (SJ Co)	Grant Line	Liv - Uninc	4	0.89	8		38.0	E	37.1	E
32	I-580 - WB	Grant Line	N Flynn	Liv - Uninc	4	4.56	8		68.3	A	69.0	A
33	I-580 - WB	N Flynn	Greenville Rd	Liv - Uninc	4	2.34	8		66.8	A	68.0	A
34	I-580 - WB	Greenville Rd	1st St	Liv - Uninc	4	2.30	8		66.6	A	66.2	A
35	I-580 - WB	1st St	Portola Ave	Liv	4	2.52	8		63.7	A	63.4	A
36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv	4	1.76	8		70.1	A	69.6	A
37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Liv	4	1.78	8		72.1	A	68.4	A
38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	4	1.16	8		64.8	A	61.3	A

Appendix G-1: 2012 LOS Monitoring Study Results for Freeways—p.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	(Years)	Speed	LOS	Speed	LOS
39	I-580 - WB	Tassajara Rd	I-680	Plea	4	2.87	8		67.2	A	62.1	A
40	I-580 - WB	I-680	San Ramon Rd	Plea - Uninc	4	0.69	8		62.7	A	62.9	A
41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea - Uninc	4	4.75	8		67.2	A	62.4	A
42	I-580 - WB	Eden Canyon	Center St	Plea - Uninc	4	2.28	8		70.5	A	67.8	A
43	I-580 - WB	Center	I-580/238	Unincorp	2	1.94	8	'00	60.3	A	57.4	B
44	I-580 - EB	I-80	I-980	Oak	1	1.24	8	91-'92, 08-10	25.7	**(F30)**	18.6	**(F20)**
45	I-580 - EB	I-980	Harrison	Oak	1	0.95	8	91-'92	41.1	D	30.1	E
46	I-580 - EB	Harrison	Lakeshore	Oak	1	0.69	8	08-10	27.0	**(F30)**	31.2	E
47	I-580 - EB	Lakeshore	Coolidge	Oak	1	2.25	8		36.6	E	43.7	D
48	I-580 - EB	Coolidge	SH 13 Off	Oak	1	2.15	8	10	31.4	**(F30)**	52.1	C
49	I-580 - EB	SH 13 Off	MacArthur	Foothill	1	4.09	8		50.8	C	42.4	D
50	I-580 - EB	MacArthur	I-580/238	SL - Hay	2	4.33	8		67.4	A	66.6	A
51	I-580 - WB	I-238	Foothill/MacArthur	Oak -SL	2	4.42	8		70.9	A	71.0	A
52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak -SL	1	3.89	8		61.9	A	64.0	A
53	I-580 - WB	SH 13 Off	Fruitvale	Oak	1	2.36	8		61.4	A	60.8	A
54	I-580 - WB	Fruitvale	Harrison	Oak	1	2.21	8		56.0	B	55.0	C
55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1	1.16	8		52.6	C	53.0	C
56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1	0.69	8	06	56.7	B	14.2	**(F20)**
57	I-580 - EB	Central	I-80 Jct	Alb	1	0.77	4		45.9	D	46.3	D
58	I-580 - WB	I-80 Jct	Central	Alb	1	1.07	4		64.8	A	66.6	A
59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	3	2.20	6		58.0	B	51.4	C
60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	3	1.34	6	08-10	16.5	**(F20)**	20.1	**(F30)**
61	I-680 - NB	Durham Rd	Washington Blvd	Fre	3	1.54	6	08-10	20.4	**(F30)**	23.4	**(F30)**
62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	3	0.89	6		36.9	E	38.7	E
63	I-680 NB	SR 238/Mission	Vargas Rd	Unincorp	3	0.82	6	10	44.0	D	53.7	C
64	I-680 NB	Vargas Rd	Andrade Rd	Unincorp	3	2.64	6		28.1	**(F30)**	28.9	**(F30)**
65	I-680 NB	Andrade Rd	Calaveras	Unincorp	3	1.13	6		33.3	E	39.3	E
66	I-680 NB	Calaveras	Rt.84/Vallecitos	Unincorp	3	0.30	6		59.2	B	63.7	A
67	I-680 NB	SR 84	Sunol Blvd	Plea - Uninc	4	3.45	6		67.0	A	64.7	A
68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea - Uninc	4	1.52	6		64.3	A	62.5	A
69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	4	2.39	6		65.7	A	60.8	A
70	I-680 NB	Stoneridge Dr	I-580	Plea	4	0.84	6		70.1	A	63.4	A
71	I-680 - NB	I-580	Alcosta	Dub	4	1.83	6		62.4	A	55.8	B
72	I-680 - SB	Alcosta	I-580	Dub	4	1.84	6		69.0	A	68.8	A
73	I-680 SB	I-580	Stoneridge Dr	Plea	4	0.76	6		62.9	A	62.2	A
74	I-680 SB	Stoneridge Dr	Bernal	Plea	4	2.55	6		66.6	A	65.4	A
75	I-680 SB	Bernal Ave.	Sunol Blvd	Unincorp	4	1.31	6		61.1	A	59.7	B
76	I-680 SB	Sunol Blvd.	SR 84	Unincorp	4	3.82	6		68.6	A	67.8	A
77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Unincorp	3	1.32	6		64.7	A	65.4	A
78	I-680 SB	Andrade Rd	Sheridon Rd	Unincorp	3	1.39	6		61.5	A	61.9	A
79	I-680 SB	Sheridon Rd	Vargas Rd	Unincorp	3	0.81	6		66.5	A	63.9	A
80	I-680 SB	Vargas Rd	SR 238/Mission	Unincorp	3	1.08	6		63.2	A	63.7	A

Appendix G-1: 2012 LOS Monitoring Study Results for Freeways—p.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	(Years)	Speed	LOS	Speed	LOS
81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	3	1.04	6		65.9	A	64.0	A
82	I-680 - SB	Washington Blvd	Durham Rd	Fre	3	1.52	6		67.8	A	67.6	A
83	I-680 - SB	Durham Rd	Rt 2262/Mission	Fre	3	1.67	6		70.7	A	70.6	A
84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	3	2.19	6		62.3	A	64.4	A
85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	3	2.08	8	91-'92	52.1	C	32.9	E
86	I-880 - NB	SR 262/Mission	AutoMall Pkwy	Fre	3	2.44	8	96	42.0	D	46.8	D
87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	3	1.54	8	96	49.6	C	50.2	C
88	I-880 - NB	Stevenson	Decoto	Fre	3	4.04	8	96-'98	49.7	C	56.3	B
89	I-880 - NB	Decota	Alvarado Blvd	Fre - Un Cty	3	1.17	8	02,10	28.6	**(F30)**	42.8	D
90	I-880 - NB	Alcarado Blvd	Alvarado-Niles Blvd	Fre- Uni Cty	3	1.17	8	02,10	26.8	**(F30)**	39.2	E
91	I-880 - NB	Alv-Niles	Tennyson	Un Cty - Hay	3	2.65	8	00-02,06-08,10	17.7	**(F20)**	24.7	**(F30)**
92	I-880 - NB	Tennyson	SR 92	Hay	2	1.14	8	91-'92	37.7	E	19.2	**(F20)**
93	I-880 - NB	SR 92	A St	Hay	2	1.52	8	91-'92	38.4	E	25.5	**(F30)**
94	I-880 - NB	A St	I-238	Unincorp	2	1.82	8	94-'95	62.7	A	45.1	D
95	I-880 - NB	I-880/I238 (split)	Marina Blvd	Oak -SL	2	2.66	8		66.8	A	65.8	A
96	I-880 - NB	Marina Blvd	SR 112/Davis	Oak - SL	2	0.79	8		62.1	A	60.9	A
97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - SL	2	1.88	8		56.5	B	60.5	A
98	I-880 - NB	Hegenberger	High/42nd	Oak	1	2.47	8		52.7	C	48.5	D
99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1	1.06	8		64.5	A	58.0	B
100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	1	2.64	8		57.7	B	61.8	A
101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	1	2.38	8		60.8	A	63.6	A
102	I-880 - NB	I-880/I 80 (split)	I-880/I-80 (merge)	Oak	1	1.40	8		31.5	E	15.2	**(F20)**
				Oak	1	3.17	6					
103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1	1.63	8		65.3	A	65.0	A
104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	1	2.65	8		64.0	A	72.3	A
105	I-880 - SB	I-980	23rd	Oak	1	2.79	8	06	30.2	E	39.5	E
106	I-880 - SB	23rd St	High/42nd	Oak	1	1.35	8		67.9	A	37.3	E
107	I-880 - SB	High/42nd	Hegenberger	Oak	1	2.27	8	06	36.8	E	35.1	E
108	I-880 - SB	Hegenberger	SR 112/Davis	Oak - SL	1	1.69	8	91-'92,08	37.6	E	51.7	C
109	I-880 - SB	SR 112/Davis	Marina Blvd	Oak - SL	1	0.87	8	91-'92	57.1	B	56.4	B
110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak - SL	1	2.41	8	91-'92	59.5	B	63.7	A
111	I-880 - SB	I-238	A St	SL-Uninc	2	2.03	8	91-'92, '00-02	32.3	E	53.9	C
112	I-880 - SB	A St	Rt 92	Hay	2	1.81	8		37.2	E	39.9	E
113	I-880 - SB	Rt 92	Tennyson	Hay	2	0.96	8	00	35.0	E	33.6	E
114	I-880 - SB	Tennyson	Alv-Niles	Hay - UC	2	2.49	8		45.9	D	41.9	D
115	I-880 - SB	Alv-Niles	Alvarado	UC - Fre	3		8		57.9	B	54.0	C
116	I-880 - SB	Alvarado	Decoto	UC - Fre	3		8		58.9	B	42.2	D
117	I-880 - SB	Decoto	Stevenson	Fre	3	4.07	8		58.9	B	54.4	C
118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	2	1.26	8		64.8	A	64.5	A
119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2	3.04	8		62.4	A	62.5	A
121	I-980 - WB	SR 24 @ 580	I-880	Oak	1	2.27	8		64.8	A	65.2	A
122	I-980 - EB	I-880	SR 24 @ 580	Oak	1	2.32	8	'91	29.7	**(F30)**	39.4	E

Appendix G-1: 2012 LOS Monitoring Study Results for Freeways—p.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	(Years)	Speed	LOS	Speed	LOS
123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1	1.20	4		88.8	A	83.1	A
124	SR 13 - NB	Carson/Redwood (1)	Joaquin Miller	Oak	1	1.09	4		44.4	D	43.3	D
125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1	1.77	4		61.4	A	56.0	B
126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1	1.57	4	06,10	24.2	**(F30)**	18.9	**(F20)**
127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1	1.66	4		57.2	B	54.1	C
128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1	2.04	4		71.2	A	69.6	A
129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1	1.34	4		61.4	A	61.1	A
130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1	0.89	4	08,10	12.5	**(F20)**	15.6	**(F20)**
131	SR 24 - EB	I-580 (on ramp)	Broadway/SR 13	Oak	1	2.08	8	91-'97, '02, 06, 08,10	15.8	**(F20)**	16.0	**(F20)**
132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1	1.41	8	91-'97,'02,06-08,10	14.5	**(F20)**	14.1	**(F20)**
133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1	1.03	8	91-'97,'02,06	34.6	E	35.9	E
134	SR 24 - WB	Fish Ranch Road	Caldecott (exit)	Oak	1	0.99	8		50.9	C	51	C
135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1	1.77	8		69.4	A	68.8	A
136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1	2.19	8		59.3	B	57.8	B
137	SR 84 - EB	San M CL	Toll Plaza	Fremont	3	2.97	6		56.2	B	51.9	C
138	SR 84 - EB	Toll Plaza	Thornton	Fremont	3	0.27	6	06	58.9	B	57.2	B
139	SR 84 - EB	Thornton	Newark Blvd/Ardenwood	Newark	3	1.23	6	08	65.8	A	45.9	D
140	SR 84 - EB	Newark	I-880 NB (off)	Newark	3	0.97	6	08-10	26.9	**(F30)**	16.4	**(F20)**
141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark	Newark	3	0.99	6		45.9	D	47.2	D
142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy		3	1.15	6		60.2	A	63.4	A
143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate		3	0.75	6		51.4	C	44.0	D
144	SR 84 - WB	Toll Plaza	San M CL	Fremont	2	3.17	6		64.8	A	64.1	A
145	SR 92 - EB	San M CL	Toll Plaza	Uninc - Hay	2	2.61	6	97-'02	65.9	A	47.4	D
146	SR 92 - EB	Toll Plaza	Clawiter	Uninc - Hay	2	1.76	6	91-'94, '96-'02	37.6	E	49.7	C
147	SR 92 - EB	Clawiter	I-880	Hay	2	2.10	6	91-92,94-'95,97-'02,06-1	10.0	**(F20)**	54.4	C
148	SR 92 - WB	I-880	Clawiter	Hay	2	2.01	6		52.4	C	59.7	B
149	SR 92 - WB	Clawiter	Toll Plaza	Uninc - Hay	2	1.87	6	91-'92	45.6	D	42.2	D
150	SR 92 - WB	Toll Plaza	San M CL	Uninc - Hay	2	2.61	6		61.7	A	61.7	A

Appendix G-2

Appendix G-2: 2012 LOS Monitoring Study Results for Arterials—p.m. Peak Period

		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Juris	(miles)	Class[1]	Area	Lanes	(Years)	Speed	LOS	Speed	LOS
1	150th St - EB	Hesperian	I-580	SL	0.51	II	2	2		17.0	D	13.6	E
2	150th St - WB	I-580	Hesperian	SL	0.51	II	2	2		16.5	D	18.2	C
3	A Street - EB	I-880	Western	Hay	1.08	II	2	2		23.3	C	18.8	C
4	A Street - EB	Western	SR 238	Hay	0.53	III	2	2		7.6	E	5.2	**(F)**
5	A Street - WB	SR 238	Western	Hay	0.53	III	2	2		13.5	C	10.3	D
6	A Street - WB	Western	I-880	Hay	1.08	II	2	2		21.8	C	17.7	D
7	Atlantic - EB	Main	Webster	Ala	0.80	II	1	2		20.7	C	19.5	C
8	Atlantic - WB	Webster	Main	Ala	0.80	II	1	2		23.7	C	20.7	C
9	Hegenberger - EB	SR 61	Edgewater	Oak	0.76	I	**1**			17.5	D	15.9	E
10	Hegenberger - EB	Edgewater	Baldwin	Oak	0.73	I	1	3		27.8	C	20.0	D
11	Hegenberger - EB	Baldwin	E 14th	Oak	1.03	I	1	3		25.1	C	25.5	C
12	Hegenberger - WB	E 14th	Baldwin	Oak	1.03	I	1	3		35.9	A	30.0	B
13	Hegenberger - WB	Baldwin	Edgewater	Oak	0.73	I	1	3		25.3	C	18.1	D
14	Hegenberger - WB	Edgewater	SR 61	Oak	0.76	I	**1**			20.0	D	19.5	D
15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	0.47	I	2	3	06-08	15.0	E	14.9	E
16	Hesperian - NB	SH 92	La Playa	Hay	0.79	II	2	3	92	19.2	C	18.3	C
17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	0.44	II	2	3	92,08-10	5.6	**(F)**	11.6	E
18	Hesperian - NB	W.Winton Ave	A St	Hay	0.96	II	2	3	92	18.1	C	13.9	E
19	Hesperian - NB	A St	Hacienda	Unin	0.65	II	2	2		19.5	C	16.8	D
20	Hesperian - NB	Hacienda	Grant	Unin	0.65	II	2	2		29.4	B	16.6	D
21	Hesperian - NB	Grant	Llewelling	Unin	0.28	II	2	2	00,04,06-10	8.1	**(F)**	6.9	**(F)**
22	Hesperian - NB	Llewelling	Springlake	Unin	0.40	II	2	2		23.3	C	18.2	C
23	Hesperian - NB	Springlake	Fairmont	SL	0.66	II	2	2		14.8	D	13.5	E
24	Hesperian - NB	Fairmont	14th	SL	0.32	II	2	2		13.7	E	15.0	D
25	Hesperian - SB	14th	Fairmont	SL	0.31	II	2	2	'91, '95, '97,08	12.4	E	17.5	D
26	Hesperian - SB	Fairmont	Springlake	SL	0.65	II	2	2	'91 - '92	18.8	C	17.5	D
27	Hesperian - SB	Springlake	Llewelling	Unin	0.40	II	2	2	'00, 10	8.1	**(F)**	7.9	**(F)**
28	Hesperian - SB	Llewelling	Grant	Unin	0.28	II	2	2		13.8	E	13.5	E
29	Hesperian - SB	Grant	Hacienda	Unin	0.65	II	2	2		21.8	C	26.8	B
30	Hesperian - SB	Hacienda	A St	Unin	0.65	II	2	2		19.6	C	19.6	C
31	Hesperian - SB	A St	W.Winton Ave.	Hay	0.96	II	2			18.6	C	22.3	C
32	Hesperian - SB	W.Winton Ave	La Playa	Hay	0.44	II	2			24.8	B	18.4	C
33	Hesperian - SB	La Playa	SH 92	Hay	0.79	II	2			17.2	D	18.6	C
34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	0.47	I	2	3	08-10	11.0	**(F)**	11.7	**(F)**
35	Mowry - EB	I-880	Farwell	Fre	0.34	II	3	2	'91 - '92	14.1	D	17.0	D
36	Mowry - EB	Farwell	SH 84	Fre	2.63	II	3	2		25.1	B	25.9	B
37	Mowry - WB	SH 84	Farwell	Fre	2.63	II	3	2		22.6	C	22.7	C
38	Mowry - WB	Farwell	I-880	Fre	0.34	II	3	2		20.9	C	23.9	C
39	Park/23rd - EB	Encinal	Santa Clara	Ala	0.23	III	1	2		21.3	B	11.2	D
40	Park/23rd - EB	Santa Clara	Kennedy	Ala	0.66	III	1	2		13.2	C	13.1	C
41	Park/23rd - EB	Kennedy	E 11th	Ala - Oak	0.45	II	1	2		13.9	E	19.8	C
42	Park/23rd - WB	E 11th	Kennedy	Ala - Oak	0.45	II	1	2		24.1	B	29.8	B

