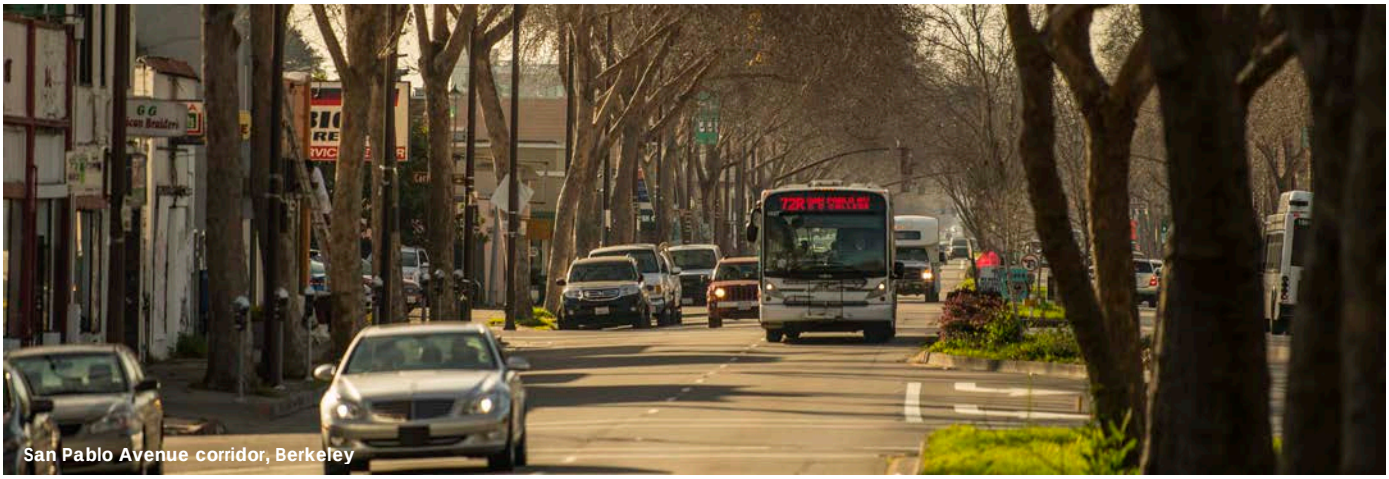
# Level of Service and Transit Performance Standards

# 3



San Pablo Avenue corridor, Berkeley

State law requires that level of service (LOS) standards be established to monitor the CMP roadway network's LOS as part of the CMP process[10]. The legislation leaves the choice of LOS measurement methodology to the CMAs, but mandates that the LOS be measured by the most recent version of the Transportation Research Board's Highway Capacity Manual (HCM) or a uniform methodology adopted by the CMA, Alameda CTC for Alameda County, that is consistent with the HCM (see Appendix B for Alameda CTC's assessment of HCM2010).

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 fastest operating conditions and LOS F representing the slowest (see Appendix E for graphic representation of LOS).

The purpose of setting LOS standards for the CMP network is to provide a quantitative tool to analyze the effects of land use changes on the transportation network's performance (i.e., congestion) or to identify hot spots. If the actual network performance of a roadway segment falls below the standard (i.e., congestion worsens below LOS E), actions must be taken to improve the LOS.

Alameda CTC contracts with a consultant to perform the necessary LOS monitoring for the CMP network. Initially, the CMP network was monitored annually, but in 1998 a policy was adopted to perform the LOS monitoring every two years, which has proven to be the most cost-effective approach. The next monitoring study will be performed in spring 2020.

In addition to monitoring auto LOS on the CMP roadways, Alameda CTC has expanded its biennial performance monitoring to include multimodal performance standards. This is an outcome of the agency's development of comprehensive countywide modal plans, including a Countywide Goods Movement Plan, a Countywide Multimodal Arterial Corridor Plan, and a Countywide Transit Plan to identify and address the multimodal transportation needs of the county as a whole. As a first step, Alameda CTC began transit performance monitoring on the network described in Chapter 2 in the 2018 monitoring cycle.

[10] California Government Code Section 65089(b)(1)(A).

# Standards and Approach for LOS Monitoring

LOS is an indication of traffic growth trends using vehicular volumes, capacity, and measurement of average speed and delay. The goal is to develop a consistent approach for monitoring LOS that is easy to use, non-duplicative, and compatible with local government data and travel-demand models. Table 3.1 describes the approach for monitoring LOS in Alameda County and defines the facility classifications.

