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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