Appendix G-2: 2012 LOS Monitoring Study Results for Arterials—p.m. Peak Period

		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Juris	(miles)	Class[1]	Area	Lanes	(Years)	Speed	LOS	Speed	LOS
43	Park/23rd - WB	Kennedy	Santa Clara	Ala	0.66	III	1	2		12.9	D	12.8	D
44	Park/23rd - WB	Santa Clara	Encinal	Ala	0.23	III	1	2		12.8	D	9.7	D
45	MLK Jr Way -NB	SH 24	Adeline	Oak	0.90	II	1	2		18.1	C	17.4	D
46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	0.30	II	1	2	04	18.8	C	15.2	D
47	Adeline - NB	MLK Jr - North	Shattuck/Adeline	Berk	0.63	II	1	2		15.5	D	15.3	D
48	Shattuck NB	Shattuck/Adeline	Dwight	Berk	0.32	II	1	2		17.2	D	15.7	D
49	Shattuck NB	Dwight	University	Berk	0.63	III	1	2		14.9	C	13.8	C
50	Shattuck SB	University	Dwight	Berk	0.63	III	1	2		13.5	C	12.8	D
51	Shattuck SB	Dwight	Shattuck/Adeline	Berk	0.32	II	1	2		22.5	C	26.3	B
52	Adeline - SB	Shattuck/Adeline	MLK Jr - North	Berk	0.63	II	1	2		13.1	E	13.0	E
53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	0.30	II	1	2	'95, '00	20.0	C	21.5	C
54	MLK Jr Way -SB	Adeline	SH 24	Oak	0.88	II	1	2		21.7	C	15.3	D
55	Tennyson - EB	Hesperian	I-880	Hay	0.88	I	2	2	06	22.0	C	20.1	D
56	Tennyson - EB	I-880 NB	Rt 238	Hay	1.55	II	2	2		19.9	C	19.2	C
57	Tennyson - WB	Rt 238	I-880	Hay	1.63	II	2	2		19.2	C	20.1	C
58	Tennyson - WB	I-880	Hesperian	Hay	0.85	I	2	2		21.6	D	20.5	D
59	University - EB	I-80 SB	6th	Berk	0.40	II	1	2		26.7	B	16.9	D
60	University - EB	6th	San Pablo	Berk	0.31	II	1	2		19.0	C	15.3	D
61	University - EB	San Pablo	Sacramento	Berk	0.56	II	1	2		11.5	E	18.4	C
62	University - EB	Sacramento	ML King	Berk	0.48	II	1	2		18.9	C	16.6	D
63	University - EB	ML King	Shattuck Pl	Berk	0.30	III	1	2		17.0	C	11.2	D
64	University - WB	Shattuck Pl	ML King	Berk	0.30	III	1	2		13.7	C	11.0	D
65	University - WB	ML King	Sacramento	Berk	0.48	II	1	2		19.2	C	24.8	B
66	University - WB	Sacramento	San Pablo	Berk	0.56	II	1	2		12.6	E	9.9	**(F)**
67	University - WB	San Pablo	6th	Berk	0.31	II	1	2	'98	17.9	D	10.2	E
68	University - WB	6th	I-80 SB	Berk	0.40	II	1	2		38.9	A	37.8	A
69	SR 13 Ashby - WB	Hiller	Domingo	Oak - Berk	0.79	II	1	2		25.6	B	21.3	C
70	SR 13 Ashby - WB	Domingo	College	Berk	0.50	III	1	1		18.0	C	16.0	C
71	SR 13 Ashby - WB	College	Telegraph	Berk	0.38	III	1	1		11.0	D	10.2	D
72	SR 13 Ashby - WB	Telegraph	Shattuck	Berk	0.38	III	1	1	'91 - '92	12.5	D	14.8	C
73	SR 13 Ashby - WB	Shattuck	ML King	Berk	0.24	III	1	1	'91 - '92	9.2	D	7.8	E
74	SR 13 Ashby - WB	ML King	San Pablo	Berk	0.87	III	1	1		13.8	C	11.8	D
75	SR 13 Ashby - WB	San Pablo	I-80 Ramps	Berk	0.64	II	1	2		22.0	C	18.2	C
76	SR 13 Ashby - EB	I-80	San Pablo	Berk	0.61	II	1	2		19.8	C	13.9	E
77	SR 13 Ashby - EB	San Pablo	ML King	Berk	0.87	III	1	1		17.9	C	19.5	B
78	SR 13 Ashby - EB	ML King	Shattuck	Berk	0.24	III	1	1		8.6	E	7.2	E
79	SR 13 Ashby - EB	Shattuck	Telegraph	Berk	0.38	III	1	1		13.4	C	15.8	C
80	SR 13 Ashby - EB	Telegraph	College	Berk	0.38	III	1	1		7.3	E	12.9	D
81	SR 13 Ashby - EB	College	Domingo	Berk	0.50	III	1	1	91,00,04,10	6.5	**(F)**	7.7	E
82	SR 13 Ashby - EB	Domingo	Hiller	Berk - Oak	0.79	II	1	2		24.0	C	25.4	B
83	SR 61 - SB	Atlantic	Cent/Webster	Ala	0.55	III	1	2		11.5	D	12.7	D
84	SR 61 - SB	Cent/Webster	Sher/Encino	Ala	0.73	II	1	2		23.1	C	18.9	C
85	SR 61 - SB	Sher/Encino	Park	Ala	1.22	II	1	1		19.2	C	18.7	C
86	SR 61 - SB	Park	High/Otis	Ala	1.06	II	1	1		20.2	C	21.4	C
87	SR 61 (Doolittle) - SB*	High	Island Dr	Ala	0.41	II	1	2		17.8	D	20.7	C

Appendix G-2: 2012 LOS Monitoring Study Results for Arterials—p.m. Peak Period

		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Juris	(miles)	Class[1]	Area	Lanes	(Years)	Speed	LOS	Speed	LOS
88	SR 61 (Doolittle) - SB*	Island Dr	Harbor Bay Pkwy	Ala	0.50	I	1	2		31.9	B	29.0	B
89	SR 61 - SB	Harbor Bay	Airport Dr	Oak	2.15	I	1	1		33.0	B	31.1	B
90	SR 61 (Doolittle) - SB	Airport	Davis	Oak - SL	0.95	I	1	2		39.5	A	30.0	B
91	SR 61 (Doolittle) - NB	Davis	Airport	SL - Oak	0.95	I	2	2		33.1	B	30.0	B
92	SR 61 - NB	Airport Dr	Harbor Bay	Ala	2.15	I	1	1		36.2	A	36.4	A
93	SR 61 (Doolittle)-NB*	Harbor Bay	Island Dr	Ala	0.50	I	1	2		27.5	B	32.8	A
94	SR 61 (Doolittle)-NB*	Island Dr	High/Otis	Ala	0.41	II	1	2		18.6	C	16.6	D
95	SR 61 - NB	High/Otis	Park	Ala	1.06	II	1	1		25.5	B	22.8	C
96	SR 61 - NB	Park/Encinal	Sher/Cent	Ala	1.22	II	1	1		18.0	C	17.7	D
97	SR 61 - NB	Sher/Cent	Web/Cent	Ala	0.73	II	1	2		21.0	C	21.5	C
98	SR 61 - NB	Cent/Web	Atlantic	Ala	0.55	III	1	2		16.3	C	15.0	C
99	SR 77 (42nd) - EB	I-880 NB	E 14th	Oak	0.32	I	1	2		27.7	C	No data collected due to construction	
100	SR 77 (42nd) - WB	E 14 th	I-880 NB	Oak	0.30	I	1	2		33.4	B		
101	Decoto - WB	SH 238/Mission	Union Square	UC	0.85	II	3	2		19.7	C	17.4	D
102	Decoto - WB	Union Square	Alv-Niles Rd	UC	0.25	II	3	2	91-94,96,98, '00-04,06	14.6	D	13.7	E
103	Decoto - WB	Alv-Niles Rd	Fremont CL	UC	0.66	II	3	2		27.7	B	29.0	B
104	Decoto - WB	Fremont CL	I-880 NB (off)	Fre	1.15	II	3	2		22.0	C	23.0	C
105	Decoto - EB	I-880 NB (off)	Union City CL	Fre	1.15	II	3	2		19.2	C	16.4	D
106	Decoto - EB	Union City CL	Alv-Niles Rd	UC	0.66	II	3	2		13.6	E	17.9	D
107	Decoto - EB	Alv-Niles Rd	Union Square	UC	0.25	II	3	2		18.7	C	19.1	C
108	Decoto - EB	Union Square	SH 238/Mission	UC	0.85	II	3	2		20.7	C	21.5	C
109	SR 84/Mowry (Fre)-WB	SH 238	Peralta	Fre	0.78	I	3			31.9	B	35.3	A
110	SR 84/Peralta (Fre)-WB	Mowry	Fremont	Fre	1.66	I	3			24.8	C	27.9	C
111	SR 84/Fremont(Fre)-WB	Peralta	Thornton	Fre	0.33	II	3		91-92, 94, 02	10.3	E	10.5	E
112	SR 84/Thornton(Fre)-WB	Fremont	I-880 SB	Fre	1.29	II	3			24.7	B	26.5	B
113	SR 84/Thornton (Fre)-EB	I-880 SB	Fremont	Fre	1.29	II	3	4		20.8	C	24.9	B
114	SR 84/Fremont (Fre)-EB	Thornton	Peralta	Fre	0.32	II	3	4		10.2	E	10.5	E
115	SR 84/Peralta (Fre) - EB	Fremont	Mowry	Fre	1.64	I	3	2		25.2	C	24.6	C
116	SR 84/Mowry (Fre) - EB	Peralta	SH 238	Fre	0.87	I	3	4(2)	'00	18.8	D	17.4	D
117	1st Street - SB	I-580 Off	N Mines	Liv	0.61	I	4			21.6	D	21.0	D
118	1st Street - SB	N Mines	Inman	Liv	1.05	I	4			31.4	B	31.8	B
119	1st Street - NB	Inman	N Mines	Liv	1.05	I	4			28.7	B	30.8	B
120	1st Street - NB	N Mines	I-580 Off	Liv	0.61	I	4			31.2	B	27.4	C
121	SR 84 - EB	SR 238/Mission	Union City Limit	Fre	1.59	Rural (41.9)	3	2		38.4	A	35.8	B
122	SR 84 - EB	Union City Limit	Palamoras	Fre	0.94	Rural (44.5)	3	2		42.1	A	41.9	A
123	SR 84 - EB	Palamoras	Niles Cnyn Quarry	Fre	2.16	Rural (43.8)	3	2		42.5	A	43.8	A
124	SR 84 - EB	Niles Cnyn Quarry	Sunol Rd	Fre	1.75	Rural (46.7)	3	2		45.5	A	47.7	A
125	SR 84 - EB	Sunol Rd	Plea-Sunol Rd	Fre	0.53	Rural (27.6)	3	2	10	4.7	**(F)**	4.8	**(F)**
126	SR 84 - EB	Ple-Sunol Rd	SR 84 (Off)/I-680	Unin	0.77	Rural (42.9)	4	2	02-04,06	44.0	A	41.0	A
127	SR 84 - EB	SR 84 (Off)/I-680	Vallecitos Ln	Unin	1.07	Rural (50.8)	4	2	02-04,06,10	11.7	**(F)**	13.6	**(F)**
128	SR 84 - EB	Vallecitos Ln	Vallecitos Nuc.Cntr	Unin	1.14	Rural (57.5)	4	2	02-04,06	31.6	E	29.1	E
129	SR 84 - EB	Vallecitos Nuc Center Ent.	Culvert (Lat/Long: 37.613854,-121.817224)	Unin	1.65	Rural (58.3)	4	2		44.5	C	43.4	C

Appendix G-2: 2012 LOS Monitoring Study Results for Arterials—p.m. Peak Period

		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Juris	(miles)	Class[1]	Area	Lanes	(Years)	Speed	LOS	Speed	LOS
130	SR 84 - EB	Culvert (Lat/Long: 37.613854,-121.817224)	Ruby Hill /Kaithoff	Unin	1.62	Rural (59.2)	4	2		59.1	A	56.4	A
131	SR 84 - EB	Ruby Hill./Kaithoff	Isabel/Vallecitos	Unin	0.38	I	4	2		29.4	A	29.8	A
132	SR 84 (Liv) - NB	Isabel/Vallecitos	Vineyard	Liv	1.12	I	4	2		37.0	A	35.2	A
133	SR 84 (Liv) - NB	Vineyard	Concannon	Liv	0.60	I	4	2		34.7	B	40.0	A
134	SR 84 (Liv) - NB	Concannon	Stanley	Liv	1.07	I	4	2		36.7	A	37.2	A
135	SR 84 (Liv) - NB	Stanley	W. Jack London Blvd.	Liv	0.88	I	4	2		38.3	A	31.5	B
136	SR 84 (Liv) - NB	W. Jack London Blvd.	Airway/Kitty Hawk	Liv	0.49	I	4	2		26.6	C	22.0	D
137	SR 84 (Liv) - NB	Airway/Kitty	I-580 (Off)	Liv	1.06	I	4	2		26.2	C	28.6	B
138	SR 84 (Liv) - SB	I-580 (On)	Airway/Kitty Hawk	Liv	1.06	I	4	2		28.8	B	33.5	B
139	SR 84 (Liv) - SB	Airway/Kitty	W. Jack London Blvd.	Liv	0.49	I	4	2		37.2	A	39.6	A
140	SR 84 (Liv) - SB	W. Jack London Blvd.	Stanley	Liv	0.90	I	4	2		50.4	A	44.9	A
141	SR 84 (Liv) - SB	Stanley	Concannon	Liv	1.05	I	4	2		46.1	A	41.3	A
142	SR 84 (Liv) - SB	Concannon	Vineyard	Liv	0.60	I	4	2		43.0	A	33.4	B
143	SR 84 (Liv) - SB	Vineyard	Isabel/Vallecitos	Liv	1.12	I	4	2		42.9	A	46.4	A
144	SR 84 - WB	Isabel/Vallecitos	Ruby Hill /Kaithoff	Liv	0.38	I	4	2		36.3	A	45.1	A
145	SR 84 - WB	Ruby Hill /Kaithoff	Culvert (Lat/Long: 37.613854,-121.817224)	Pleas	1.62	Rural (55.8)	4	2		58.3	A	55.7	A
146	SR 84 - WB	Culvert (Lat/Long: 37.613854,-121.817224)	Vallecitos Nuc.Cntr	Unin	1.65	Rural (56.5)	4	2		57.5	A	54.7	A
147	SR 84 - WB	Vallecitos Nuc.Cntr	Vallecitos Ln	Unin	1.14	Rural (52.5)	3	2		54.9	A	53.4	A
148	SR 84 - WB	Vallecitos Ln	SR 84/I-680 NB On	Unin	0.21	Rural (55.3)	3	2		57.7	A	60.5	A
149	SR 84 - WB	SR 84/I-680 NB On	Ple-Sunol Rd	Fre	1.27	Rural (41.4)	3	2		43.4	A	43.3	A
150	SR 84 - WB	Ple-Sunol Rd	Sunol Rd	Fre	0.53	Rural (41.9)	3	2		39.9	A	41.5	A
151	SR 84 - WB	Sunol Rd	Niles Canyon Quarry	Fre	1.75	Rural (48.5)	3	2		46.9	A	46.6	A
152	SR 84 - WB	Niles Canyon Quarry	Fremont City Limit	Fre	1.00	Rural (47.5)	3	2		46.1	A	44.6	A
153	SR 84 - WB	Fremont City Limit	Union City Limit	Fre	2.10	Rural (41.8)	3	2		43.6	A	43.1	A
154	SR 84 - WB	Union City Limit	SR 238	Fre	1.62	Rural (31.7)	3	2		28.9	A	33.9	A
155	SR 92 - EB	I-880	Mission	Hay	1.59	II	2	3	'91 - '92	15.4	D	6.9	**(F)**
156	SR 92 - WB	Mission	I-880	Hay	1.59	II	2	3		23.4	C	23.7	C
157	SR 112 (Davis) - EB	Doolittle/Davis	I-880	SL	0.51	II	2	2		15.1	D	14.1	D
158	SR 112 (Davis) - EB	I-880	San Leandro	SL	1.01	II	2	2	'91	17.2	D	26.2	B
159	SR 112 (Davis) - EB	San Leandro	E 14th	SL	0.28	III	2	2		16.0	C	12.1	D
160	SR 112 (Davis) - WB	E 14th	San Leandro	SL	0.28	III	2	2		13.2	C	10.8	D
161	SR 112 (Davis) - WB	San Leandro	I-880	SL	1.00	II	2	2		25.1	B	25.6	B
162	SR 112 (Davis) - WB	I-880	Doolittle	SL	0.51	II	2	2		15.5	D	19.5	C
163	SR 123 San Pablo - SB	Carlson	Washington	Alb	0.53	II	1	2		25.5	B	23.8	C
164	SR 123 San Pablo - SB	Washington	Marin	Alb	0.44	III	1	2		17.1	C	14.7	C
165	SR 123 San Pablo - SB	Marin	Gilman	Alb - Berk	0.47	II	1	2		17.0	D	16.4	D
166	SR 123 San Pablo - SB	Gilman	University	Berk	0.86	II	1	2		18.3	C	16.4	D
167	SR 123 San Pablo - SB	University	Allston	Berk	0.20	III	1	2		18.6	C	13.6	C
168	SR 123 San Pablo - SB	Allston	Dwight	Berk	0.4	II	1			18.2	C	20.2	C
169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	0.68	II	1			20.2	C	13.6	E
170	SR 123 San Pablo - SB	Ashby	Stanford	Berk	0.81	II	1	2		17.8	D	17.2	D
171	SR 123 San Pablo - SB	Stanford	53rd	Oak	0.27	II	1	2		26.3	B	17.1	D

Appendix G-2: 2012 LOS Monitoring Study Results for Arterials—p.m. Peak Period

		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Juris	(miles)	Class[1]	Area	Lanes	(Years)	Speed	LOS	Speed	LOS
172	SR 123 San Pablo - SB	53rd	Park	Emer	0.34	II	1	2		18.0	D	17.6	D
173	SR 123 San Pablo - SB	Park	35th	Emer - Oak	0.45	II	1	2	'91	14.3	D	12.7	E
174	SR 123 San Pablo - NB	35th	Park	Oak - Emer	0.45	II	1	2		18.4	C	12.3	E
175	SR 123 San Pablo - NB	Park	53rd	Emer	0.34	II	1	2		28.5	B	22.9	C
176	SR 123 San Pablo - NB	53rd	Stanford	Oak	0.27	II	1	2	02	22.2	C	14.6	D
177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	0.81	II	1	2		19.0	C	15.0	D
178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	0.68	II	1			19.4	C	14.5	D
179	SR 123 San Pablo - NB	Dwight	Allston	Berk	0.4	II	1			24.9	B	23.9	C
180	SR 123 San Pablo - NB	Allston	University	Berk	0.20	III	1	2	'98, '00,06,10	5.8	**(F)**	5.4	**(F)**
181	SR 123 San Pablo - NB	University	Gilman	Berk	0.86	II	1	2		19.8	C	20.3	C
182	SR 123 San Pablo - NB	Gilman	Marin	Alb - Berk	0.47	II	1	2		15.7	D	13.4	E
183	SR 123 San Pablo - NB	Marin	Washington	Alb	0.45	III	1	2	08	24.1	B	23.6	B
184	SR 123 San Pablo - NB	Washington	Carlson	Alb	0.53	II	1	2		17.1	D	19.8	C
185	SR 185 (14th) - SB	42nd	46th St	Oak	0.26	II	1			16.8	D	15.1	D
186	SR 185 (14th) - SB	46th St	Seminary	Oak	0.79	II	1			23.8	C	21.6	C
187	SR 185 (14th) - SB	Seminary	73rd	Oak	0.80	II	1	2		13.2	E	10.2	E
188	SR 185 (14th) - SB	73rd Ave	98th Ave	Oak	1.39	II	1	2		20.4	C	18.1	C
189	SR 185 (14th) - SB	98th	Broadmoor	Oak	0.74	II	1	2		18.7	C	19.5	C
190	SR 185 (14th) - SB	Broadmoor	Davis	SL	0.73	II	2	2		15.9	D	19.2	C
191	SR 185 (14th) - SB	Davis	San Leandro	SL	1.04	III	2	2		17.2	C	19.3	B
192	SR 185 (14th) - SB	San L Blvd	Hesperian	SL	0.94	II	2	2		22.4	C	22.4	C
193	SR 185 (14th) - SB	Hesperian	Bayfair	SL	0.46	II	2	2		16.5	D	16.7	D
194	SR 185 (14th) - SB	Bayfair	170th	Unin	1.24	II	3	2		19.8	C	24.1	B
195	SR 185 (14th) - SB	170th	Llewelling	Unin	0.21	II	3	2		19.0	C	23.4	C
196	SR 185 (14th) - SB	Llewelling	Sunset	Unin	1.02	II	3	2		27.3	B	27.0	B
197	SR 185 Hayward - SB	Sunset	SR 92/238	Hay	0.84	III	2	2		11.4	D	9.0	E
198	SR 185 Hayward - NB	SR 92/238	Sunset	Hay	0.84	III	2	2		17.0	C	10.6	D
199	SR 185 (14th) - NB	Sunset	Llewelling	Unin	1.11	II	3	2		26.3	B	24.9	B
200	SR 185 (14th) - NB	Llewelling	170th	Unin	0.21	II	3	2		31.5	A	30.4	A
201	SR 185 (14th) - NB	170th	Bayfair	Unin	1.24	II	3	2		25.3	B	22.8	C
202	SR 185 (14th) - NB	Bayfair	Hesperian	SL	0.47	II	2	2		23.5	C	18.3	C
203	SR 185 (14th) - NB	Hesperian	San L Blvd	SL	0.94	II	2	2		22.8	C	28.1	B
204	SR 185 (14th) - NB	San Leandro	Davis	SL	1.02	III	2	2		15.6	C	15.7	C
205	SR 185 (14th) - NB	Davis	Broadmoor	SL	0.72	II	2	2		21.5	C	21.3	C
206	SR 185 (14th) - NB	Broadmoor	98th	Oak	0.74	II	1	2		16.2	D	15.0	D
207	SR 185 (14th) - NB	98th Ave	73rd Ave	Oak	1.37	II	1	2		18.2	C	13.9	E
208	SR 185 (14th) - NB	73rd Ave	Seminary	Oak	0.60	II	1	2		13.1	E	14.5	D
209	SR 185 (14th) - NB	Seminary	46th St	Oak	0.79	II	1			25.9	B	28.9	B
210	SR 185 (14th) - NB	46th St	42nd	Oak	0.26	II	1		08-10	7.3	**(F)**	8.7	**(F)**
211	SR 238 (Foothill) - NB	Jackson	City Center	Hay	0.62	III	2	3		17.3	C	6.4	**(F)**
212	SR 238 (Foothill) - NB	City Center	I-580	Unin-Hay	0.73	II	3	3		20.7	C	21.5	C
213	SR 238 (Foothill) - NB	I-580 Ramp	I-580 Merge	Unin	0.71	I	3			45.1	A	48.0	A
214	SR 238 (Foothill) - SB	I-580	Cstro V Blvd	Unin	0.86	I	3			47.3	A	43.7	A
215	SR 238 (Foothill) - SB	Cstro V Blvd	City Center	Hay-Unin	1.03	II	2	3		27.2	B	23.1	C
216	SR 238 (Foothill) - SB	City Center	Jackson	Hay	0.62	III	2	3		16.2	C	8.9	E

Appendix G-2: 2012 LOS Monitoring Study Results for Arterials—p.m. Peak Period

		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Juris	(miles)	Class[1]	Area	Lanes	(Years)	Speed	LOS	Speed	LOS
217	SR 238 (Mission) - NB	680 NB Rmp	Stevenson	Fre	2.46	I	3	2		41.4	A	29.1	B
218	SR 238 (Mission) - NB	Stevenson	Nursery	Fre	2.57	I	3	2		30.4	B	33.4	B
219	SR 238 (Mission) - NB	Nursery	Tamarack	UC	2.10	I	3	2		28.7	B	27.3	C
220	SR 238 (Mission) - NB	Tamarack	Industrial	UC-Hay	1.96	I	3	2		26.1	C	30.6	B
221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	1.47	II	2	2		27.1	B	21.5	C
222	SR 238 (Mission) - NB	Sorenson	Jackson	Hay	1.83	II	2	2		15.8	D	11.8	E
223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	1.83	II	2	2	'91 - '92	23.3	C	18.7	C
224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	1.47	II	2	2		22.4	C	22.5	C
225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay-UC	1.96	I	2	2		32.7	B	30.2	B
226	SR 238 (Mission) - SB	Tamarack	Nursery	UC	2.07	I	3	2		24.4	C	23.6	C
227	SR 238 (Mission) - SB	Nursery	Stevenson	Fre	2.57	I	3	2		30.5	B	33.6	B
228	SR 238 (Mission) - SB	Stevenson	680 NB Rmp	Fre	2.46	I	3	2		31.0	B	23.4	C
229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	1.31	I	1	2		34.7	A	36.5	A
230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	1.31	I	1	2	'91	31.6	A	33.5	A
231	SR 262 (Mission) - EB	I-880 NB	I-680 NB	Fre	1.33	I	3	2		16.1	E	17.8	D
232	SR 262 (Mission) - WB	I-680 NB	I-880 SB	Fre	1.11	I	3	2		25.6	C	30.6	B

[1] For roads classified as "Rural" roads, based on the guidelines from the 1985 Highway Capacity Manual, LOS 'A' is estimated to occur at the free flow speeds and LOS 'F' occurs when speeds drop below 50% of the free flow speeds. LOS 'B' to 'E' are calculated at even intervals between free flow speeds and LOS 'F' speeds.