### Table 3.1—Approach to LOS Monitoring

| Element | Approach |
|---|---|
| **Level of Service** | As defined in the California Government Code Section 65089.3, the LOS standard is E, except where F was the LOS when originally measured, in which case the standard is F. The methods employed by Alameda CTC constitute a uniform methodology adopted by the Commission that is consistent with the HCM1985 that includes speed-based LOS methodology for roadway segments. Methods described in HCM Chapter 8, "Two-Lane Highways" and Chapter 11, "Urban and Suburban Arterials" were the basis for establishing the LOS on the CMP network. LOS is assessed based on the average speed observed along a roadway segment (link speeds) or total volumes approaching an intersection (link volumes). These methods are not designed to replace the more detailed procedures that local agencies are likely to use for non-CMP purposes (such as local impact studies). Such procedures typically focus on an intersection's ability to handle individual turning movements rather than average speed on a roadway segment. Pending the final rulemaking of the Office of Planning and Research's CEQA Guidelines on Evaluating Transportation Impacts in CEQA to implement SB 743, local impact studies would shift from measuring intersection or segment-level LOS impacts to vehicle miles traveled impacts. |
| **Facility Classifications** | The HCM provides methods for determining LOS on several types of facilities. These facilities are grouped into "interrupted-flow" and "uninterrupted-flow" facilities. Interrupted-flow facilities include city streets and surface highways (for example, State Route 123/San Pablo Avenue) that are part of the state highway system. Freeways are uninterrupted-flow facilities. For the purposes of LOS monitoring, the CMP network can be classified into three functional types of facilities: 1) freeways; 2) two-lane roadways; and 3) urban/suburban arterials. In Alameda County, HCM1985 classification is used for the Tier 1 roadways for consistency in methodology and for the ability to track performance trends over time. HCM2000 is followed for Tier 2 roads added since 2011. |

| Element | Approach |
|---|---|
| 1) Freeways | Freeways are uninterrupted-flow facilities, since traffic never stops (except during the most congested periods or when incidents occur). The 1991 Alameda County CMP, in coordination with local jurisdictions, defined appropriate segments and performed the necessary "floating car" runs on the freeways to obtain travel speed data (refer to "Data Collection and Requirements" in this chapter for information on this data collection method). This allowed the establishment of a baseline LOS for the roadway network, including identification of segments operating at LOS F. |
| 2) Two-Lane Roadways | Two-lane roadways are uninterrupted-flow facilities, also referred to as principal arterials. The criteria adopted by Alameda CTC for including principal arterials in the CMP network specify a minimum of four lanes; therefore, two-lane roadways are not included as principal arterials. However, since all state highways must be in the system, two-lane state highways located in the county are also included in the CMP network. These two-lane roads constitute a fairly small portion of the CMP network mileage. For two-lane roads without interruptions (signals or stop signs), the methodology in HCM Chapter 8 is used, based on average travel speed. |
| 3) Urban and Suburban Arterials | Urban and suburban arterials are multilane streets that have traffic signals spaced no more than two miles apart on average. Urban and suburban arterials are characterized by platoon flows. Operational quality is controlled primarily by the efficiency of signal coordination and is affected by how individual signalized intersections operate along the arterial. LOS is primarily a function of travel speed along segments and is calculated from field data. Because the CMP legislation emphasizes systems-level planning, HCM Chapter 11 is used to estimate arterial LOS. Advantages include the need for relatively little input data, simple applied calculations, and the results of explicitly determined LOS (A, B, C, etc.). |
| **Monitoring** | Alameda CTC monitors LOS and produces comprehensive a biennial report. Alameda CTC uses two data collection methods for LOS monitoring: 1) commercial speed data based on aggregated traffic data from GPS-enabled vehicles and mobile devices, traditional road sensors, and other sources; and 2) the floating car technique of recording travel times between checkpoints based on actual travel time during the peak period. Refer to "Data Collection and Requirements" in this chapter for details on the two data collection methods. |
| **Interregional Trips** | For the purposes of conformity with current legislation, interregional travel is defined as "any trip that originates from outside" Alameda County. A trip means a one-direction vehicle movement. The origin of any trip is the starting point of that trip. In accordance with the Metropolitan Transportation Commission (MTC) guidelines, trips with no trip end in Alameda County (through trips) are not subtracted for monitoring reports. |

## Highway Capacity Manual (HCM) and LOS Standards

The Congestion Management Program legislation requires that the LOS monitoring on CMP roadways be measured by the most recent version of the HCM or by a uniform methodology adopted by the CMA, consistent with the HCM. For LOS Monitoring and Deficiency Plan purposes, Alameda CTC uses speed-based LOS methods included in the HCM1985 to

determine LOS for the CMP roadways, as shown in Table 3.2 (adopted in 1991 and updated in 2004).

To transition to using the most recent HCM for the purposes of LOS monitoring and Land Use Analysis Programs of the CMP, efforts were made in 2005 to use HCM2000 and in 2013 to use HCM2000 or HCM2010. Based on comparative analyses of the various HCMs, the following observations were made:

- **Different methodologies would hinder conformity.** For freeways, the differences between the HCM1985 and the HCM2000 and HCM2010 methodologies were significant. Specifically, the basis for determining LOS has changed from speed-based LOS in HCM1985 to density-based LOS in HCM2000 and HCM2010. This eliminates the ability to track previous LOS trends, monitoring of existing deficiency plans, and consistency in determining deficiency; hence, this affects conformity.
- **Classification changes would affect conformity.** For arterials, the roadway classifications changed after the HCM1985. Classifications were added in the HCM2000, and later classifications were eliminated in the HCM2010. Further, in the HCM2010, free-flow speed, which is the basis for estimating LOS in all HCM versions, requires additional facility-specific data that is excessive for large-scale use such as LOS monitoring on the countywide CMP network.

Using the later HCM2000 and HCM2010 versions would result in applying density-based LOS methodology for freeways and changed classifications for arterials. This would not provide substantially improved performance data and would hinder conformity and the ability to compare past performance trends. Based on this analysis for the Tier 1 network, which is subject to conformity, Alameda CTC will continue to use speed-based LOS methodology and arterial classifications in the HCM1985 to monitor freeways and arterials. For the Tier 2 network, which has been only monitored for informational purposes since 2012 and has no previous performance data available to compare, LOS was reported using both HCM1985 and HCM2000 methodologies starting in 2014. Accordingly, the 2014 LOS Monitoring Report developed different classifications for Tier 2 based on HCM1985 and HCM2000 and the reported LOS. Since the classification has already been established, the 2020 LOS monitoring cycle will continue to use the same approach.

As part of the 2013 CMP update, Alameda CTC identified LOS standards to monitor alternative modes in a comparable way to auto performance. Since HCM2010 also included LOS standards for monitoring alternative modes, such as multimodal level of service (MMLOS), Alameda CTC evaluated MMLOS for monitoring performance of transit and bicycle and pedestrian modes. It was found that using the HCM2010-based MMLOS is data and resource intensive and costly for large-scale applications such as monitoring countywide performance of the alternative modes; therefore, it is not suitable for LOS monitoring purposes. In-lieu of MMLOS, Alameda CTC began measuring transit performance in the 2018 LOS monitoring cycle. The 2017 CMP Update, described in Chapter 2, identified major transit corridors across the county for monitoring transit performance. Alameda CTC will continue to review the methodology during each CMP update to identify any improvements to the overall approach.

## Table 3.2—Relationship Between Average Travel Speed and LOS

| Freeways (Source: HCM1985) | | | |
|---|---|---|---|
| **Level of Service** | **Average Travel Speed (mph)** | **Volume-To-Capacity Ratio** | **Maximum Traffic Volume (vehicles/hour/lane)** |
| **A** | ≥ 60 | 0.35 | 700 |
| **B** | ≥ 55 | 0.58 | 1000 |
| **C** | ≥ 49 | 0.75 | 1500 |
| **D** | ≥ 41 | 0.90 | 1800 |
| **E** | ≥ 30 | 1.00 | 2000 |
| **F** | ≤ 30 | Variable | – |

| Arterials LOS (Source: HCM1985) (used for monitoring freeways and arterials) | | | |
|---|---|---|---|
| **Arterial Class** | **I** | **II** | **III** |
| **Range of Free Flow Speed (mph)** | 35 to 45 | 30 to 35 | 25 to 35 |
| **Typical Free Flow Speed (mph)** | 40 | 33 | 27 |
| **Level of Service** | **Average Travel Speed (mph)** | | |
| **A** | ≥ 35 | ≥ 30 | ≥ 25 |
| **B** | ≥ 28 | ≥ 24 | ≥ 19 |
| **C** | ≥ 22 | ≥ 18 | ≥ 13 |
| **D** | ≥ 17 | ≥ 14 | ≥ 9 |
| **E** | ≥ 13 | ≥ 10 | ≥ 7 |
| **F** | ≤ 13 | ≤ 10 | ≤ 7 |