Highlighted areas indicate segments with speed data based on less than the regular number of base runs (six runs for segments with LOS C and worse and four runs for LOS A&B segments in the prior and current years)

Appendix G-3

Appendix G-3: 2012 LOS Monitoring Study Results for Ramps and Special Segments—p.m. Peak Period

		Segment Limits			Plan	Length	No of	Free Flow	Prior LOS "F"	2010 LOS Results			2012 LOS Results	
#	CMP Route	From:	To:	Jurisdiction	Area	(miles)	Lanes	Speed	(Years)	# of runs	Speed	LOS	Speed	LOS
1	I-80/I-580 Interchange	I-80 SB	I-580 EB	Oak	1	0.30	1	38.0	91-92, 97-02	6	31.0	B	33.5	B
2	I-80/I-580 Interchange	I-580 WB	I-80 NB	Oak	1	0.41	1	40.0	91-92, 98	6	40.1	A	26.3	D
3	SR 24 WB/I-580 WB	SR 24 ON	I-580 OFF	Oak	1	0.69	2	Weaving	95	6	44.6	n/a	33.3	-
4	I-580/SR 24 Interchange	I-580 WB	SR-24 EB	Oak	1	0.51	2	45.0		6	25.4	E	22.8	E
5	I-580/SR 24 Interchange	SR-24 WB	I-580 EB	Oak	1	0.74	2	51.0	06	6	30.1	E	22.9	**(F)**
6	SR13/SR 24 Interchange	SR-13 NB	SR-24 EB	Oak	1	0.32	1	40.0	92-10	6	9.8	**(F)**	7.6	**(F)**
7	SR13/SR 24 Interchange	SR-24 WB	SR-13 SB	Oak	1	0.16	1	31.0		8	32.7	A	24.0	C
8	I-880/I-238 Interchange	I-880 SB	I-238 EB	SL	2	0.74	2	47.0	93-'95, '97	6	52.8	A	40.5	B
9	I-880/I-238 Interchange	I-238 WB	I-880 NB	SL	2	0.54	1	54.0		6	74.8	A	60.1	A
10	I-880/I-238 Interchange	I-880 NB	I-238 EB	SL	2	0.42	1	32.0		6	59.3	A	17.5	E
11	I-880/I-238 Interchange	I-238 WB	I-880 SB	SL	2	0.76	1	53.0		6	78.2	A	51.2	A
12	I-580 /I-238 Interchange	I-580 SB	I-238 EB	Hay	2	0.35	1	37.0		6	21.6	E	22.9	D
13	I-580 /I-238 Interchange	I-238 WB	I-580 NB	Hay	2	0.32	1	38.0		6	37.2	A	42.7	A
25	I-580/I-680 Interchange	I-580 EB	I-680 NB	Pleas	4	0.46	1	35.0		4	24.5	C	23.8	D
15	I-580/I-680 Interchange	I-580 EB	I-680 SB	Pleas	4	0.28	1	42.0		6	26.0	D	23.8	E
16	I-580/I-680 Interchange	I-680 NB	I-580 EB	Pleas	4	0.90	2	63.8	93	6	58.2	A	47.5	C
17	I-580/I-680 Interchange	I-680 NB	I-580 WB	Pleas	4	0.66	1	41.0		6	49.7	A	41.8	A
18	I-580/I-680 Interchange	I-580 WB	I-680 NB	Pleas	4	0.41	1	51.5		6	45.7	B	42.4	B
19	I-580/I-680 Interchange	I-580 WB	I-680 SB	Pleas	4	0.66	1	39.0	08	6	31.3	B	25.1	D
20	I-580/I-680 Interchange	I-680 SB	I-580 EB	Pleas	4	1.23	2	68.1	92,02	6	65.4	A	56.5	B
21	I-580/I-680 Interchange	I-680 SB	I-580 WB	Pleas	4	0.43	1	58.4	02	5	50.9	B	44.9	C
22	I-880/SR 260 Connection*	I-880 SB	SR-260 WB	Oak	1	0.99	1	32.0		8	17.2	E	21.0	D
23	I-880/SR 260 Connection	SR-260 EB	I-880 NB	Oak	1	0.36	1	35.0	98, 08-10	8	15.7	**(F)**	17.5	E

*Starting from the 2010 LOS Monitoring runs, the travel route has been changed to the correct route of I-880 SB ramp exit to 5th Street and then connecting to Webster Tube from Broadway/5th Street intersection under the I-880 bridge.

Highlighted areas indicate segments with speed data based on less than the regular number of base runs (six runs for segments with LOS C and worse and four runs for LOS A&B segments in the prior and current years)

Appendix G-4

Appendix G-4: 2012 LOS Monitoring Study Results for Freeways—a.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS F (Years)	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes		Speed	LOS	Speed	LOS
1	I-80 - EB	SF County Line	Toll Plaza	Oak	1	2.06	10		57.3	B	57.2	B
2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1	1.15	10		55.8	B	55.8	B
3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery - Berk	1	0.79	10		75.5	A	72.9	A
4	I-80 - EB	Powell	Ashby	Emery - Berk	1	0.67	10		54.6	C	51.2	C
5	I-80 - EB	Ashby	University	Emery - Berk	1	1.34	10		66.2	A	64.4	A
6	I-80 - EB	University	Jct I-580 (off)	Berk - Alb	1	1.51	10		66.2	A	62.4	A
7	I-80 - EB	Jct I-580 (off)	Central (on)	Berk - Alb	1	1.12	10		64.0	A	59.4	B
8	I-80 - WB	Central	Jct I-580	Berk - Alb	1	0.70	10	08	37.0	E	22.7	**(F30)**
9	I-80 - WB	Jct I-580	Univerity	Berk - Alb	1	1.49	10	08	33.3	E	24.9	**(F30)**
10	I-80 - WB	University	Ashby	Emery - Berk	1	1.36	10		50.9	C	47.7	D
11	I-80 - WB	Ashby	Powell	Emery - Berk	1	0.64	10		45.4	D	49.3	C
12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery - Berk	1	0.42	10		46.3	D	47.3	D
13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1	1.20	10	97-10	8.1	**(F10)**	6.0	**(F10)**
14	I-80 - WB	Toll Plaza	SF County	Oak	1	2.00	10	97-10	13.4	**(F20)**	17.8	**(F20)**
15	I-238 - EB	I-880	I-580	Uninc-San L	2	2.28	6		63.5	A	60.3	A
16	I-238 - WB	I-580	I-880	Uninc-San L	2	1.60	6	97-08	32.1	E	20.8	**(F30)**
17	I-580 - EB	I-580/I-238 changed fm (I-238/Fthl Off)	Grove	Unincorp	2	2.88	8		55.5	B	54.8	C
18	I-580 EB	Grove	Eden Canyon	Uninc - Pleas	4	2.17	8		64.6	A	67.3	A
19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc - Pleas	4	4.80	8		61.9	A	60.4	A
20	I-580 EB	San Ramon/ Foothill	I-680	Uninc - Pleas	4	0.77	8		68.9	A	63.7	A
21	I-580 EB	I-680	Hopyard	Plea	4	0.76	8		63.8	A	61.5	A
22	I-580 EB	Hopyard	Santa Rita	Plea	4	1.96	8		68.8	A	66.9	A
23	I-580 EB	Santa Rita	El Charro	Uninc-Pleas	4	1.24	8		68.4	A	67.8	A
24	I-580 EB	El Charro	SR 84/Airway Blvd.	Unincorp	4	1.52	8		67.8	A	66.9	A
25	I-580 EB	SR 84/Airway Blvd.	Portola	Unincorp	4	1.71	8		67.2	A	68.3	A
26	I-580 - EB	Portola	1st St	Liv	4	2.70	8		66.3	A	68.1	A
27	I-580 - EB	1st St	Greenville	Liv-Uninc	4	1.98	8		55.5	B	56.6	B
28	I-580 - EB	Greenville	N.Flynn	Uninc	4	1.50	8		43.2	D	42.8	D
29	I-580 - EB	N.Flynn	Grant Line	Uninc	4	3.19	8		50.4	C	50.6	C
30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	4	1.11	8		47.0	D	46.7	D
31	I-580 - WB	I-205 (SJ Co)	Grant Line	Liv - Uninc	4	0.89	8	04	36.0	E	36.7	E
32	I-580 - WB	Grant Line	N Flynn	Liv - Uninc	4	4.56	8	04	56.2	B	45.9	D
33	I-580 - WB	N Flynn	Greenville Rd	Liv - Uninc	4	2.34	8	04	56.9	B	36.6	E
34	I-580 - WB	Greenville Rd	1st St	Liv - Uninc	4	2.30	8	04,08-10	28.9	**(F30)**	23.8	**(F30)**
35	I-580 - WB	1st St	Portola Ave	Liv	4	2.52	8	08-10	29.4	**(F30)**	22.3	**(F30)**
36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv - Plea	4	1.76	8	04,08	42.4	D	37.4	E
37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Plea	4	1.78	8	04,08	46.9	D	40.9	E
38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	4	1.16	8	04,08	55.4	B	45.1	D
39	I-580 - WB	Tassajara Rd	I-680	Plea	4	2.87	8		62.9	A	49.1	C
40	I-580 - WB	I-680	San Ramon Rd	Plea - Uninc	4	0.69	8		62.8	A	64.4	A
41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea - Uninc	4	4.75	8		65.4	A	65.2	A

Appendix G-4: 2012 LOS Monitoring Study Results for Freeways—a.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS F (Years)	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes		Speed	LOS	Speed	LOS
42	I-580 - WB	Eden Canyon	Center St	Plea - Uninc	4	2.28	8		68.9	A	66.9	A
43	I-580 - WB	Center	I-580/238	Unincorp	2	1.94	8	02	50.5	C	47.5	D
44	I-580 - EB	I-80	I-980	Oak	1	1.24	8		49.8	C	49.0	C
45	I-580 - EB	I-980	Harrison	Oak	1	0.95	8		95.9	A	66.3	A
46	I-580 - EB	Harrison	Lakeshore	Oak	1	0.69	8		63.2	A	62.3	A
47	I-580 - EB	Lakeshore	Coolidge	Oak	1	2.25	8		66.0	A	67.6	A
48	I-580 - EB	Coolidge	SH 13 Off	Oak	1	2.15	8		68.3	A	67.7	A
49	I-580 - EB	SH 13 Off	MacArthur	Foothill	1	4.09	8		65.6	A	64.4	A
50	I-580 - EB	MacArthur	I-580/238	SL - Hay	2	4.33	8		66.5	A	66.4	A
51	I-580 - WB	I-238	Foothill/MacArthur	Oak -SL	2	4.42	8		63.0	A	74.1	A
52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak -SL	1	3.89	8		36.2	E	61.4	A
53	I-580 - WB	SH 13 Off	Fruitvale	Oak	1	2.36	8	08-10	24.6	**(F30)**	26.4	**(F30)**
54	I-580 - WB	Fruitvale	Harrison	Oak	1	2.21	8		33.7	E	36.6	E
55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1	1.16	8		37.4	E	46.8	D
56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1	0.69	8	02,06-10	13.7	**(F20)**	16.9	**(F20)**
57	I-580 - EB	Central	I-80 Jct	Alb	1	0.77	4		32.2	E	27.3	**(F30)**
58	I-580 - WB	I-80 Jct	Central	Alb	1	1.07	4		64.1	A	69.2	A
59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	3	2.20	6		71.2	A	65.5	A
60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	3	1.34	6		69.2	A	66.2	A
61	I-680 - NB	Durham Rd	Washington Blvd	Fre	3	1.54	6		65.6	A	65.9	A
62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	3	0.89	6		69.7	A	69.7	A
63	I-680 NB	SR 238/Mission	Vargas Rd	Unincorp	3	0.82	6		62.6	A	62.4	A
64	I-680 NB	Vargas Rd	Andrade Rd	Unincorp	3	2.64	6		66.0	A	65.2	A
65	I-680 NB	Andrade Rd	Calaveras	Unincorp	3	1.13	6		65.8	A	64.1	A
66	I-680 NB	Calaveras	Rt.84/Vallecitos	Unincorp	3	0.30	6		74.8	A	73.4	A
67	I-680 NB	SR 84	Sunol Blvd	Plea - Uninc	4	3.45	6		68.8	A	68.3	A
68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea - Uninc	4	1.52	6		66.2	A	64.6	A
69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	4	2.39	6		66.5	A	65.4	A
70	I-680 NB	Stoneridge Dr	I-580	Plea	4	0.84	6		70.6	A	70.3	A
71	I-680 - NB	I-580	Alcosta	Dub	4	1.83	6		60.6	A	47.9	D
72	I-680 - SB	Alcosta	I-580	Dub	4	1.84	6		68.3	A	67.5	A
73	I-680 SB	I-580	Stoneridge Dr	Plea	4	0.76	6		60.2	A	44.5	D
74	I-680 SB	Stoneridge Dr	Bernal	Plea	4	2.55	6		53.8	C	40.5	E
75	I-680 SB	Bernal Ave.	Sunol Blvd	Unincorp	4	1.31	6		35.7	E	27.5	**(F30)**
76	I-680 SB	Sunol Blvd.	SR 84	Unincorp	4	3.82	6		35.9	E	44.9	D
77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Unincorp	3	1.32	6		48.4	D	49.0	D
78	I-680 SB	Andrade Rd	Sheridon Rd	Unincorp	3	1.39	6		50.7	C	56.7	B
79	I-680 SB	Sheridon Rd	Vargas Rd	Unincorp	3	0.81	6		60.3	A	58.7	B
80	I-680 SB	Vargas Rd	SR 238/Mission	Unincorp	3	1.08	6		52.8	C	46.7	D
81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	3	1.04	6		54.6	C	50.3	C
82	I-680 - SB	Washington Blvd	Durham Rd	Fre	3	1.52	6		61.3	A	51.0	C
83	I-680 - SB	Durham Rd	Rt 2262/Mission	Fre	3	1.67	6		63.1	A	51.3	C
84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	3	2.19	6		59.9	B	63.0	A
85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	3	2.08	8		71.4	A	75.5	A

Appendix G-4: 2012 LOS Monitoring Study Results for Freeways—a.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS F (Years)	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes		Speed	LOS	Speed	LOS
86	I-880 - NB	SR262/Mission	AutoMall Pkwy	Fre	3	2.44	8		67.9	A	68.8	A
87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	3	1.54	8		67.8	A	68.2	A
88	I-880 - NB	Stevenson	Decoto	Fre	3	4.04	8		65.1	A	65.9	A
89	I-880 - NB	Decota	Alvarado Blvd	Fre - Un Cty	3	1.17	8		54.3	C	53.1	C
90	I-880 - NB	Alcarado Blvd	Alvarado-Niles Blvd	Fre- Uni Cty	3	1.17	8		33.8	E	45.8	D
91	I-880 - NB	Alv-Niles	Tennyson	Un Cty - Hay	3	2.65	8	06-10	22.7	**(F30)**	38.1	E
92	I-880 - NB	Tennyson	SR 92	Hay	2	1.14	8		44.6	D	64.5	A
93	I-880 - NB	SR 92	A St	Hay	2	1.52	8		53.1	C	53.1	C
94	I-880 - NB	A St	I-238 (Marina before 06)	Unincorp	2	1.82	8		61.9	A	57.9	B
95	I-880 - NB	I-880/I238 (split)	Marina Blvd	Oak -SL	2	2.66	8		40.6	E	34.3	E
96	I-880 - NB	Marina Blvd	SR 112/Davis	Oak - SL	2	0.79	8	10	25.0	**(F30)**	30.0	**(F30)**
97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - SL	2	1.88	8		34.7	E	29.8	**(F30)**
98	I-880 - NB	Hegenberger	High/42nd	Oak	1	2.47	8	10	26.1	**(F30)**	30.8	E
99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1	1.06	8	10	24.9	**(F30)**	33.2	E
100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	1	2.64	8		41.1	D	48.0	D
101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	1	2.38	8		61.8	A	63.7	A
102	I-880 - NB	I-880/I238 (split)	I-880/I-80 (merge)	Oak	1	1.40	8		64.1	A	65.1	A
103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1	1.63	8		67.5	A	67.5	A
104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	1	2.65	8		49.2	C	83.0	A
105	I-880 - SB	I-980	23rd	Oak	1	2.79	8		47.0	D	60.7	A
106	I-880 - SB	23rd St	High/42nd	Oak	1	1.35	8		78.9	A	56.7	B
107	I-880 - SB	High/42nd	Hegenberger	Oak	1	2.27	8		61.5	A	61.0	A
108	I-880 - SB	Hegenberger	SR 112/Davis	Oak - SL	1	1.69	8		57.3	B	60.6	A
109	I-880 - SB	SR 112/Davis	Marina Blvd	Oak - SL	1	0.87	8		69.2	A	72.2	A
110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak - SL	1	2.41	8		42.2	D	47.2	D
111	I-880 - SB	I-238 (Marina before 06)	A St	SL-Uninc	2	2.03	8	06-10	19.0	**(F20)**	22.4	**(F30)**
112	I-880 - SB	A St	Rt 92	Hay	2	1.81	8	10	25.1	**(F30)**	34.1	E
113	I-880 - SB	Rt 92	Tennyson	Hay	2	0.96	8		35.4	E	23.0	**(F30)**
114	I-880 - SB	Tennyson	Alv-Niles	Hay - UC	2	2.49	8	00	32.7	E	23.5	**(F30)**
115	I-880 - SB	Alvarado-Niles	Alvarado	UC - Fre	2	1.37	8	10	32.7	**(F30)**	24.6	**(F30)**
116	I-880 - SB	Alvarado	Decoto	UC - Fre	2	1.17	8		36.0	E	26.8	**(F30)**
117	I-880 - SB	Decoto	Stevenson	Fre	3	4.07	8	10	32.9	**(F30)**	20.2	**(F30)**
118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	2	1.26	8	04,06	47.5	D	35.5	E
119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2	3.04	8	04-08	54.3	C	32.3	E
120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	3	1.27	8	96-00,04	56.7	B	46.1	D
121	I-980 - WB	SR 24 @ 580	I-880	Oak	1	2.27	8		61.6	A	63.7	A
122	I-980 - EB	I-880	SR 24 @ 580	Oak	1	2.32	8		61.5	A	60.2	A
123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1	1.20	4		91.9	A	85.8	A
124	SR 13 - NB	Carson/Redwood (1) (off)	Joaguin Miller	Oak	1	1.09	4		45.2	D	39.4	E
125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1	1.77	4		33.3	E	35.4	E
126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1	1.57	4	06,10	28.8	**(F30)**	23.2	**(F30)**
127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1	1.66	4		58.6	B	55.9	B
128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1	2.04	4		71.9	A	72.0	A
129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1	1.34	4		61.4	A	62.6	A