| Arterials LOS (Source: HCM1985 and HCM2000) (used for monitoring Tier 2 arterials) | | | | |
|---|---|---|---|---|
| **Urban Street Class** | **I** | **II** | **III** | **IV** |
| **Range of Free Flow Speed (mph)** | 55 to 45 | 45 to 35 | 35 to 30 | 35 to 25 |
| **Typical Free Flow Speed (mph)** | 50 | 40 | 35 | 30 |
| **Level of Service** | **Average Travel Speed (mph)** | | | |
| **A** | > 42 | > 35 | > 30 | > 25 |
| **B** | > 34-42 | > 28-35 | > 24-30 | > 19-25 |
| **C** | > 27-34 | > 22-28 | > 18-24 | > 13-19 |
| **D** | > 21-27 | > 17-22 | > 14-18 | > 9-13 |
| **E** | > 16-21 | > 13-17 | > 10-14 | > 7-9 |
| **F** | ≤ 16 | ≤ 13 | ≤ 10 | ≤ 7 |

Sources: Table 12-1, Special Report 209, HCM 1985; Exhibit 15-2, HCM 2000 (U.S. Customary Units). Information in [brackets] added for clarification.

# Traffic Monitoring Program

Alameda CTC conducts LOS monitoring on the Alameda County CMP network. For this purpose, the CMP route segments were determined for travel-time analysis with input from the Alameda County Technical Advisory Committee (ACTAC) and appropriate local jurisdiction departments (traffic engineering, planning department, etc.). Data collection time periods were determined based on the general congested peak periods on most of the CMP roadway network.

## Definition of Roadway Segments

Alameda CTC used the following guidelines to determine the segments:

- Segments should be at least one mile and not more than five miles in length; and
- Logical segment break-points include jurisdictional boundaries, points where the basic number of travel lanes change, locations where land use changes occur (e.g., commercial areas versus residential), and points where the posted speed limit changes or where the number of adjacent driveways is significantly different.

Since the adoption of the CMP roadway segments in 1991, the intensity and location of congestion throughout the county has changed. In 2007, the CMP roadway segment lengths and criteria for designating the CMP roadway segments to develop new segments were updated to better reflect existing land use and travel patterns.

Many long segments were found to be operating at better levels of service because speeds were averaged over the length of longer segments. Splitting these segments using the approved criteria revealed congestion hot spots and more accurately identified congested segments. Because the original checkpoints were retained, all new segments nest within the pre-2007 roadway segments. This approach allows trends to be evaluated over time. During the 2009 CMP Update, SR-84 in East County was segmented into shorter segments based on the same criteria. Similarly, as part of the 2017 CMP update, two segments on A Street and Mission Boulevard in Hayward were segmented into shorter segments, to reflect the one-way traffic pattern that resulted from opening the Hayward Loop. From a field and operating perspective, the current CMP roadway segmentation criteria are still appropriate; therefore, no changes are recommended for this update.

## Data Collection and Requirements

The traffic monitoring program requires information about average travel speed, which is the basis for measuring level of service on all facility types (i.e., freeways, two-lane highways, and urban/suburban arterials). For a given roadway segment, speed data must be collected and reported separately for each travel direction. Travel speed studies for this purpose are conducted using two methods for autos—commercial speed data and floating car survey:

- Commercial speed data aggregates traffic data from GPS-enabled vehicles and mobile devices, traditional road sensors, and other sources. These data are reported using discrete roadway links known as Traffic Message Channels (TMCs). For the 2018 LOS monitoring, data at one-minute intervals was accessed for the selected monitoring times across all the identified TMCs in Alameda County. Use of commercial speed data was approved by the Commission in 2013 based on a validation exercise carried out by Alameda CTC.
- Floating car surveys are used where the coverage of commercial speed data is not adequate or results are not expected to be reliable. Floating car surveys use GPS technology to determine the travel time between the start and end of each CMP segment. A test car is driven six times in each direction on each CMP segment. If congested segments (LOS F) are experienced in the afternoon, and the route is subject to conformity, then two additional runs are generally completed on the entire route. Floating car surveys are conducted for Tier 1 arterials and for 18 miles out of 89 miles of

Tier 2 arterials. In the 2016 LOS Monitoring Report, two new metrics were added—reliability and duration of delay, both of which were calculated for informational purposes.