Appendix G-4: 2012 LOS Monitoring Study Results for Freeways—a.m. Peak Period

		Segment Limits			Plan	Length	No of	Prior LOS F (Years)	2010 LOS Results		2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes		Speed	LOS	Speed	LOS
130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1	0.89	4		48.3	D	41.6	D
131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1	2.08	8		65.4	A	65.2	A
132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1	1.41	8	08-10	17.3	**(F20)**	18.3	**(F20)**
133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1	1.03	8		38.7	E	40.2	E
134	SR 24 - WB	Fisch Ranch Road (CC)	Caldecott (exit)	Oak	1	0.99	8		49.4	C	50.2	C
135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1	1.77	8		64.3	A	60.3	A
136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1	2.19	8		50.2	C	49.2	C
137	SR 84 - EB	San M CL	Toll Plaza	Fremont	3	2.97	6		55.0	C	53.9	C
138	SR 84 - EB	Toll Plaza	Thornton	Fremont	3	0.27	6		57.7	B	58.3	B
139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	Newark	3	1.23	6		64.8	A	65.9	A
140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	Newark	3	0.97	6		39.9	E	41.8	D
141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark		3	0.99	6		46.5	D	42.7	D
142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy		3	1.15	6		35.6	E	36.3	E
143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate		3	0.75	6	10	22.1	**(F30)**	31.0	E
144	SR 84 - WB	Toll Plaza	San M CL	Fremont	2	3.17	6		65.1	A	60.7	A
145	SR 92 - EB	San M CL	Toll Plaza	Uninc - Hay	2	2.61	6		64.6	A	65.6	A
146	SR 92 - EB	Toll Plaza	Clawiter	Uninc - Hay	2	1.76	6		60.2	A	62.1	A
147	SR 92 - EB	Clawiter	I-880	Hay	2	2.10	6		55.9	B	67.8	A
148	SR 92 - WB	I-880	Clawiter	Hay	2	2.01	6	02	51.0	C	55.1	B
149	SR 92 - WB	Clawiter	Toll Plaza	Uninc - Hay	2	1.87	6	02	42.9	D	35.7	E
150	SR 92 - WB	Toll Plaza	San M CL	Uninc - Hay	2	2.61	6	02	61.9	A	59.0	B

Appendix G-5

Appendix G-5: 2012 LOS Monitoring Study Results for Arterials—a.m. Peak Period

#	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Arterial Class[1]	Plan Area	No of Lanes	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
		From	To							Speed	LOS	Speed	LOS
1	150th St - EB	Hesperian	I-580	SL	0.49	II	2	2		18.5	C	15.5	D
2	150th St - WB	I-580	Hesperian	SL	0.49	II	2	2		14.9	D	14.9	D
3	A Street - EB	I-880	Western	Hay	1.08	II	2	2		21.7	C	24.0	C
4	A Street - EB	Western	SR 238	Hay	0.53	III	2	2		10.3	D	7.5	E
5	A Street - WB	SR 238	Western	Hay	0.53	III	2	2		14.0	C	11.4	D
6	A Street - WB	Western	I-880	Hay	1.08	II	2	2		25.6	B	18.2	C
7	Atlantic - EB	Main	Webster	Ala	0.80	II	1	2		21.4	C	23.9	C
8	Atlantic - WB	Webster	Main	Ala	0.80	II	1	2		27.1	B	28.0	B
9	Hegenberger - EB	SR 61	Edgewater	Oak	0.76	I	1	3		22.8	C	18.5	D
10	Hegenberger - EB	Edgewater	Baldwin	Oak	0.73	I	1	3		24.8	C	24.9	C
11	Hegenberger - EB	Baldwin	E 14th	Oak	1.03	I	1	3		29.3	B	28.5	B
12	Hegenberger - WB	E 14th	Baldwin	Oak	1.03	I	1	3		39.6	A	35.1	A
13	Hegenberger - WB	Baldwin	Edgewater	Oak	0.73	I	1	3		25.4	C	22.0	C
14	Hegenberger - WB	Edgewater	SR 61	Oak	0.76	I	1	3		21.5	D	20.9	D
15	Hesperian - NB	Tennyson	SH 92 - WB	Hay	0.47	I	2	3		15.7	E	17.8	D
16	Hesperian - NB	SH 92	La Playa	Hay	0.79	II	2	3		25.9	B	23.4	C
17	Hesperian - NB	La Playa	W.Winton Ave.	Hay	0.44	II	2	3		25.8	B	15.7	D
18	Hesperian - NB	W.Winton Ave	A St	Hay	0.96	II	2	3		26.4	B	25.2	B
19	Hesperian - NB	A St	Hacienda	Unin	0.65	II	2	2		24.3	C	25.4	B
20	Hesperian - NB	Hacienda	Grant	Unin	0.65	II	2	2		26.9	B	30.8	A
21	Hesperian - NB	Grant	Llewelling	Unin	0.28	II	2	2	10	10.0	**(F)**	9.9	**(F)**
22	Hesperian - NB	Llewelling	Springlake	Unin	0.40	II	2	2		30.5	B	24.2	B
23	Hesperian - NB	Springlake	Fairmont	SL	0.66	II	2	2		18.5	C	20.1	C
24	Hesperian - NB	Fairmont	14th	SL	0.32	II	2	2		17.3	D	18.0	D
25	Hesperian - SB	14th	Fairmont	SL	0.31	II	2	2		12.9	E	17.8	D
26	Hesperian - SB	Fairmont	Springlake	SL	0.65	II	2	2		27.0	B	22.2	C
27	Hesperian - SB	Springlake	Llewelling	Unin	0.40	II	2	2		14.3	D	10.6	E
28	Hesperian - SB	Llewelling	Grant	Unin	0.28	II	2	2		14.5	D	15.2	D
29	Hesperian - SB	Grant	Hacienda	Unin	0.65	II	2	2		21.6	C	26.9	B
30	Hesperian - SB	Hacienda	A St	Unin	0.65	II	2	2		20.8	C	17.0	D
31	Hesperian - SB	A St	W.Winton Ave.	Hay	0.96	II	2	3		15.5	D	22.1	C
32	Hesperian - SB	W.Winton Ave	La Playa	Hay	0.44	II	2	3		25.8	B	18.7	C
33	Hesperian - SB	La Playa	SH 92	Hay	0.79	II	2	3		17.2	C	18.2	C
34	Hesperian - SB	SH 92 - WB	Tennyson	Hay	0.47	I	2	3		16.2	D	13.6	E
35	Mowry - EB	I-880	Farwell	Fre	0.34	II	3	2		17.6	D	19.9	C
36	Mowry - EB	Farwell	SH 84	Fre	2.63	II	3	2		29.4	B	26.8	B
37	Mowry - WB	SH 84	Farwell	Fre	2.63	II	3	2		24.9	B	27.1	B
38	Mowry - WB	Farwell	I-880	Fre	0.34	II	3	2		24.0	B	22.7	C
39	Park/23rd - EB	Encinal	Santa Clara	Ala	0.23	III	1	2		13.2	C	22.1	B

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#	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Arterial Class[1]	Plan Area	No of Lanes	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
		From	To							Speed	LOS	Speed	LOS
40	Park/23rd - EB	Santa Clara	Kennedy	Ala	0.66	III	1	2		11.9	D	12.3	D
41	Park/23rd - EB	Kennedy	E 11th	Ala - Oak	0.49	II	1	2		17.2	D	16.5	D
42	Park/23rd - WB	E 11th	Kennedy	Ala - Oak	0.45	II	1	2		23.7	C	24.8	B
43	Park/23rd - WB	Kennedy	Santa Clara	Ala	0.66	III	1	2		13.1	C	15.4	C
44	Park/23rd - WB	Santa Clara	Encinal	Ala	0.23	III	1	2		22.0	B	12.4	D
45	MLK Jr Way - NB	SH 24	Adeline	Oak	0.90	II	1	2		24.9	B	22.9	C
46	Adeline - NB	MLK Jr - South	MLK Jr - North	Berk	0.30	II	1	2		18.6	C	12.9	E
47	Adeline - NB	MLK Jr - North	Shattuck	Berk	0.63	II	1	2		17.7	D	20.5	C
48	Shattuck NB	Adeline	Dwight	Berk	0.32	II	1	2		23.7	C	23.5	C
49	Shattuck NB	Dwight	University	Berk	0.63	III	1	2		24.2	B	18.9	C
50	Shattuck SB	University	Dwight	Berk	0.63	III	1	2		17.9	C	15.4	C
51	Shattuck SB	Dwight	Adeline	Berk	0.32	II	1	2		30.1	A	29.4	B
52	Adeline - SB	Shattuck	MLK Jr - North	Berk	0.63	II	1	2		18.6	C	17.0	D
53	Adeline - SB	MLK Jr - North	MLK Jr - South	Berk	0.30	II	1	2		15.6	D	19.0	C
54	MLK Jr Way - SB	Adeline	SH 24	Oak	0.88	II	1	2		21.8	C	19.1	C
55	Tennyson - EB	Hesperian	I-880	Hay	0.88	I	2	2		21.0	D	21.8	D
56	Tennyson - EB	I-880 NB	Rt 238	Hay	1.55	II	2	2		20.7	C	20.9	C
57	Tennyson - WB	Rt 238	I-880	Hay	1.63	II	2	2		17.5	D	18.1	C
58	Tennyson - WB	I-880	Hesperian	Hay	0.85	I	2	2		16.0	E	22.3	C
59	University - EB	I-80 SB	6th	Berk	0.40	II	1	2		25.3	B	20.8	C
60	University - EB	6th	San Pablo	Berk	0.31	II	1	2		20.2	C	17.5	D
61	University - EB	San Pablo	Sacramento	Berk	0.56	II	1	2		12.7	E	19.6	C
62	University - EB	Sacramento	ML King	Berk	0.48	II	1	2		16.0	D	18.8	C
63	University - EB	ML King	Shattuck Pl	Berk	0.30	III	1	2		25.6	A	18.0	C
64	University - WB	Shattuck Pl	ML King	Berk	0.30	III	1	2		17.3	C	17.3	C
65	University - WB	ML King	Sacramento	Berk	0.48	II	1	2		20.9	C	19.9	C
66	University - WB	Sacramento	San Pablo	Berk	0.56	II	1	2		19.4	C	20.0	C
67	University - WB	San Pablo	6th	Berk	0.31	II	1	2		15.4	D	20.3	C
68	University - WB	6th	I-80 SB	Berk	0.40	II	1	2		37.3	A	38.6	A
69	SR 13 Ashby - WB	Hiller	Domingo	Oak - Berk	0.79	II	1	2		20.8	C	19.3	C
70	SR 13 Ashby - WB	Domingo	College	Berk	0.50	III	1	1		15.0	C	14.4	C
71	SR 13 Ashby - WB	College	Telegraph	Berk	0.38	III	1	1		20.4	B	18.0	C
72	SR 13 Ashby - WB	Telegraph	Shattuck	Berk	0.38	III	1	1		20.1	B	13.1	C
73	SR 13 Ashby - WB	Shattuck	ML King	Berk	0.24	III	1	1		10.3	D	9.3	D
74	SR 13 Ashby - WB	ML King	San Pablo	Berk	0.87	III	1	1		18.0	C	18.3	C
75	SR 13 Ashby - WB	San Pablo	I-80 Ramps	Berk	0.64	II	1	2		19.1	C	16.8	D
76	SR 13 Ashby - EB	I-80	San Pablo	Berk	0.61	II	1	2		19.7	C	19.5	C
77	SR 13 Ashby - EB	San Pablo	ML King	Berk	0.87	III	1	1		19.7	B	19.0	C
78	SR 13 Ashby - EB	ML King	Shattuck	Berk	0.24	III	1	1		12.6	D	10.6	D
79	SR 13 Ashby - EB	Shattuck	Telegraph	Berk	0.38	III	1	1		21.4	B	18.5	C
80	SR 13 Ashby - EB	Telegraph	College	Berk	0.38	III	1	1		18.8	C	21.3	B
81	SR 13 Ashby - EB	College	Domingo	Berk	0.50	III	1	1		19.7	B	20.7	B

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#	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Arterial Class[1]	Plan Area	No of Lanes	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
		From	To							Speed	LOS	Speed	LOS
82	SR 13 Ashby - EB	Domingo	Hiller	Berk - Oak	0.79	II	1	2		28.7	B	30.2	A
83	SR 61 - SB	Atlantic	Cent/Webster	Ala	0.55	III	1	2		16.5	C	17.3	C
84	SR 61 - SB	Cent/Webster	Sher/Encino	Ala	0.73	II	1	2		20.8	C	19.4	C
85	SR 61 - SB	Sher/Encino	Park	Ala	1.22	II	1	1		21.4	C	21.4	C
86	SR 61 - SB	Park	High/Otis	Ala	1.06	II	1	1		23.4	C	24.7	B
87	SR 61 (Doolittle) - SB	High	Island Dr	Ala	0.41	II	1	2		16.4	D	21.9	C
88	SR 61 (Doolittle) - SB	Island Dr	Harbor Bay	Ala	0.50	I	1	2		30.4	B	36.6	A
89	SR 61 - SB	Harbor Bay	Airport Dr	Oak	2.15	I	1	1		35.5	A	32.6	B
90	SR 61 (Doolittle) - SB	Airport	Davis	Oak - SL	0.95	I	1	2		40.6	A	27.6	C
91	SR 61 (Doolittle) - NB	Davis	Airport	SL - Oak	0.95	I	2	2		32.8	B	36.1	A
92	SR 61 - NB	Airport Dr	Harbor Bay	Ala	2.15	I	1	1		40.8	A	36.6	A
93	SR 61 (Doolittle) - NB	Harbor Bay	Island Dr	Ala	0.50	I	1	2		31.0	A	25.9	B
94	SR 61 (Doolittle) - NB	Island Dr	High/Otis	Ala	0.41	II	1	2		21.6	C	12.3	E
95	SR 61 - NB	High/Otis	Park	Ala	1.06	II	1	1		24.0	C	25.0	B
96	SR 61 - NB	Park/Encnal	Sher/Cent	Ala	1.22	II	1	1		20.5	C	15.5	D
97	SR 61 - NB	Sher/Cent	Web/Cent	Ala	0.73	II	1	2		23.0	C	23.1	C
98	SR 61 - NB	Cent/Web	Atlantic	Ala	0.55	III	1	2		11.6	D	15.6	C
99	SR 77 (42nd) - EB	I-880 NB	E 14th	Oak	0.32	I	1	2		29.9	B	Data not collected due to construction	
100	SR 77 (42nd) - WB	E 14 th	I-880 NB	Oak	0.30	I	1	2		32.7	B		
101	Decoto - WB	SH 238/Mission	Union Square	UC	0.85	II	3	2		16.5	D	20.2	C
102	Decoto - WB	Union Square	Alv-Niles Rd	UC	0.25	II	3	2		17.1	C	23.5	C
103	Decoto - WB	Alv-Niles Rd	Fremont CL	UC	0.66	II	3	2		24.9	B	22.7	C
104	Decoto - WB	Fremont CL	I-880 NB (off)	Fre	1.15	II	3	2		15.2	D	11.1	E
105	Decoto - EB	I-880 NB (off)	Union City CL	Fre	1.15	II	3	2		24.5	B	26.9	B
106	Decoto - EB	Union City CL	Alv-Niles Rd	UC	0.66	II	3	2		17.7	D	21.9	C
107	Decoto - EB	Alv-Niles Rd	Union Square	UC	0.25	II	3	2		17.1	D	11.8	E
108	Decoto - EB	Union Square	SH 238/Mission	UC	0.85	II	3	2		18.2	C	17.6	D
109	SR 84/Mowry (Fre)-WB	SH 238	Peralta	Fre	0.78	I	3			31.9	B	32.0	C
110	SR 84/Peralta (Fre)-WB	Mowry	Fremont	Fre	1.66	I	3			28.0	C	29.2	B
111	SR 84/Fremont(Fre)-WB	Peralta	Thornton	Fre	0.33	II	3			9.8	**(F)**	9.5	**(F)**
112	SR 84/Thornton(Fre)-WB	Fremont	I-880 SB	Fre	1.29	II	3			23.6	C	23.4	C
113	SR 84/Thornton (Fre)-EB	I-880 SB	Fremont	Fre	1.29	II	3	4		22.5	C	25.3	B
114	SR 84/Fremont (Fre)-EB	Thornton	Peralta	Fre	0.32	II	3	4		11.4	E	11.8	E
115	SR 84/Peralta (Fre) - EB	Fremont	Mowry	Fre	1.64	I	3	2		28.8	B	25.1	C
116	SR 84/Mowry (Fre) - EB	Peralta	SH 238	Fre	0.87	I	3	4(2)		23.0	C	20.9	D
117	1st Street - SB	I-580 Off	N Mines	Liv	0.61	I	4			21.3	D	25.1	C
118	1st Street - SB	N Mines	Inman	Liv	1.05	I	4			39.4	A	29.0	B
119	1st Street - NB	Inman	N Mines	Liv	1.05	I	4			34.8	B	31.7	B
120	1st Street - NB	N Mines	I-580 Off	Liv	0.61	I	4			29.6	B	30.2	B
121	SR 84 - EB	SR 238/Mission	Union City Limit	Fre	1.59	Rural (41.9)	3	2		40.5	A	38.9	A
122	SR 84 - EB	Union City Limit	Palamores	Fre	0.94	Rural (44.5)	3	2		43.2	A	42.6	A
123	SR 84 - EB	Palamoras	Niles Cnyn Quarry	Fre	2.16	Rural (43.8)	3	2		43.2	A	40.7	A

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		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Jurisdiction	(miles)	Class[1]	Area	Lanes		Speed	LOS	Speed	LOS
124	SR 84 - EB	Niles Cnyn Quarry	Sunol Rd	Fre	1.75	Rural (46.7)	3	2		47.3	A	44.8	A
125	SR 84 - EB	Sunol Rd	Plea-Sunol Rd	Fre	0.53	Rural (27.6)	3	2		19.2	D	9.3	**(F)**
126	SR 84 - EB	Ple-Sunol Rd	SR 84 (Off)/I-680	Unin	0.77	Rural (42.9)	4	2		40.9	A	40.3	A
127	SR 84 - EB	SR 84 (Off)/I-680	Vallecitos Ln	Unin	1.07	Rural (50.8)	4	2		44.9	B	48.1	A
128	SR 84 - EB	Vallecitos Ln	Vallecitos Nuc.Cntr	Unin	1.14	Rural (57.5)	4	2		56.9	A	53.6	A
129	SR 84 - EB	Vallecitos Nuc Center Ent.	Culvert (Lat/Long: 37.613854,-121.817224)	Unin	1.65	Rural (58.3)	4	2		57.4	A	55.2	A
130	SR 84 - EB	Culvert (Lat/Long: 37.613854,-121.817224)	Ruby Hill /Kaithoff	Unin	1.62	Rural (59.2)	4	2		57.4	A	55.7	A
131	SR 84 - EB	Ruby Hill./Kaithoff	Isabel/Vallecitos	Unin	0.38	I	4	2		37.2	A	38.5	A
132	SR 84 (Liv) - NB	Vallecitos/Isabel	Vineyard	Liv	1.12	I	4	2		44.6	A	41.8	A
133	SR 84 (Liv) - NB	Vineyard	Concannon	Liv	0.60	I	4	2		43.0	A	32.3	B
134	SR 84 (Liv) - NB	Concannon	Stanley	Liv	1.07	I	4	2		40.3	A	37.1	A
135	SR 84 (Liv) - NB	Stanley	W. Jack London Blvd.	Liv	0.88	I	4	2		41.2	A	38.4	A
136	SR 84 (Liv) - NB	W. Jack London Blvd.	Airway/Kitty Hawk	Liv	0.49	I	4	2		19.5	D	17.6	D
137	SR 84 (Liv) - NB	Airway/Kitty	I-580	Liv	1.06	I	4	2		26.6	C	32.6	B
138	SR 84 (Liv) - SB	I-580	Airway/Kitty Hawk	Liv	1.06	I	4	2		28.7	B	34.1	B
139	SR 84 (Liv) - SB	Airway/Kitty	W. Jack London Blvd.	Liv	0.49	I	4	2		36.7	A	32.3	B
140	SR 84 (Liv) - SB	W. Jack London Blvd.	Stanley	Liv	0.90	I	4	2		48.0	A	45.7	A
141	SR 84 (Liv) - SB	Stanley	Concannon	Liv	1.05	I	4	2		40.5	A	36.0	A
142	SR 84 (Liv) - SB	Concannon	Vineyard	Liv	0.60	I	4	2		22.8	C	28.0	C
143	SR 84 (Liv) - SB	Vineyard	Isabel/Vallecitos	Liv	1.12	I	4	2		18.9	D	14.6	E
144	SR 84 - WB	Isabel/Vallecitos	Ruby Hill /Kaithoff	Liv	0.38	I	4	2		39.7	A	36.5	A
145	SR 84 - WB	Ruby Hill /Kaithoff	Culvert (Lat/Long: 37.613854,-121.817224)	Pleas	1.62	Rural (55.8)	4	2		47.4	B	18.1	**(F)**
146	SR 84 - WB	Culvert (Lat/Long: 37.613854,-121.817224)	Vallecitos Nuc.Cntr	Unin	1.65	Rural (56.5)	4	2		45.4	B	41.8	C
147	SR 84 - WB	Vallecitos Nuc.Cntr	Vallecitos Ln	Unin	1.14	Rural (52.5)	3	2		52.0	A	51.3	A
148	SR 84 - WB	Vallecitos Ln	SR 84/I-680 NB Off	Unin	0.21	Rural (55.3)	3	2		57.1	A	54.7	A
149	SR 84 - WB	SR 84/I-680 NB Off	Ple-Sunol Rd	Fre	1.27	Rural (41.4)	3	2		38.0	B	34.6	B
150	SR 84 - WB	Ple-Sunol Rd	Sunol Rd	Fre	0.53	Rural (41.9)	3	2		41.9	A	41.7	A
151	SR 84 - WB	Sunol Rd	Niles Canyon Quarry	Fre	1.75	Rural (48.5)	3	2		46.9	A	47.7	A
152	SR 84 - WB	Niles Canyon Quarry	Fremont City Limit	Fre	1.00	Rural (47.5)	3	2		45.4	A	47.6	A
153	SR 84 - WB	Fremont City Limit	Union City Limit	Fre	2.10	Rural (41.8)	3	2		42.5	A	44.6	A
154	SR 84 - WB	Union City Limit	SR 238	Fre	1.62	Rural (31.7)	3	2		28.4	B	24.4	C
155	SR 92 - EB	I-880	Mission	Hay	1.59	II	2	3		18.4	C	18.8	C
156	SR 92 - WB	Mission	I-880	Hay	1.59	II	2	3		16.6	D	19.1	C
157	SR 112 (Davis) - EB	Doolittle	I-880	SL	0.51	II	2	2		31.2	A	23.5	C
158	SR 112 (Davis) - EB	I-880	San Leandro	SL	1.01	II	2	2		24.5	B	22.3	C
159	SR 112 (Davis) - EB	San Leandro	14th	SL	0.28	III	2	2		14.5	C	15.4	C
160	SR 112 (Davis) - WB	E 14th	San Leandro	SL	0.28	III	2	2		14.0	C	12.9	D
161	SR 112 (Davis) - WB	San Leandro	I-880	SL	1.00	II	2	2		29.0	B	29.3	B

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		Segment Limits			Length	Arterial	Plan	No of	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
#	CMP Route	From	To	Jurisdiction	(miles)	Class[1]	Area	Lanes		Speed	LOS	Speed	LOS
162	SR 112 (Davis) - WB	I-880	Doolittle	SL	0.51	II	2	2		21.5	C	21.1	C
163	SR 123 San Pablo - SB	Carlson	Washington	Alb	0.53	II	1	2		30.4	B	24.3	B
164	SR 123 San Pablo - SB	Washington	Marin	Alb	0.44	III	1	2		19.6	C	15.5	C
165	SR 123 San Pablo - SB	Marin	Gilman	Alb - Berk	0.47	II	1	2		24.2	C	24.6	B
166	SR 123 San Pablo - SB	Gilman	University	Berk	0.86	II	1	2		18.7	D	16.6	D
167	SR 123 San Pablo - SB	University	Allston	Berk	0.20	III	1	2		23.2	B	29.0	A
168	SR 123 San Pablo - SB	Allston	Dwight	Berk	0.4	II	1	2		25.0	B	22.3	C
169	SR 123 San Pablo - SB	Dwight	Ashby	Berk	0.68	II	1	2		27.6	B	23.2	C
170	SR 123 San Pablo - SB	Ashby	Stanford	Berk	0.81	II	1	2		23.1	C	22.5	C
171	SR 123 San Pablo - SB	Stanford	53rd	Oak	0.27	II	1	2		25.8	B	21.2	C
172	SR 123 San Pablo - SB	53rd	Park	Emer	0.34	II	1	2		24.9	C	19.6	C
173	SR 123 San Pablo - SB	Park	35th	Emer - Oak	0.45	II	1	2		21.4	C	18.3	C
174	SR 123 San Pablo - NB	35th	Park	Oak - Emer	0.45	II	1	2		20.9	C	16.3	D
175	SR 123 San Pablo - NB	Park	53rd	Emer	0.34	II	1	2		24.0	B	23.6	C
176	SR 123 San Pablo - NB	53rd	Stanford	Oak	0.27	II	1	2		27.9	B	33.5	A
177	SR 123 San Pablo - NB	Stanford	Ashby	Oak	0.81	II	1	2		25.9	B	20.6	C
178	SR 123 San Pablo - NB	Ashby	Dwight	Berk	0.68	II	1	2		32.1	A	28.4	B
179	SR 123 San Pablo - NB	Dwight	Allston	Berk	0.4	II	1	2		30.9	A	30.9	A
180	SR 123 San Pablo - NB	Allston	University	Berk	0.20	III	1	2		17.2	C	21.8	B
181	SR 123 San Pablo - NB	University	Gilman	Berk	0.86	II	1	2		31.0	A	26.7	B
182	SR 123 San Pablo - NB	Gilman	Marin	Alb - Berk	0.47	II	1	2		26.4	C	32.5	A
183	SR 123 San Pablo - NB	Marin	Washington	Alb	0.45	III	1	2		37.7	A	24.8	B
184	SR 123 San Pablo - NB	Washington	Carlson	Alb	0.53	II	1	2		29.7	A	28.3	B
185	SR 185 (14th) - SB	42nd	46th St	Oak	0.26	II	1			16.7	D	21.9	C
186	SR 185 (14th) - SB	46th St	Seminary	Oak	0.79	II	1			25.4	B	29.6	B
187	SR 185 (14th) - SB	Seminary	73rd	Oak	0.80	II	1	2		15.5	D	12.1	E
188	SR 185 (14th) - SB	73rd Ave	98th Ave	Oak	1.39	II	1	2		21.1	C	21.8	C
189	SR 185 (14th) - SB	98th	Broadmoor	Oak	0.74	II	1	2		25.9	B	24.5	B
190	SR 185 (14th) - SB	Broadmoor	Davis	SL	0.73	II	2	2		22.4	C	22.1	C
191	SR 185 (14th) - SB	Davis	San Leandro	SL	1.04	III	2	2		20.2	B	21.8	B
192	SR 185 (14th) - SB	San L Blvd	Hesperian	SL	0.94	II	2	2		23.1	C	22.5	C
193	SR 185 (14th) - SB	Hesperian	Bayfair	SL	0.46	II	2	2		22.2	C	28.9	B
194	SR 185 (14th) - SB	Bayfair	170th	Unin	1.24	II	3	2		24.8	B	25.1	B
195	SR 185 (14th) - SB	170th	Llewelling	Unin	0.21	II	3	2		21.2	C	25.2	B
196	SR 185 (14th) - SB	Llewelling	Sunset	Unin	1.02	II	3	2		22.7	C	23.4	C
197	SR 185 Hayward - SB	Sunset	SR 92/238	Hay	0.84	III	2	2		17.3	C	12.8	D
198	SR 185 Hayward - NB	SR 92/238	Sunset	Hay	0.84	III	2	2		20.2	B	17.0	C
199	SR 185 (14th) - NB	Sunset	Llewelling	Unin	1.11	II	3	2		24.8	B	25.5	B
200	SR 185 (14th) - NB	Llewelling	170th	Unin	0.21	II	3	2		29.7	B	22.5	C
201	SR 185 (14th) - NB	170th	Bayfair	Unin	1.24	II	3	2		26.3	B	26.4	B
202	SR 185 (14th) - NB	Bayfair	Hesperian	SL	0.47	II	2	2		29.5	B	26.0	B
203	SR 185 (14th) - NB	Hesperian	San L Blvd	SL	0.94	II	2	2		22.4	C	23.7	C

Appendix G-5: 2012 LOS Monitoring Study Results for Arterials—a.m. Peak Period

#	CMP Route	Segment Limits		Jurisdiction	Length (miles)	Arterial Class[1]	Plan Area	No of Lanes	Prior LOS "F"	2010 LOS Results		2012 LOS Results	
		From	To							Speed	LOS	Speed	LOS
204	SR 185 (14th) - NB	San Leandro	Davis	SL	1.02	III	2	2		13.5	C	19.3	B
205	SR 185 (14th) - NB	Davis	Broadmoor	SL	0.72	II	2	2		23.4	C	23.5	C
206	SR 185 (14th) - NB	Broadmoor	98th	Oak	0.74	II	1	2		20.7	C	16.0	D
207	SR 185 (14th) - NB	98th Ave	73rd Ave	Oak	1.37	II	1	2		19.4	C	20.2	C
208	SR 185 (14th) - NB	73rd Ave	Seminary	Oak	0.60	II	1	2		13.6	E	10.8	E
209	SR 185 (14th) - NB	Seminary	46th St	Oak	0.79	II	1			24.2	B	29.8	B
210	SR 185 (14th) - NB	46th St	42nd	Oak	0.26	II	1		10	7.2	**(F)**	8.8	**(F)**
211	SR 238 (Foothill) - NB	Jackson	City Center	Hay	0.62	III	2	3		14.4	C	10.6	D
212	SR 238 (Foothill) - NB	City Center	I-580	Unin-Hay	0.73	II	3	3		30.9	A	19.5	C
213	SR 238 (Foothill) - NB	I-580 Ramp	I-580 Merge	Unin	0.71	I	3			47.6	A	48.0	A
214	SR 238 (Foothill) - SB	I-580	Cstro V Blvd	Unin	0.86	I	3			64.0	A	46.4	A
215	SR 238 (Foothill) - SB	Cstro V Blvd	City Center	Hay-Unin	1.03	II	2	3		17.6	D	23.8	C
216	SR 238 (Foothill) - SB	City Center	Jackson	Hay	0.62	III	2	3		11.7	D	11.3	D
217	SR 238 (Mission) - NB	680 NB Rmp	Stevenson	Fre	2.46	I	3	2		35.5	A	37.2	A
218	SR 238 (Mission) - NB	Stevenson	Nursery	Fre	2.57	I	3	2		43.0	A	38.2	A
219	SR 238 (Mission) - NB	Nursery	Tamarack	UC	2.10	I	3	2		31.6	B	29.8	B
220	SR 238 (Mission) - NB	Tamarack	Industrial	UC - Hay	1.96	I	3	2		31.9	B	31.8	B
221	SR 238 (Mission) - NB	Industrial	Sorenson	Hay	1.47	II	2	2		30.1	A	24.4	B
222	SR 238 (Mission) - NB	Sorenson	Jackson	Hay	1.83	II	2	2		25.6	B	20.2	C
223	SR 238 (Mission) - SB	Jackson	Sorenson	Hay	1.83	II	2	2		26.0	B	18.1	C
224	SR 238 (Mission) - SB	Sorenson	Industrial	Hay	1.47	II	2	2		24.1	B	20.4	C
225	SR 238 (Mission) - SB	Industrial	Tamarack	Hay - UC	1.96	I	2	2		33.4	B	31.7	B
226	SR 238 (Mission) - SB	Tamarack	Nursery	UC	2.07	I	3	2		25.3	C	22.5	C
227	SR 238 (Mission) - SB	Nursery	Stevenson	Fre	2.57	I	3	2		30.0	B	29.8	B
228	SR 238 (Mission) - SB	Stevenson	680 NB Rmp	Fre	2.46	I	3	2		24.1	C	28.5	B
229	SR 260 (Tubes) - NB	Atlantic	7th/Web	Oak	1.31	I	1	2		34.7	A	18.0	C
230	SR 260 (Tubes) - SB	7th/Web	Atlantic	Oak	1.31	I	1	2		14.5	C	15.4	C
231	SR 262 (Mission) - EB	I-880 NB	I-680 NB	Fre	1.33	I	3	2		25.9	C	28.7	B
232	SR 262 (Mission) - WB	I-680 NB	I-880 SB	Fre	1.11	I	3	2		21.3	D	21.6	D

[1] For roads classified as "Rural" roads, based on the guidelines from the 1985 Highway Capacity Manual, LOS 'A' is estimated to occur at the free flow speeds and LOS 'F' occurs when speeds drop below 50% of the free flow speeds. LOS 'B' to 'E' are calculated at even intervals between free flow speeds and LOS 'F' speeds.

Highlighted areas indicate segments with speed data based on less than the regular number of base runs (six runs for segments with LOS C and worse and four runs for LOS A&B segments in the prior and current years)

Appendix G-6

Appendix G-6: 2012 LOS Monitoring Study Results for Ramps and Special Segments—a.m. Peak Period

#	CMP Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	No of Lanes	Free Flow Speed	2010 LOS Results		2012 LOS Results	
		From:	To:						Speed	LOS	Speed	LOS
1	I-80/I-580 Interchange	I-80 SB	I-580 EB	Oak	1	0.30	1	38.0	49.9	A	32.5	B
2	I-80/I-580 Interchange	I-580 WB	I-80 NB	Oak	1	0.41	1	40.0	32.4	B	34.1	B
3	SR 24 WB/I-580 WB	SR 24 ON	I-580 OFF	Oak	1	0.69	2	Weaving	29.7	N/A	36.5	N/A
4	I-580/SR 24 Interchange	I-580 WB	SR-24 EB	Oak	1	0.51	2	45.0	36.7	B	34.1	C
5	I-580/SR 24 Interchange	SR-24 WB	I-580 EB	Oak	1	0.74	2	51.0	52.7	A	49.8	A
6	SR13/SR 24 Interchange**	SR-13 NB	SR-24 EB	Oak	1	0.32	1	40.0	**5.2**	**(F)**	27.8	D
7	SR13/SR 24 Interchange	SR-24 WB	SR-13 SB	Oak	1	0.16	1	31.0	32.0	A	23.5	C
8	I-880/I-238 Interchange	I-880 SB	I-238 EB	SL	2	0.74	2	47.0	49.9	A	50.7	A
9	I-880/I-238 Interchange	I-238 WB	I-880 NB	SL	2	0.54	1	54.0	32.7	D	51.7	A
10	I-880/I-238 Interchange	I-880 NB	I-238 EB	SL	2	0.42	1	32.0	61.5	A	44.9	A
11	I-880/I-238 Interchange	I-238 WB	I-880 SB	SL	2	0.76	1	53.0	47.2	B	36.8	D
12	I-580 /I-238 Interchange	I-580 SB	I-238 EB	Hay	2	0.35	1	37.0	21.5	E	22.8	D
13	I-580 /I-238 Interchange	I-238 WB	I-580 NB	Hay	2	0.32	1	38.0	37.6	A	41.5	A
14	I-580/I-680 Interchange	I-580 EB	I-680 NB	Pleas	4	0.46	1	35.0	24.0	D	21.5	D
15	I-580/I-680 Interchange	I-580 EB	I-680 SB	Pleas	4	0.28	1	42.0	26.0	D	21.7	E
16	I-580/I-680 Interchange	I-680 NB	I-580 EB	Pleas	4	0.90	2	63.8	60.6	A	55.1	B
17	I-580/I-680 Interchange	I-680 NB	I-580 WB	Pleas	4	0.66	1	41.0	47.5	A	35.7	B
18	I-580/I-680 Interchange	I-580 WB	I-680 NB	Pleas	4	0.41	1	51.5	45.0	B	45.6	B
19	I-580/I-680 Interchange	I-580 WB	I-680 SB	Pleas	4	0.66	1	39.0	28.2	C	25.9	D
20	I-580/I-680 Interchange	I-680 SB	I-580 EB	Pleas	4	1.23	2	68.1	59.8	B	55.4	B
21	I-580/I-680 Interchange	I-680 SB	I-580 WB	Pleas	4	0.43	1	58.4	53.4	A	46.9	B
22	I-880/SR 260 Connection*	I-880 SB	SR-260 WB	Oak	1	0.99	1	32.0	24.0	C	21.4	D
23	I-880/SR 260 Connection	SR-260 EB	I-880 NB	Oak	1	0.36	1	35.0	18.8	E	15.5	**(F)**

*Starting from the 2010 LOS Monitoring runs, the travel route has been changed to the correct route of I-880 SB ramp exit to 5th Street and then connecting to Webster Tube from Broadway/5th Street intersection under the I-880 bridge.

Highlighted areas indicate segments with speed data based on less than the regular number of base runs (six runs for segments with LOS C and worse and four runs for LOS A&B segments in the prior and current years)

Appendix G-7

Appendix G-7: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—p.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results	
		From	To				# Runs	Speed*
1	W.Grand Ave - Grand Ave -EB	I-80/Maritime St	San Pablo Ave	Oakland	1	1.09	7	13.9
2	W.Grand Ave - Grand Ave -EB	San Pablo Ave	Broadway	Oakland	1	0.40	7	10.8
3	W.Grand Ave - Grand Ave -EB	Broadway	I-580	Oakland	1	1.62	7	24.3
4	W.Grand Ave - Grand Ave -WB	I-580	Broadway	Oakland	1	1.62	5	23.9
5	W.Grand Ave - Grand Ave -WB	Broadway	San Pablo Ave	Oakland	1	0.40	6	12.0
6	W.Grand Ave - Grand Ave -WB	San Pablo Ave	I-80/Maritime St	Oakland	1	1.09	6	11.4
7	12th St - Lakeshore Ave-EB	I-980 OFF Ramp/Brush St	Webster	Oakland	1	0.46	6	17.8
8	12th St - Lakeshore Ave-EB	Webster	Lake Merritt Blvd	Oakland	1	0.59	6	20.7
9	12th St - Lakeshore Ave-EB	Lake Merritt Blvd	MacArthur Blvd/I-580 ON Ramp	Oakland	1	1.30	6	17.0
10	12th St - Lakeshore Ave-WB	MacArthur Blvd/I-580 ON Ramp	Lake Merritt Blvd	Oakland	1	1.20	8	17.7
11	12th St - Lakeshore Ave-WB	Lake Merritt Blvd	Webster	Oakland	1	0.61	6	24.3
12	12th St - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oakland	1	0.51	6	14.2
13	Telegraph Ave-NB	51st Street	Russell St	Oakland, Berkeley	1	1.41	6	16.8
14	Telegraph Ave-NB	Russell St	Bancroft Way	Oakland, Berkeley	1	0.77	6	15.6
15	Telegraph Ave-SB	Bancroft Way	Russell St	Oakland, Berkeley	1	0.75	6	10.4
16	Telegraph Ave-SB	Russell St	51st Street	Oakland, Berkeley	1	1.50	6	16.0
17	Broadway-EB	Broadway/College Ave	Grand Ave	Oakland	1	1.91	6	14.3
18	Broadway-EB	Grand Ave	14th St	Oakland	1	0.55	6	10.4
19	Broadway-EB	14th St	5th St/Broadway	Oakland	1	0.48	6	8.3
20	Broadway-EB	5th St/Broadway	I-880 OFF Ramp	Oakland	1	0.06	6	11.3
21	Broadway-WB	I-880 OFF Ramp	5th St/Broadway	Oakland	1	0.07	6	23.0
22	Broadway-WB	5th St/Broadway	14th St	Oakland	1	0.48	6	12.5
23	Broadway-WB	14th St	Grand Ave	Oakland	1	0.55	6	16.0
24	Broadway-WB	Grand Ave	Broadway/College Ave	Oakland	1	1.91	6	15.7
25	College Avenue-EB	Bancroft Way/College Ave	Ashby Ave	Oakland	1	1.04	6	10.7
26	College Avenue-EB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oakland, Berkeley	1	0.83	6	10.3
27	College Avenue-EB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Berkeley	1	0.60	6	11.2
28	College Avenue-WB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Berkeley	1	0.60	6	16.1
29	College Avenue-WB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oakland, Berkeley	1	0.83	6	12.5
30	College Avenue-WB	Ashby Ave	Bancroft Way/College Ave	Oakland	1	0.98	6	15.9
31	Bancroft-EB	Shattuck	Bancroft Way/College Ave	Berkeley	1	0.48	6	16.1
32	Bancroft-WB	College Ave.	Shattuck	Berkeley	1	0.73	6	14.8
33	51st Street-EB	SR 24 Off Ramp/52nd St	Broadway	Oakland	1	0.81	6	12.5
34	51st Street-WB	Broadway	SR 24 Off Ramp/52nd St	Oakland	1	0.81	6	10.7
35	Shattuck Avenue-NB	51st	Alcatraz Ave.	Oakland, Berkeley	1	0.81	7	20.3
36	Shattuck Avenue-NB	Alcatraz Ave.	Adeline St.	Berkeley	1	0.69	7	13.8
37	Shattuck Avenue-SB	Adeline St.	Alcatraz Ave.	Berkeley	1	0.69	9	13.1
38	Shattuck Avenue-SB	Alcatraz Ave.	51st	Oakland, Berkeley	1	0.81	9	13.2
39	Powel Street-Stanford Avenue-EB	NB I-80 OFF Ramp	San Pablo Ave	Emeryville	1	0.75	6	14.3
40	Powel Street-Stanford Avenue-EB	San Pablo Ave	MLK Jr Way	Emeryville,Berkeley	1	0.76	6	16.1
41	Powel Street-Stanford Avenue-WB	MLK Jr Way	San Pablo Ave	Emeryville,Berkeley	1	0.76	6	17.2
42	Powel Street-Stanford Avenue-WB	San Pablo Ave	NB I-80 OFF Ramp	Emeryville	1	0.75	6	17.6
43	40thStreet-Shellmound Avenue-EB	Shellmound Way (north of Powell	40th St	Emeryville	1	0.82	6	20.1
44	40thStreet-Shellmound Avenue-EB	40th St	San Pablo Ave	Emeryville	1	0.64	6	12.4
45	40thStreet-Shellmound Avenue-WB	San Pablo Ave	40th St	Emeryville	1	0.64	6	20.1
46	40thStreet-Shellmound Avenue-WB	40th St	Shellmound Way (north of Powell	Emeryville	1	0.82	6	22.3
47	International Boulevard-NB	42nd Ave	Fruitvale Ave	Oakland	1	0.62	6	14.1

Appendix G-7: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—p.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results	
		From	To				# Runs	Speed*
48	International Boulevard-NB	Fruitvale Ave	14th Ave	Oakland	1	1.38	6	21.5
49	International Boulevard-NB	14th Ave	Lake Merrit Blvd	Oakland	1	0.88	6	17.5
50	International Boulevard-SB	Lake Merrit Blvd	14th Ave	Oakland	1	0.88	6	22.5
51	International Boulevard-SB	14th Ave	Fruitvale Ave	Oakland	1	1.38	6	18.7
52	International Boulevard-SB	Fruitvale Ave	42nd Ave	Oakland	1	0.62	6	8.0
53	Foothill Boulevard-NB	International Blvd/73rd Ave	73rd Ave/Foothill Blvd	Oakland	1	1.07	5	14.0
54	Foothill Boulevard-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oakland	1	1.01	5	19.1
55	Foothill Boulevard-NB	Seminary Ave	High Street	Oakland	1	1.22	5	20.5
56	Foothill Boulevard-NB	High Street	Fruitvale Ave	Oakland	1	0.89	5	14.0
57	Foothill Boulevard-NB	Fruitvale Ave	14th Ave	Oakland	1	1.32	5	20.4
58	Foothill Boulevard-NB	14th Ave	1st Ave/Lake Shore Blvd	Oakland	1	0.87	5	16.9
59	Foothill Boulevard-SB	1st Ave/Lake Shore Blvd	14th Ave	Oakland	1	0.99	6	16.9
60	Foothill Boulevard-SB	14th Ave	Fruitvale Ave	Oakland	1	1.30	6	17.2
61	Foothill Boulevard-SB	Fruitvale Ave	High Street	Oakland	1	0.89	6	14.1
62	Foothill Boulevard-SB	High Street	Seminary Ave	Oakland	1	1.22	6	18.2
63	Foothill Boulevard-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oakland	1	1.01	6	17.4
64	Foothill Boulevard-SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oakland	1	1.04	6	21.2
65	E. 15th Street-SB	1st Avenue	14th Avenue	Oakland	1	0.99	6	16.9
66	High Street-EB	Otis Drive	Central Ave	Alameda	1	0.58	8	21.0
67	High Street-EB	Central Ave	Fernside Blvd	Alameda	1	0.48	8	16.4
68	High Street-EB	Fernside Blvd	NB I-880 OFF Ramp	Alameda, Oakland	1	0.49	8	13.3
69	High Street-EB	NB I-880 OFF Ramp	Foothill Blvd	Oakland	1	0.62	8	11.3
70	High Street-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oakland	1	1.30	8	17.2
71	High Street-WB	MacArthur Blvd/WB I-580 OFF	Foothill Blvd	Oakland	1	1.73	8	22.8
72	High Street-WB	Foothill Blvd	NB I-880 OFF Ramp	Oakland	1	0.62	8	9.2
73	High Street-WB	NB I-880 OFF Ramp	Fernside Blvd	Alameda, Oakland	1	0.49	8	18.9
74	High Street-WB	Fernside Blvd	Central Ave	Alameda	1	0.48	8	19.5
75	High Street-WB	Central Ave	Otis Drive	Alameda	1	0.58	8	15.1
76	Crow Canyon Road-NB	A Street/Redwood Road	EB I-580 ON Ramp/Grove Way	Alameda County	2	0.93	7	31.5
77	Crow Canyon Road-NB	EB I-580 ON Ramp/Grove Way	Cull Canyon	Alameda County	2	0.83	7	26.0
78	Crow Canyon Road-NB	Cull Canyon	Cold Water Dr	Alameda County	2	0.89	6	38.4
79	Crow Canyon Road-NB	Cold Water Dr	New Checkpoint (Driver to identify)	Alameda County	2	1.48	6	40.8
80	Crow Canyon Road-NB	New Checkpoint (Driver to identify)	County Line	Alameda County	2	3.90	6	45.1
81	Crow Canyon Road-SB	County Line	New Checkpoint (Driver to identify)	Alameda County	2	3.90	6	41.7
82	Crow Canyon Road-SB	New Checkpoint (Driver to identify)	Cold Water Dr	Alameda County	2	1.48	6	30.9
83	Crow Canyon Road-SB	Cold Water Dr	Cull Canyon	Alameda County	2	0.89	6	26.8
84	Crow Canyon Road-SB	Cull Canyon	EB I-580 ON Ramp/Grove Way	Alameda County	2	0.83	6	24.5
85	Crow Canyon Road-SB	EB I-580 ON Ramp/Grove Way	A Street/Redwood Road	Alameda County	2	0.93	6	24.1
86	Winton Avenue - D Street-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hayward	2	0.41	6	19.6
87	Winton Avenue - D Street-EB	SB I-880 ON Ramp	Santa Clara St	Hayward	2	0.33	6	21.7
88	Winton Avenue - D Street-EB	Santa Clara St	Soto Rd	Hayward	2	0.55	6	13.0
89	Winton Avenue - D Street-EB	Soto Rd	Foothill Boulevard/D St	Hayward	2	0.91	6	8.8
90	Winton Avenue - D Street-WB	Foothill Boulevard/D St	Soto Rd	Hayward	2	0.91	6	16.2
91	Winton Avenue - D Street-WB	Soto Rd	Santa Clara St	Hayward	2	0.55	6	22.6
92	Winton Avenue - D Street-WB	Santa Clara St	SB I-880 ON Ramp	Hayward	2	0.33	6	39.6
93	Winton Avenue - D Street-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hayward	2	0.41	6	11.1
94	A Street-EB	Foothill Boulevard/A St	Redwood Rd/Grove Way	Hayward	2	0.80	6	20.5
95	A Street-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Hayward	2	0.41	6	23.2
96	A Street-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Hayward	2	0.41	7	25.0
97	A Street-WB	Redwood Rd/Grove Way	Foothill Boulevard/A St	Hayward	2	0.80	6	16.6
98	Hesperian Boulevard-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Union City	3	0.98	6	21.6

Appendix G-7: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—p.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results	
		From	To				# Runs	Speed*
99	Hesperian Boulevard-Union City Blvd-NB	Whipple Rd	Hesperian/Union City	Union City	3	0.30	6	22.9
100	Hesperian Boulevard-Union City Blvd-NB	Hesperian/Union City	Industrial Blvd	Union City	3	0.57	6	14.4
101	Hesperian Boulevard-Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Union City	3	1.04	6	19.3
102	Hesperian Boulevard-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Union City	3	1.03	6	26.5
103	Hesperian Boulevard-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City	Union City	3	0.57	6	17.6
104	Hesperian Boulevard-Union City Blvd-SB	Hesperian/Union City	Whipple Rd	Union City	3	0.30	6	29.9
105	Hesperian Boulevard-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Union City	3	0.98	6	24.0
106	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Union City	3	0.21	6	25.8
107	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Union City	3	1.42	6	22.6
108	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Union City	3	0.52	6	22.2
109	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Union City	3	0.52	6	23.7
110	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Union City	3	1.43	6	21.7
111	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Union City	3	0.21	6	23.4
112	Fremont Boulevard-NB	NB I-880 OFF Ramp	Automall Parkway	Fremont	3	1.27	6	31.8
113	Fremont Boulevard-NB	Automall Parkway	Blacow Rd	Fremont	3	0.90	6	32.7
114	Fremont Boulevard-NB	Blacow Rd	Adams Ave	Fremont	3	0.38	6	34.5
115	Fremont Boulevard-NB	Adams Ave	Stevenson Rd	Fremont	3	1.17	6	13.5
116	Fremont Boulevard-NB	Stevenson Rd	Mowry Ave	Fremont	3	1.00	6	23.2
117	Fremont Boulevard-NB	Mowry Ave	Peralta Blvd	Fremont	3	1.21	6	26.9
118	Fremont Boulevard-NB	Peralta Blvd	Thornton Ave	Fremont	3	0.32	6	19.8
119	Fremont Boulevard-NB	Thornton Ave	Decoto Rd	Fremont	3	1.34	6	18.1
120	Fremont Boulevard-NB	Decoto Rd	Paseo Padre Pkwy	Fremont	3	0.55	6	22.3
121	Fremont Boulevard-NB	Paseo Padre Pkwy	SB I-880 OFF Ramp	Fremont	3	0.61	6	26.6
122	Fremont Boulevard-SB	SB I-880 OFF Ramp	Paseo Padre Pkwy	Fremont	3	0.40	7	19.1
123	Fremont Boulevard-SB	Paseo Padre Pkwy	Decoto Rd	Fremont	3	0.55	7	19.7
124	Fremont Boulevard-SB	Decoto Rd	Thornton Ave	Fremont	3	1.34	7	30.2
125	Fremont Boulevard-SB	Thornton Ave	Peralta Blvd	Fremont	3	0.32	7	26.9
126	Fremont Boulevard-SB	Peralta Blvd	Mowry Ave	Fremont	3	1.21	7	21.2
127	Fremont Boulevard-SB	Mowry Ave	Stevenson Rd	Fremont	3	1.00	6	27.8
128	Fremont Boulevard-SB	Stevenson Rd	Adams Ave	Fremont	3	1.17	6	23.4
129	Fremont Boulevard-SB	Adams Ave	Blacow Rd	Fremont	3	0.38	6	25.3
130	Fremont Boulevard-SB	Blacow Rd	Automall Parkway	Fremont	3	0.90	6	26.5
131	Fremont Boulevard-SB	Automall Parkway	NB I-880 OFF Ramp	Fremont	3	1.25	6	37.7
132	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fremont	3	0.85	6	25.2
133	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fremont	3	0.75	6	29.4
134	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fremont	3	0.75	6	23.5
135	Automall Parkway-WB	Fremont Blvd	NB I-880 OFF Ramp	Fremont	3	0.77	6	28.3
136	Vasco Road-NB	WB I-580 OFF Ramp	Scenic Ave	Livermore	4	0.51	7	27.3
137	Vasco Road-NB	Scenic Ave	Dalton Ave/City-County Line	Livermore	4	0.69	7	13.6
138	Vasco Road-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Livermore	4	1.75	7	45.1
139	Vasco Road-NB	N. Vasco Rd/Vasco Rd	Local Road underpass/County Line	Livermore	4	2.80	7	54.9
140	Vasco Road-SB	Local Road underpass/County Line	N. Vasco Rd/Vasco Rd	Livermore	4	2.80	6	56.4
141	Vasco Road-SB	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Livermore	4	1.75	6	51.1
142	Vasco Road-SB	Dalton Ave/City-County Line	Scenic Ave	Livermore	4	0.69	6	30.4
143	Vasco Road-SB	Scenic Ave	WB I-580 OFF Ramp	Livermore	4	0.51	6	24.1
144	Dublin Blvd.-EB	San Ramon Road	Village Parkway	Dublin	4	0.73	6	25.3
145	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dublin	4	0.81	6	16.3
146	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dublin	4	1.20	6	29.8
147	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dublin	4	0.88	6	22.3
148	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dublin	4	0.88	6	26.2
149	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dublin	4	1.20	6	23.1

Appendix G-7: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—p.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results	
		From	To				# Runs	Speed*
150	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dublin	4	0.81	6	22.1
151	Dublin Blvd.-WB	Village Parkway	San Ramon Road	Dublin	4	0.73	6	15.9
152	San Ramon Road-NB	WB I-580 OFF ramp	Silvergate Dr	Dublin	4	0.67	6	22.7
153	San Ramon Road-NB	Silvergate Dr	Alcosta Blvd/Westside Dr/County	Dublin	4	0.98	6	29.3
154	San Ramon Road-SB	Alcosta Blvd/Westside Dr/County	Silvergate Dr	Dublin	4	0.98	6	33.1
155	San Ramon Road-SB	Silvergate Dr	WB I-580 OFF ramp	Dublin	4	0.67	6	18.0
156	Dougherty Road-NB	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dublin	4	1.15	6	20.3
157	Dougherty Road-NB	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dublin	4	0.78	6	43.0
158	Dougherty Road-SB	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dublin	4	0.78	6	30.4
159	Dougherty Road-SB	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dublin	4	1.15	6	25.7
160	Tassajara Road-NB	WB I-580 OFF ramp	Central Parkway	Dublin	4	0.60	6	24.9
161	Tassajara Road-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dublin	4	0.68	6	34.9
162	Tassajara Road-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dublin	4	1.05	6	36.3
163	Tassajara Road-NB	Fallon Rd	County Line	Alameda County	4	0.50	6	38.9
164	Tassajara Road-SB	County Line	Fallon Rd	Alameda County	4	0.50	6	39.3
165	Tassajara Road-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dublin	4	1.05	6	37.5
166	Tassajara Road-SB	Somerset Ln/N Dublin Ranch Dr	Central Parkway	Dublin	4	0.68	6	26.0
167	Tassajara Road-SB	Central Parkway	WB I-580 OFF ramp	Dublin	4	0.63	6	16.5
168	E. Stanley Blvd - Railroad Avenue - 1st	SR 84/Isabel Ave	Murrita Blvd	Pleasanton, Alameda	4	0.98	5	28.6
169	E. Stanley Blvd - Railroad Avenue - 1st	Murrita Blvd	S Livermore Ave	Livermore	4	1.07	5	23.1
170	E. Stanley Blvd - Railroad Avenue - 1st	S Livermore Ave	Inman St	Livermore	4	0.46	5	22.2
171	E. Stanley Blvd - Railroad Avenue - 1st	Inman St	S Livermore Ave	Livermore	4	0.46	6	14.6
172	E. Stanley Blvd - Railroad Avenue - 1st	S Livermore Ave	Murrita Blvd	Livermore	4	1.07	6	17.4
173	E. Stanley Blvd - Railroad Avenue - 1st	Murrita Blvd	SR 84/Isabel Ave	Pleasanton, Alameda	4	0.98	6	39.8
174	Stoneridge Drive-EB	NB I-680 OFF Ramp	Hopyard Rd	Pleasanton	4	0.93	6	25.2
175	Stoneridge Drive-EB	Hopyard Rd	Hacienda Dr	Pleasanton	4	0.49	6	36.8
176	Stoneridge Drive-EB	Hacienda Dr	W. Las Positas Blvd	Pleasanton	4	0.64	6	25.9
177	Stoneridge Drive-EB	W. Las Positas Blvd	Santa Rita Road	Pleasanton	4	0.43	6	12.0
178	Stoneridge Drive-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Pleasanton	4	0.29	6	15.2
179	Stoneridge Drive-EB	W. Los Positas Blvd	EB I-580 ON	Pleasanton	4	0.77	6	32.3
180	Stoneridge Drive-WB	EB I-580 ON	W. Los Positas Blvd	Pleasanton	4	0.74	6	32.6
181	Stoneridge Drive-WB	W. Los Positas Blvd	Santa Rita Road	Pleasanton	4	0.29	6	35.2
182	Stoneridge Drive-WB	Santa Rita Road	W. Las Positas Blvd	Pleasanton	4	0.43	6	19.7
183	Stoneridge Drive-WB	W. Las Positas Blvd	Hacienda Dr	Pleasanton	4	0.64	6	24.9
184	Stoneridge Drive-WB	Hacienda Dr	Hopyard Rd	Pleasanton	4	0.49	6	19.4
185	Stoneridge Drive-WB	Hopyard Rd	NB I-680 OFF Ramp	Pleasanton	4	0.66	6	29.2
186	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Pleasanton	4	1.22	7	24.8
187	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Pleasanton	4	0.64	7	21.6
188	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Pleasanton	4	0.84	7	26.1
189	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Pleasanton, Alameda	4	2.91	7	43.5
190	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Pleasanton, Alameda	4	2.91	6	44.6
191	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Pleasanton	4	0.85	6	24.9
192	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Pleasanton	4	0.63	6	15.6
193	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave	NB I-680 OFF	Pleasanton	4	1.23	6	34.2

* Upon completion of Free Flow Speed Survey in Fall 2012, classification of the Tier 2 roadways will be determined and the service levels (LOS letters) based on the classification and 2012 speed will be reported.

Highlighted areas indicate segments with speed data based on less than the regular six base runs

Appendix G-8

Appendix G-8: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—a.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results*	
		From	To				# Runs	Speed
1	W.Grand Ave - Grand Ave -EB	I-80/Maritime St	San Pablo Ave	Oakland	1	1.09	5	17.9
2	W.Grand Ave - Grand Ave -EB	San Pablo Ave	Broadway	Oakland	1	0.40	5	20.1
3	W.Grand Ave - Grand Ave -EB	Broadway	I-580	Oakland	1	1.62	5	25.8
4	W.Grand Ave - Grand Ave -WB	I-580	Broadway	Oakland	1	1.62	8	24.4
5	W.Grand Ave - Grand Ave -WB	Broadway	San Pablo Ave	Oakland	1	0.40	9	14.8
6	W.Grand Ave - Grand Ave -WB	San Pablo Ave	I-80/Maritime St	Oakland	1	1.09	9	18.0
7	12th St - Lakeshore Ave-EB	I-980 OFF Ramp/Brush St	Webster	Oakland	1	0.46	6	16.3
8	12th St - Lakeshore Ave-EB	Webster	Lake Merritt Blvd	Oakland	1	0.59	7	23.1
9	12th St - Lakeshore Ave-EB	Lake Merritt Blvd	MacArthur Blvd/I-580 ON Ramp	Oakland	1	1.24	7	17.5
10	12th St - Lakeshore Ave-WB	MacArthur Blvd/I-580 ON Ramp	Lake Merritt Blvd	Oakland	1	1.20	6	17.7
11	12th St - Lakeshore Ave-WB	Lake Merritt Blvd	Webster	Oakland	1	0.61	6	17.6
12	12th St - Lakeshore Ave-WB	Webster	I-980 OFF Ramp/Brush St	Oakland	1	0.51	6	19.2
13	Telegraph Ave-NB	51st Street	Russell St	Oakland, Berkeley	1	1.31	8	16.4
14	Telegraph Ave-NB	Russell St	Bancroft Way	Oakland, Berkeley	1	0.81	8	19.9
15	Telegraph Ave-SB	Bancroft Way	Russell St	Oakland, Berkeley	1	0.75	7	15.8
16	Telegraph Ave-SB	Russell St	51st Street	Oakland, Berkeley	1	1.50	7	20.7
17	Broadway-SB	Broadway/College Ave	Grand Ave	Oakland	1	1.91	6	16.2
18	Broadway-SB	Grand Ave	14th St	Oakland	1	0.55	7	12.5
19	Broadway-SB	14th St	5th St/Broadway	Oakland	1	0.48	7	11.8
20	Broadway-SB	5th St/Broadway	I-880 OFF Ramp	Oakland	1	0.06	3	14.4
21	Broadway-NB	I-880 OFF Ramp	5th St/Broadway	Oakland	1	0.07	6	23.0
22	Broadway-NB	5th St/Broadway	14th St	Oakland	1	0.48	6	12.5
23	Broadway-NB	14th St	Grand Ave	Oakland	1	0.55	6	16.0
24	Broadway-NB	Grand Ave	Broadway/College Ave	Oakland	1	1.91	6	15.7
25	Durant-EB	Shattuck	College Ave.	Berkeley	1	0.73	7	14.4
26	College Avenue-SB	Bancroft Way/College Ave	Ashby Ave	Oakland	1	0.79	7	13.2
27	College Avenue-SB	Ashby Ave	Miles Ave/SR 24 OFF Ramp	Oakland, Berkeley	1	0.83	6	15.7
28	College Avenue-SB	Miles Ave/SR 24 OFF Ramp	Broadway/College Ave	Berkeley	1	0.60	6	16.0
29	College Avenue-NB	Broadway/College Ave	Miles Ave/SR 24 OFF Ramp	Berkeley	1	0.60	6	16.1
30	College Avenue-NB	Miles Ave/SR 24 OFF Ramp	Ashby Ave	Oakland, Berkeley	1	0.83	6	12.5
31	College Avenue-NB	Ashby Ave	Bancroft Way/College Ave	Oakland	1	0.98	6	15.9
32	Bancroft-WB	College Ave.	Shattuck	Berkeley	1	0.73	6	14.8
33	51st Street-EB	SR 24 Off Ramp/52nd St	Broadway	Oakland	1	0.81	6	15.4
34	51st Street-WB	Broadway	SR 24 Off Ramp/52nd St	Oakland	1	0.00	6	16.9
35	Shattuck Avenue-NB	51st	Alcatraz Ave.	Oakland, Berkeley	1	0.81	10	22.4
36	Shattuck Avenue-NB	Alcatraz Ave.	Adeline St.	Berkeley	1	0.70	10	18.4
37	Shattuck Avenue-SB	Adeline St.	Alcatraz Ave.	Berkeley	1	0.70	9	18.8
38	Shattuck Avenue-SB	Alcatraz Ave.	51st	Oakland, Berkeley	1	0.81	9	14.5
39	Powel Street-Stanford Avenue-EB	NB I-80 OFF Ramp	San Pablo Ave	Emeryville	1	0.75	7	14.4
40	Powel Street-Stanford Avenue-EB	San Pablo Ave	MLK Jr Way	Emeryville,Berkeley	1	0.76	7	17.8
41	Powel Street-Stanford Avenue-WB	MLK Jr Way	San Pablo Ave	Emeryville,Berkeley	1	0.76	6	16.7
42	Powel Street-Stanford Avenue-WB	San Pablo Ave	NB I-80 OFF Ramp	Emeryville	1	0.75	6	21.2
43	40thStreet-Shellmound Avenue-EB	Shellmound Way (north of Powell St)	40th St	Emeryville	1	0.82	6	26.8
44	40thStreet-Shellmound Avenue-EB	40th St	San Pablo Ave	Emeryville	1	0.64	6	16.9
45	40thStreet-Shellmound Avenue-WB	San Pablo Ave	40th St	Emeryville	1	0.64	6	25.2
46	40thStreet-Shellmound Avenue-WB	40th St	Shellmound Way (north of Powell St)	Emeryville	1	0.82	6	28.3

Appendix G-8: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—a.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results*	
		From	To				# Runs	Speed
47	International Boulevard-NB	42nd Ave	Fruitvale Ave	Oakland	1	0.62	6	21.7
48	International Boulevard-NB	Fruitvale Ave	14th Ave	Oakland	1	1.38	6	26.6
49	International Boulevard-NB	14th Ave	Lake Merritt Blvd	Oakland	1	0.88	6	21.2
50	International Boulevard-SB	Lake Merritt Blvd	14th Ave	Oakland	1	0.88	6	20.8
51	International Boulevard-SB	14th Ave	Fruitvale Ave	Oakland	1	1.38	6	24.4
52	International Boulevard-SB	Fruitvale Ave	42nd Ave	Oakland	1	0.62	6	18.9
53	Foothill Boulevard-NB	International Blvd/73rd Ave	73rd Ave/Foothill Blvd	Oakland	1	1.07	6	18.4
54	Foothill Boulevard-NB	73rd Ave/Foothill Blvd	Seminary Ave	Oakland	1	1.01	6	18.5
55	Foothill Boulevard-NB	Seminary Ave	High Street	Oakland	1	1.22	6	20.0
56	Foothill Boulevard-NB	High Street	Fruitvale Ave	Oakland	1	0.89	6	12.1
57	Foothill Boulevard-NB	Fruitvale Ave	14th Ave	Oakland	1	1.32	6	20.9
58	Foothill Boulevard-NB	14th Ave	1st Ave/Lake Shore Blvd	Oakland	1	0.87	6	16.2
59	Foothill Boulevard-SB	1st Ave/Lake Shore Blvd	14th Ave	Oakland	1	0.99	6	19.1
60	Foothill Boulevard-SB	14th Ave	Fruitvale Ave	Oakland	1	1.30	6	18.6
61	Foothill Boulevard-SB	Fruitvale Ave	High Street	Oakland	1	0.89	6	15.8
62	Foothill Boulevard-SB	High Street	Seminary Ave	Oakland	1	1.22	6	21.0
63	Foothill Boulevard-SB	Seminary Ave	73rd Ave/Foothill Blvd	Oakland	1	1.01	6	21.0
64	Foothill Boulevard-SB	73rd Ave/Foothill Blvd	International Blvd/73rd Ave	Oakland	1	1.04	6	21.3
65	E. 15th Street-SB	1st Avenue	14th Avenue	Oakland	1	0.99	6	19.1
66	High Street-EB	Otis Drive	Central Ave	Alameda	1	0.58	8	18.2
67	High Street-EB	Central Ave	Fernside Blvd	Alameda	1	0.48	8	13.2
68	High Street-EB	Fernside Blvd	NB I-880 OFF Ramp	Alameda, Oakland	1	0.49	8	12.5
69	High Street-EB	NB I-880 OFF Ramp	Foothill Blvd	Oakland	1	0.62	8	11.5
70	High Street-EB	Foothill Blvd	MacArthur Blvd/WB I-580 OFF Ramp	Oakland	1	1.30	8	18.9
71	High Street-WB	MacArthur Blvd/WB I-580 OFF Ramp	Foothill Blvd	Oakland	1	1.73	8	28.1
72	High Street-WB	Foothill Blvd	NB I-880 OFF Ramp	Oakland	1	0.62	8	9.1
73	High Street-WB	NB I-880 OFF Ramp	Fernside Blvd	Alameda, Oakland	1	0.49	8	18.3
74	High Street-WB	Fernside Blvd	Central Ave	Alameda	1	0.48	8	19.9
75	High Street-WB	Central Ave	Otis Drive	Alameda	1	0.58	8	14.1
77	Crow Canyon Road-NB	A Street/Redwood Road	EB I-580 ON Ramp/Grove Way	Alameda County	2	0.93	7	31.6
78	Crow Canyon Road-NB	EB I-580 ON Ramp/Grove Way	Cull Canyon	Alameda County	2	0.83	7	20.3
79	Crow Canyon Road-NB	Cull Canyon	Cold Water Dr	Alameda County	2	0.89	7	34.1
80	Crow Canyon Road-NB	Cold Water Dr	New Checkpoint (Driver to identify)	Alameda County	2	1.48	7	41.9
81	Crow Canyon Road-NB	New Checkpoint (Driver to identify)	County Line	Alameda County	2	3.90	7	43.9
82	Crow Canyon Road-SB	County Line	New Checkpoint (Driver to identify)	Alameda County	2	3.90	6	45.8
83	Crow Canyon Road-SB	New Checkpoint (Driver to identify)	Cold Water Dr	Alameda County	2	1.48	6	44.8
84	Crow Canyon Road-SB	Cold Water Dr	Cull Canyon	Alameda County	2	0.89	6	29.3
85	Crow Canyon Road-SB	Cull Canyon	EB I-580 ON Ramp/Grove Way	Alameda County	2	0.83	6	22.8
86	Crow Canyon Road-SB	EB I-580 ON Ramp/Grove Way	A Street/Redwood Road	Alameda County	2	0.93	6	21.6
87	Winton Avenue - D Street-EB	Hesperian Blvd.	SB I-880 ON Ramp	Hayward	2	0.41	6	25.8
88	Winton Avenue - D Street-EB	SB I-880 ON Ramp	Santa Clara St	Hayward	2	0.33	6	18.7
89	Winton Avenue - D Street-EB	Santa Clara St	Soto Rd	Hayward	2	0.55	6	19.4
90	Winton Avenue - D Street-EB	Soto Rd	Foothill Boulevard/D St	Hayward	2	0.91	6	10.7
91	Winton Avenue - D Street-WB	Foothill Boulevard/D St	Soto Rd	Hayward	2	0.91	6	16.0
92	Winton Avenue - D Street-WB	Soto Rd	Santa Clara St	Hayward	2	0.55	6	22.9
93	Winton Avenue - D Street-WB	Santa Clara St	SB I-880 ON Ramp	Hayward	2	0.33	6	18.7
94	Winton Avenue - D Street-WB	SB I-880 ON Ramp	Hesperian Blvd.	Hayward	2	0.41	6	25.5
95	A Street-EB	Foothill Boulevard/A St	Redwood Rd/Grove Way	Hayward	2	0.80	6	17.3
96	A Street-EB	Redwood Rd/Grove Way	EB I-580 ON Ramp/Grove Way	Hayward	2	0.41	6	24.4
97	A Street-WB	EB I-580 ON Ramp/Grove Way	Redwood Rd/Grove Way	Hayward	2	0.41	6	19.1

Appendix G-8: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—a.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results*	
		From	To				# Runs	Speed
98	A Street-WB	Redwood Rd/Grove Way	Foothill Boulevard/A St	Hayward	2	0.80	6	8.9
99	Hesperian Boulevard-Union City Blvd-NB	Union City/Alvarado Blvd	Whipple Rd	Union City	3	0.98	6	23.1
100	Hesperian Boulevard-Union City Blvd-NB	Whipple Rd	Hesperian/Union City Blvd/overbridge	Union City	3	0.30	6	34.2
101	Hesperian Boulevard-Union City Blvd-NB	Hesperian/Union City Blvd/overbridge	Industrial Blvd	Union City	3	0.57	6	22.6
102	Hesperian Boulevard-Union City Blvd-NB	Industrial Blvd	Tennyson/Hesperian	Union City	3	1.04	6	22.8
103	Hesperian Boulevard-Union City Blvd-SB	Tennyson/Hesperian	Industrial Blvd	Union City	3	1.03	6	24.4
104	Hesperian Boulevard-Union City Blvd-SB	Industrial Blvd	Hesperian/Union City Blvd/overbridge	Union City	3	0.57	6	23.9
105	Hesperian Boulevard-Union City Blvd-SB	Hesperian/Union City Blvd/overbridge	Whipple Rd	Union City	3	0.30	6	26.9
106	Hesperian Boulevard-Union City Blvd-SB	Whipple Rd	Union City/Alvarado Blvd	Union City	3	0.98	6	23.6
108	Alvarado Blvd.-NB	NB I-880 ON Ramp	Deep Creek Rd/SB I-880 OFF Ramp	Union City	3	0.21	6	26.5
109	Alvarado Blvd.-NB	Deep Creek Rd/SB I-880 OFF Ramp	Fair Ranch Rd	Union City	3	1.42	6	20.2
110	Alvarado Blvd.-NB	Fair Ranch Rd	Union City/Alvarado Blvd	Union City	3	0.52	6	16.2
111	Alvarado Blvd.-SB	Union City/Alvarado Blvd	Fair Ranch Rd	Union City	3	0.52	6	19.1
112	Alvarado Blvd.-SB	Fair Ranch Rd	Deep Creek Rd/SB I-880 OFF Ramp	Union City	3	1.43	6	21.3
113	Alvarado Blvd.-SB	Deep Creek Rd/SB I-880 OFF Ramp	NB I-880 ON Ramp	Union City	3	0.21	6	29.8
114	Fremont Boulevard-NB	NB I-880 OFF Ramp	Automall Parkway	Fremont	3	1.27	6	25.2
115	Fremont Boulevard-NB	Automall Parkway	Blacow Rd	Fremont	3	0.90	6	25.6
116	Fremont Boulevard-NB	Blacow Rd	Adams Ave	Fremont	3	0.38	6	31.2
117	Fremont Boulevard-NB	Adams Ave	Stevenson Rd	Fremont	3	1.17	6	22.5
118	Fremont Boulevard-NB	Stevenson Rd	Mowry Ave	Fremont	3	1.00	6	22.5
119	Fremont Boulevard-NB	Mowry Ave	Peralta Blvd	Fremont	3	1.21	6	22.0
120	Fremont Boulevard-NB	Peralta Blvd	Thornton Ave	Fremont	3	0.32	6	15.6
121	Fremont Boulevard-NB	Thornton Ave	Decoto Rd	Fremont	3	1.34	6	20.2
122	Fremont Boulevard-NB	Decoto Rd	Paseo Padre Pkwy	Fremont	3	0.55	6	30.1
123	Fremont Boulevard-NB	Paseo Padre Pkwy	SB I-880 OFF Ramp	Fremont	3	0.61	6	33.2
124	Fremont Boulevard-SB	SB I-880 OFF Ramp	Paseo Padre Pkwy	Fremont	3	0.40	6	23.6
125	Fremont Boulevard-SB	Paseo Padre Pkwy	Decoto Rd	Fremont	3	0.55	6	17.3
126	Fremont Boulevard-SB	Decoto Rd	Thornton Ave	Fremont	3	1.34	6	21.7
127	Fremont Boulevard-SB	Thornton Ave	Peralta Blvd	Fremont	3	0.32	6	20.9
128	Fremont Boulevard-SB	Peralta Blvd	Mowry Ave	Fremont	3	1.21	6	20.5
129	Fremont Boulevard-SB	Mowry Ave	Stevenson Rd	Fremont	3	1.00	6	34.9
130	Fremont Boulevard-SB	Stevenson Rd	Adams Ave	Fremont	3	0.24	6	29.1
131	Fremont Boulevard-SB	Adams Ave	Blacow Rd	Fremont	3	0.38	6	20.1
132	Fremont Boulevard-SB	Blacow Rd	Automall Parkway	Fremont	3	0.90	6	18.8
133	Fremont Boulevard-SB	Automall Parkway	NB I-880 OFF Ramp	Fremont	3	1.25	6	26.9
134	Automall Parkway-EB	NB I-880 OFF Ramp	Fremont Blvd	Fremont	3	0.85	6	26.8
135	Automall Parkway-EB	Fremont Blvd	NB I-680 ON Ramp	Fremont	3	0.75	6	28.2
136	Automall Parkway-WB	NB I-680 ON Ramp	Fremont Blvd	Fremont	3	0.75	6	27.4
137	Automall Parkway-WB	Fremont Blvd	NB I-880 OFF Ramp	Fremont	3	0.77	6	28.1
139	Vasco Road-NB	WB I-580 OFF Ramp	Scenic Ave	Livermore	4	0.51	6	23.6
140	Vasco Road-NB	Scenic Ave	Dalton Ave/City-County Line	Livermore	4	0.69	6	35.5
141	Vasco Road-NB	Dalton Ave/City-County Line	N. Vasco Rd/Vasco Rd	Livermore	4	1.75	6	43.7
142	Vasco Road-NB	N. Vasco Rd/Vasco Rd	Local Road underpass/County Line	Livermore	4	2.80	6	53.3
143	Vasco Road-SB	Local Road underpass/County Line	N. Vasco Rd/Vasco Rd	Livermore	4	2.80	6	24.3
144	Vasco Road-SB	N. Vasco Rd/Vasco Rd	Dalton Ave/City-County Line	Livermore	4	1.75	6	23.9
145	Vasco Road-SB	Dalton Ave/City-County Line	Scenic Ave	Livermore	4	0.69	6	22.0
146	Vasco Road-SB	Scenic Ave	WB I-580 OFF Ramp	Livermore	4	0.51	6	16.6
147	Dublin Blvd.-EB	San Ramon Road	Village Parkway	Dublin	4	0.73	5	20.8
148	Dublin Blvd.-EB	Village Parkway	Dougherty Rd	Dublin	4	0.81	5	26.4
149	Dublin Blvd.-EB	Dougherty Rd	Hacienda Dr	Dublin	4	1.20	6	31.4
150	Dublin Blvd.-EB	Hacienda Dr	Tassajara Dr	Dublin	4	0.88	6	22.9

Appendix G-8: 2012 LOS Monitoring Study Results for Tier 2 CMP Roadways—a.m. Peak Period

	CMP Tier 2 Route	Segment Limits		Jurisdiction	Plan Area	Length (miles)	2012 LOS Results*	
		From	To				# Runs	Speed
151	Dublin Blvd.-WB	Tassajara Dr	Hacienda Dr	Dublin	4	0.88	6	29.8
152	Dublin Blvd.-WB	Hacienda Dr	Dougherty Rd	Dublin	4		6	
153	Dublin Blvd.-WB	Dougherty Rd	Village Parkway	Dublin	4	1.10	6	23.9
154	Dublin Blvd.-WB	Village Parkway	San Ramon Road	Dublin	4	0.73	6	22.2
155	San Ramon Road-NB	WB I-580 OFF ramp	Silvergate Dr	Dublin	4	0.67	6	18.0
156	San Ramon Road-NB	Silvergate Dr	Alcosta Blvd/Westside Dr/County Line	Dublin	4	0.98	6	28.8
157	San Ramon Road-SB	Alcosta Blvd/Westside Dr/County Line	Silvergate Dr	Dublin	4	0.98	6	33.9
158	San Ramon Road-SB	Silvergate Dr	WB I-580 OFF ramp	Dublin	4	0.67	6	21.4
159	Dougherty Road-NB	WB I-580 OFF ramp	Amador Valley Blvd on SB	Dublin	4	1.15	8	38.5
160	Dougherty Road-NB	Amador Valley Blvd on SB	Fallcreek Rd on SB/County Line	Dublin	4	0.78	8	44.0
161	Dougherty Road-SB	Fallcreek Rd on SB/County Line	Amador Valley Blvd on SB	Dublin	4	0.78	8	28.9
162	Dougherty Road-SB	Amador Valley Blvd on SB	WB I-580 OFF ramp	Dublin	4	1.15	8	21.3
163	Tassajara Road-NB	EB I-580 OFF ramp	Central Parkway	Dublin	4	0.49	7	23.6
164	Tassajara Road-NB	Central Parkway	Somerset Ln/N Dublin Ranch Dr	Dublin	4	0.68	7	23.3
165	Tassajara Road-NB	Somerset Ln/N Dublin Ranch Dr	Fallon Rd	Dublin	4	1.05	7	35.1
166	Tassajara Road-NB	Fallon Rd	County Line	Alameda County	4	0.50	7	39.8
167	Tassajara Road-SB	County Line	Fallon Rd	Alameda County	4	0.50	9	40.5
168	Tassajara Road-SB	Fallon Rd	Somerset Ln/N Dublin Ranch Dr	Dublin	4	1.05	9	35.4
169	Tassajara Road-SB	Somerset Ln/N Dublin Ranch Dr	Central Parkway	Dublin	4	0.68	9	22.4
170	Tassajara Road-SB	Central Parkway	WB I-580 OFF ramp	Dublin	4	0.46	9	16.7
171	E. Stanley Blvd - Railroad Avenue - 1st	SR 84/Isabel Ave	Murrita Blvd	Pleasanton,	4	0.98	8	20.4
172	E. Stanley Blvd - Railroad Avenue - 1st	Murrita Blvd	S Livermore Ave	Livermore	4	1.07	8	21.9
173	E. Stanley Blvd - Railroad Avenue - 1st	S Livermore Ave	Inman St	Livermore	4	0.46	8	14.2
174	E. Stanley Blvd - Railroad Avenue - 1st	Inman St	S Livermore Ave	Livermore	4	0.46	6	20.1
175	E. Stanley Blvd - Railroad Avenue - 1st	S Livermore Ave	Murrita Blvd	Livermore	4	1.07	6	20.1
176	E. Stanley Blvd - Railroad Avenue - 1st	Murrita Blvd	SR 84/Isabel Ave	Pleasanton,	4	0.98	6	38.6
177	Stoneridge Drive-EB	NB I-680 OFF Ramp	Hopyard Rd	Pleasanton	4	0.93	7	19.7
178	Stoneridge Drive-EB	Hopyard Rd	Hacienda Dr	Pleasanton	4	0.49	7	22.4
179	Stoneridge Drive-EB	Hacienda Dr	W. Las Positas Blvd	Pleasanton	4	0.64	7	25.3
180	Stoneridge Drive-EB	W. Las Positas Blvd	Santa Rita Road	Pleasanton	4	0.43	7	14.6
181	Stoneridge Drive-EB	Stoneridge Dr/Santa Rita Road	W. Los Positas Blvd	Pleasanton	4	0.29	7	15.6
182	Stoneridge Drive-EB	W. Los Positas Blvd	WB I-580 OFF Ramp	Pleasanton	4	0.88	7	34.5
183	Stoneridge Drive-WB	WB I-580 OFF Ramp	W. Los Positas Blvd	Pleasanton	4	0.92	6	25.5
184	Stoneridge Drive-WB	W. Los Positas Blvd	Santa Rita Road	Pleasanton	4	0.29	6	27.6
185	Stoneridge Drive-WB	Santa Rita Road	W. Las Positas Blvd	Pleasanton	4	0.43	6	25.5
186	Stoneridge Drive-WB	W. Las Positas Blvd	Hacienda Dr	Pleasanton	4	0.64	6	28.5
187	Stoneridge Drive-WB	Hacienda Dr	Hopyard Rd	Pleasanton	4	0.49	6	20.1
188	Stoneridge Drive-WB	Hopyard Rd	NB I-680 OFF Ramp	Pleasanton	4	0.66	6	21.9
189	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	NB I-680 OFF	Bernal Ave	Pleasanton	4	1.22	8	28.8
190	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave	Ray/Vineyard	Pleasanton	4	0.64	8	19.5
191	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Ray/Vineyard	Bernal Ave/Valley Ave	Pleasanton	4	0.84	8	26.1
192	Sunol Blvd.- 1st Street- Stanley Blvd.-NB	Bernal Ave/Valley Ave	SR 84/Isabel Ave	Pleasanton,	4	2.91	8	46.7
193	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	SR 84/Isabel Ave	Bernal Ave/Valley Ave	Pleasanton,	4	2.91	6	38.3
194	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave/Valley Ave	Ray/Vineyard	Pleasanton	4	0.85	6	31.1
195	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Ray/Vineyard	Bernal Ave	Pleasanton	4	0.63	6	11.8
196	Sunol Blvd.- 1st Street- Stanley Blvd.-SB	Bernal Ave	NB I-680 OFF	Pleasanton	4	1.23	6	26.2

* Upon completion of Free Flow Speed Survey in Fall 2012, classification of the Tier 2 roadways will be determined and the service levels (LOS letters) based on the classifciation and 2012 speed will be reported.

Highlighted areas indicate segments with speed data based on less than the regular six base runs

Appendix G-9

Appendix G-9: 2012 LOS Monitoring Study Results for Freeways—Weekend Peak Period									
		Segment Limits			Plan	Length	No of	2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	Speed	LOS
1	I-80 - EB	SF County Line	Toll Plaza	Oak	1	2.06	10	56.8	B
2	I-80 - EB	Toll Plaza	I-580 SB Merge	Oak	1	1.15	10	48.0	D
3	I-80 - EB	I-80/I-580 (Merge)	Powell	Emery - Berk	1	0.79	10	23.1	**F(30)**
4	I-80 - EB	Powell	Ashby	Emery - Berk	1	0.67	10	16.9	**F(20)**
5	I-80 - EB	Ashby	University	Emery - Berk	1	1.34	10	39.8	E
6	I-80 - EB	University	Jct I-580 (off)	Berk - Alb	1	1.51	10	59.6	B
7	I-80 - EB	Jct I-580 (off)	Central (on)	Berk - Alb	1	1.12	10	61.4	A
8	I-80 - WB	Central	Jct I-580	Berk - Alb	1	0.70	10	27.5	**F(30)**
9	I-80 - WB	Jct I-580	Univerity	Berk - Alb	1	1.49	10	25.5	**F(30)**
10	I-80 - WB	University	Ashby	Emery - Berk	1	1.36	10	36.5	E
11	I-80 - WB	Ashby	Powell	Emery - Berk	1	0.64	10	39.1	E
12	I-80 - WB	Powell	I-80/I-580 (Split)	Emery - Berk	1	0.42	10	35.9	E
13	I-80 - WB	I-580 Split	Toll Plaza	Oak	1	1.20	10	13.5	**F(20)**
14	I-80 - WB	Toll Plaza	SF County	Oak	1	2.00	10	18.1	**F(20)**
15	I-238 - EB	I-880	I-580	Uninc-San L	2	2.28	6	64.8	A
16	I-238 - WB	I-580	I-880	Uninc-San L	2	1.60	6	35.8	E
17	I-580 - EB	I-580/I-238	Grove	Unincorp	2	2.88	8	59.1	B
18	I-580 EB	Grove	Eden Canyon	Uninc - Pleas	4	2.17	8	80.0	A
19	I-580 EB	Eden Canyon	San Ramon/ Foothill	Uninc - Pleas	4	4.80	8	70.6	A
20	I-580 EB	San Ramon/ Foothill	I-680	Uninc - Pleas	4	0.77	8	71.4	A
21	I-580 EB	I-680	Hopyard	Plea	4	0.76	8	67.6	A
22	I-580 EB	Hopyard	Santa Rita	Plea	4	1.96	8	71.9	A
23	I-580 EB	Santa Rita	El Charro	Uninc-Pleas	4	1.24	8	71.0	A
24	I-580 EB	El Charro	SR 84/Airway Blvd.	Unincorp	4	1.52	8	69.3	A
25	I-580 EB	SR 84/Airway Blvd.	Portola	Unincorp	4	1.71	8	71.2	A
26	I-580 - EB	Portola	1st St	Liv	4	2.70	8	70.4	A
27	I-580 - EB	1st St	Greenville	Liv-Uninc	4	1.98	8	60.5	A
28	I-580 - EB	Greenville	N.Flynn	Uninc	4	1.50	8	46.0	D
29	I-580 - EB	N.Flynn	Grant Line	Uninc	4	3.19	8	53.3	C
30	I-580 - EB	Grant Line	I-205 (SJ Co) Off	Uninc	4	1.11	8	48.4	D
31	I-580 - WB	I-205 (SJ Co)	Grant Line	Liv - Uninc	4	0.89	8	40.4	E
32	I-580 - WB	Grant Line	N Flynn	Liv - Uninc	4	4.56	8	72.3	A
33	I-580 - WB	N Flynn	Greenville Rd	Liv - Uninc	4	2.34	8	73.0	A
34	I-580 - WB	Greenville Rd	1st St	Liv - Uninc	4	2.30	8	70.5	A

Appendix G-9: 2012 LOS Monitoring Study Results for Freeways—Weekend Peak Period

		Segment Limits			Plan	Length	No of	2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	Speed	LOS
35	I-580 - WB	1st St	Portola Ave	Liv	4	2.52	8	68.3	A
36	I-580 - WB	Portola	SR 84/Airway Blvd	Liv - Plea	4	1.76	8	69.2	A
37	I-580 - WB	SR 84/Airway Blvd	Fallon Rd/El Charro	Plea	4	1.78	8	60.9	A
38	I-580 - WB	Fallon Rd/El Charro	Tassajara	Plea	4	1.16	8	57.7	B
39	I-580 - WB	Tassajara Rd	I-680	Plea	4	2.87	8	54.2	C
40	I-580 - WB	I-680	San Ramon Rd	Plea - Uninc	4	0.69	8	68.4	A
41	I-580 - WB	San Ramon Rd	Eden Caynon	Plea - Uninc	4	4.75	8	69.8	A
42	I-580 - WB	Eden Canyon	Center St	Plea - Uninc	4	2.28	8	74.6	A
43	I-580 - WB	Center	I-580/238	Unincorp	2	1.94	8	64.8	A
44	I-580 - EB	I-80	I-980	Oak	1	1.24	8	49.8	C
45	I-580 - EB	I-980	Harrison	Oak	1	0.95	8	92.9	A
46	I-580 - EB	Harrison	Lakeshore	Oak	1	0.69	8	62.4	A
47	I-580 - EB	Lakeshore	Coolidge	Oak	1	2.25	8	66.7	A
48	I-580 - EB	Coolidge	SH 13 Off	Oak	1	2.15	8	67.9	A
49	I-580 - EB	SH 13 Off	MacArthur	Foothill	1	4.09	8	64.1	A
50	I-580 - EB	MacArthur	I-580/238	SL - Hay	2	4.33	8	68.4	A
51	I-580 - WB	I-238	Foothill/MacArthur	Oak -SL	2	4.42	8	75.3	A
52	I-580 - WB	Foothill/MacArthur	SH 13 Off	Oak -SL	1	3.89	8	67.6	A
53	I-580 - WB	SH 13 Off	Fruitvale	Oak	1	2.36	8	61.6	A
54	I-580 - WB	Fruitvale	Harrison	Oak	1	2.21	8	47.1	D
55	I-580 - WB	Harrison	SH 24 On-ramp	Oak	1	1.16	8	21.1	**F(30)**
56	I-580 - WB	SH-24 On-ramp	I-80/580 Split	Oak	1	0.69	8	13.2	**F(20)**
57	I-580 - EB	Central	I-80 Jct	Alb	1	0.77	4	23.2	**F(30)**
58	I-580 - WB	I-80 Jct	Central	Alb	1	1.07	4	69.8	A
59	I-680 - NB	Scott Creek Rd	Rt 262/Mission	Fre	3	2.20	6	68.5	A
60	I-680 - NB	Rt 262/Mission	Durham Rd	Fre	3	1.34	6	52.2	C
61	I-680 - NB	Durham Rd	Washington Blvd	Fre	3	1.54	6	53.5	C
62	I-680 - NB	Washington Blvd	Rt 238/Mission	Fre	3	0.89	6	58.1	B
63	I-680 NB	SR 238/Mission	Vargas Rd	Unincorp	3	0.82	6	61.9	A
64	I-680 NB	Vargas Rd	Andrade Rd	Unincorp	3	2.64	6	65.8	A
65	I-680 NB	Andrade Rd	Calaveras	Unincorp	3	1.13	6	63.6	A
66	I-680 NB	Calaveras	Rt.84/Vallecitos	Unincorp	3	0.30	6	73.8	A
67	I-680 NB	SR 84	Sunol Blvd	Plea - Uninc	4	3.45	6	69.2	A
68	I-680 NB	Sunol Blvd.	Bernal Ave	Plea - Uninc	4	1.52	6	65.0	A
69	I-680 NB	Bernal Ave	Stoneridge Dr	Plea	4	2.39	6	64.3	A
70	I-680 NB	Stoneridge Dr	I-580	Plea	4	0.84	6	70.1	A
71	I-680 - NB	I-580	Alcosta	Dub	4	1.83	6	65.0	A

Appendix G-9: 2012 LOS Monitoring Study Results for Freeways—Weekend Peak Period

		Segment Limits			Plan	Length	No of	2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	Speed	LOS
72	I-680 - SB	Alcosta	I-580	Dub	4	1.84	6	69.5	A
73	I-680 SB	I-580	Stoneridge Dr	Plea	4	0.76	6	61.3	A
74	I-680 SB	Stoneridge Dr	Bernal	Plea	4	2.55	6	67.0	A
75	I-680 SB	Bernal Ave.	Sunol Blvd	Unincorp	4	1.31	6	59.7	B
76	I-680 SB	Sunol Blvd.	SR 84	Unincorp	4	3.82	6	68.5	A
77	I-680 SB	SR 84 (Niles Canyon)	Andrade Rd	Unincorp	3	1.32	6	65.4	A
78	I-680 SB	Andrade Rd	Sheridon Rd	Unincorp	3	1.39	6	63.1	A
79	I-680 SB	Sheridon Rd	Vargas Rd	Unincorp	3	0.81	6	66.8	A
80	I-680 SB	Vargas Rd	SR 238/Mission	Unincorp	3	1.08	6	65.3	A
81	I-680 - SB	Rt 238/Mission	Washington Blvd	Fre	3	1.04	6	65.3	A
82	I-680 - SB	Washington Blvd	Durham Rd	Fre	3	1.52	6	69.0	A
83	I-680 - SB	Durham Rd	Rt 2262/Mission	Fre	3	1.67	6	72.1	A
84	I-680 - SB	Rt 262/Mission	Scott Creek Rd	Fre	3	2.19	6	65.2	A
85	I-880 - NB	Dix Landing	SR 262/Mission	Fre	3	2.08	8	75.2	A
86	I-880 - NB	SR262/Mission	AutoMall Pkwy	Fre	3	2.44	8	68.8	A
87	I-880 - NB	AutoMall Pkwy	Stevenson	Fre	3	1.54	8	67.8	A
88	I-880 - NB	Stevenson	Decoto	Fre	3	4.04	8	67.6	A
89	I-880 - NB	Decota	Alvarado Blvd	Fre - Un Cty	3	1.17	8	60.7	A
90	I-880 - NB	Alcarado Blvd	Alvarado-Niles Blvd	Fre- Uni Cty	3	1.17	8	54.9	C
91	I-880 - NB	Alv-Niles	Tennyson	Un Cty - Hay	3	2.65	8	65.0	A
92	I-880 - NB	Tennyson	SR 92	Hay	2	1.14	8	72.2	A
93	I-880 - NB	SR 92	A St	Hay	2	1.52	8	56.4	B
94	I-880 - NB	A St	I-238	Unincorp	2	1.82	8	65.4	A
95	I-880 - NB	I-880/I238 (split)	Marina Blvd	Oak -SL	2	2.66	8	68.6	A
96	I-880 - NB	Marina Blvd	SR 112/Davis	Oak - SL	2	0.79	8	65.9	A
97	I-880 - NB	SR 112/Davis	Hegenberger	Oak - SL	2	1.88	8	68.7	A
98	I-880 - NB	Hegenberger	High/42nd	Oak	1	2.47	8	65.1	A
99	I-880 - NB	High/42nd	23rd (1st on)	Oak	1	1.06	8	61.4	A
100	I-880 - NB	23RD (1ST on)	Jct 980 (off)	Oak	1	2.64	8	64.8	A
101	I-880 - NB	Jct 980 (off)	I-880/I-80 split	Oak	1	2.38	8	62.9	A
103	I-880 - SB	I-880/I-80 split	I-880/I-80 merge	Oak	1	1.63	8	61.6	A
104	I-880 - SB	I-880/I-80 merge	Jct 980	Oak	1	2.65	8	82.7	A
105	I-880 - SB	I-980	23rd	Oak	1	2.79	8	58.6	B
106	I-880 - SB	23rd St	High/42nd	Oak	1	1.35	8	73.5	A
107	I-880 - SB	High/42nd	Hegenberger	Oak	1	2.27	8	61.3	A
108	I-880 - SB	Hegenberger	SR 112/Davis	Oak - SL	1	1.69	8	58.4	B
109	I-880 - SB	SR 112/Davis	Marina Blvd	Oak - SL	1	0.87	8	68.8	A

Appendix G-9: 2012 LOS Monitoring Study Results for Freeways—Weekend Peak Period

		Segment Limits			Plan	Length	No of	2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	Speed	LOS
110	I-880 - SB	Marina Blvd	SR 238 WB (merge)	Oak - SL	1	2.41	8	66.0	A
111	I-880 - SB	I-238	A St	SL-Uninc	2	2.03	8	65.7	A
112	I-880 - SB	A St	Rt 92	Hay	2	1.81	8	63.3	A
113	I-880 - SB	Rt 92	Tennyson	Hay	2	0.96	8	61.0	A
114	I-880 - SB	Tennyson	Alv-Niles	Hay - UC	2	2.49	8	63.1	A
115	I-880 - SB	Alvarado-Niles	Alvarado	UC - Fre	2	1.37	8	62.3	A
116	I-880 - SB	Alvarado	Decoto	UC - Fre	2	1.17	8	61.8	A
117	I-880 - SB	Decoto	Stevenson	Fre	3	4.07	8	66.4	A
118	I-880 - SB	Stevenson	AutoMall Pkwy	Fre	2	1.26	8	62.4	A
119	I-880 - SB	AutoMall Pkwy	Rt 262/Mission	Fre	2	3.04	8	63.3	A
120	I-880 - SB	SR 262/Mission	Dix Landing(off)	Fre	3	1.27	8	69.8	A
121	I-980 - WB	SR 24 @ 580	I-880	Oak	1	2.27	8	66.0	A
122	I-980 - EB	I-880	SR 24 @ 580	Oak	1	2.32	8	62.8	A
123	SR 13 - NB	Mountain On	Carson/Redwood (1) (off)	Oak	1	1.20	4	91.3	A
124	SR 13 - NB	Carson/Redwood (1) (off)	Joaguin Miller	Oak	1	1.09	4	44.4	D
125	SR 13 - NB	Joa Miller/Linc	Moraga Ave	Oak	1	1.77	4	56.3	B
126	SR 13 - NB	Moraga Ave	Hiller (Sig)	Oak	1	1.57	4	30.1	E
127	SR 13 - SB	Hiller Sig	Moraga Ave	Oak	1	1.66	4	60.6	A
128	SR 13 - SB	Moraga Ave	Joa Miller/Linc	Oak	1	2.04	4	74.2	A
129	SR 13 - SB	Joaq Miller/Lincoln	Redwood	Oak	1	1.34	4	64.0	A
130	SR 13 - SB	Redwood	Jct I-580 (EB Merge)	Oak	1	0.89	4	57.2	B
131	SR 24 - EB	Jct I-580 (on)	Broadway/SR 13	Oak	1	2.08	8	42.9	D
132	SR 24 - EB	Broadway/SR 13	Caldecott (enter)	Oak	1	1.41	8	43.0	D
133	SR 24 - EB	Caldecott (enter)	Fish Ranch Road	Oak	1	1.03	8	47.6	D
134	SR 24 - WB	Fisch Ranch Road (CC)	Caldecott (exit)	Oak	1	0.99	8	43.1	D
135	SR 24 - WB	Caldecott (exit)	Broadway	Oak	1	1.77	8	71.0	A
136	SR 24 - WB	Broadway	Jct I-580 (on)	Oak	1	2.19	8	58.7	B
137	SR 84 - EB	San M CL	Toll Plaza	Fremont	3	2.97	6	54.8	C
138	SR 84 - EB	Toll Plaza	Thornton	Fremont	3	0.27	6	60.1	A
139	SR 84 - EB	Thornton Ave/Pascon Padre	Newark Blvd/Ardenwood Blvd	Newark	3	1.23	6	69.7	A
140	SR 84 - EB	Newark Blvd/Ardenwood Blvd	I-880 NB (off)	Newark	3	0.97	6	44.6	D
141	SR 84 - WB	I-880 NB (off)	Ardenwood/Newark		3	0.99	6	44.5	D
142	SR 84 - WB	Ardenwood/Newark	Paseo Padre Pkwy		3	1.15	6	65.4	A
143	SR 84 - WB	Paseo Padre Pkwy	Toll Gate		3	0.75	6	46.6	D
144	SR 84 - WB	Toll Plaza	San M CL	Fremont	2	3.17	6	65.1	A
145	SR 92 - EB	San M CL	Toll Plaza	Uninc - Hay	2	2.61	6	65.1	A
146	SR 92 - EB	Toll Plaza	Clawiter	Uninc - Hay	2	1.76	6	62.3	A

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		Segment Limits			Plan	Length	No of	2012 LOS Results	
	CMP Route	From	To	Jurisdiction	Area	(miles)	Lanes	Speed	LOS
147	SR 92 - EB	Clawiter	I-880	Hay	2	2.10	6	67.4	A
148	SR 92 - WB	I-880	Clawiter	Hay	2	2.01	6	58.9	B
149	SR 92 - WB	Clawiter	Toll Plaza	Uninc - Hay	2	1.87	6	49.0	C
150	SR 92 - WB	Toll Plaza	San M CL	Uninc - Hay	2	2.61	6	62.3	A