The data collection process also identifies the days and time periods to perform CMP network monitoring. For the most recent LOS monitoring cycle, monitoring days were reviewed and identified separately for commercial speed data and floating car surveys:

- Commercial speed data collection and floating car surveys are generally conducted in the months of March, April, and May when schools are in session. When additional floating car surveys are required, some data collection efforts can be extended into the first week of June, but need to be complete before the schools close for the summer.
- Data are collected on a Tuesday, Wednesday, and/or Thursday, because these days are most indicative of average weekday conditions. Additional weekend monitoring of freeways (Tier 1) was done for informational purposes, between 1:00 p.m. and 3:00 p.m.
- Monitoring time periods are 4:00 p.m. to 6:00 p.m. during the p.m. peak hours and 7:00 a.m. to 9:00 a.m. during the a.m. peak hours. Generally, p.m. peak-period monitoring is used for conformity purposes, with the exception of the Tier 2 network, where both morning and afternoon peak periods are monitored for informational purposes only. Monitoring during the a.m. peak period for all CMP roadways is for informational purposes only.
- Test car runs on a particular segment must span a range of days and time of day. This means that test car runs should not be bunched on the same day of the week or taken on separate days at the same time.
- Data collection during holidays, special events, when school is not in session, or when roadway construction is under way must be avoided.
- Consistent monitoring periods must be observed for each roadway segment. For example, a comparison between April 2010 and April 2011 is likely to be more valid than a comparison between January 2010 and August 2011.
- If special generators are located within a few miles of the monitoring location, it must be determined whether unusual or unwanted activity levels are occurring at the special generators.
- Incidents are generally expected to impact traffic conditions, and therefore data associated with incidents is excluded. For floating car surveys, where the driver observes an incident, the floating car survey run is repeated. For commercial speed data, freeway incident data sets from PeMS are reviewed, and the speed data records for the corresponding time period are removed across all the relevant CMP segments.

The auto and transit monitoring methodologies for the 2020 LOS Monitoring Report will follow a similar approach to the 2018 LOS Monitoring Report and data will be collected in spring of 2020.

## Grandfathered LOS F Roadway Segments

CMP legislation exempts congested CMP roadway segments that did not meet the minimum LOS standards (LOS E) when the CMP network was formed (in 1991 and 1992) from deficiency identification and preparing a deficiency plan. These grandfathered segments were identified based on the LOS monitoring performed in 1991 for the CMP roadway segments and in 1992 for the CMP freeway-to-freeway connectors during the p.m. peak period, which is used for conformity. According to the study results, a total of 15 freeway segments (excluding freeway-to-freeway connectors) and 15 arterial segments were operating at LOS F in 1991 and five freeway-to-freeway connectors were operating at LOS F in 1992. Tables 3.3, 3.4, 3.5, and Figure 3.1 show the grandfathered CMP segments including the freeway-to-freeway connectors.

Although these segments are grandfathered by statute, they are not exempt from analysis and mitigation for the purpose of satisfying the Land Use Analysis Program (Chapter 6), the California Environmental Quality Act (CEQA), and the federal National Environmental Protection Act. The CMP focuses on existing congestion; therefore, Alameda CTC will considers strategies and/or improvements to address grandfathered segments in corridor studies, the Countywide Transportation Plan, and through the CMP Capital Improvement Program.

### Table 3.3—PM LOS F Freeways for Alameda County CMP-Designated Roadway Network

| | Roadway | | Limits | Jurisdiction | Average Speed (mph) |
|---|---|---|---|---|---|
| 1 | I-80 | EB | From Toll Plaza to I-580 Merge | Oakland | 21.2 |
| 2 | I-80 | EB | From I-80/I-580 (Merge) to Powell Street | Emeryville | 10.9 |
| 3 | I-80 | EB | From Powell Street to Ashby Avenue | Emeryville/Berkeley | 12.8 |
| 4 | I-80 | EB | From Ashby Avenue to University Avenue | Berkeley | 21.2 |
| 5 | I-80 | WB | From University Avenue to Ashby Avenue | Berkeley | 26.9 |
| 6 | I-80 | WB | From Ashby Avenue to Powell Street | Emeryville | 19.1 |
| 7 | I-80 | WB | From Toll Plaza to San Francisco County | Oakland | 22.6 |
| 8 | I-580 | EB | From Eden Canyon Road to San Ramon Road/ Foothill Road | Unincorporated/ Pleasanton | 23.9 |
| 9 | I-580 | EB | From San Ramon Road/Foothill Road to I-680 | Pleasanton | 14.9 |
| 10 | I-580 | EB | From I-680 to Hopyard Road | Pleasanton | 14.8 |
| 11 | I-580 | EB | From Hopyard Road to Santa Rita Road | Pleasanton | 26.7 |
| 12 | I-580 | EB | From 1st Street to Greenville Road | Livermore | 22.8 |
| 13 | I-580 | EB | From Greenville Road to North Flynn Road | Unincorporated | 21.0 |
| 14 | I-580 | EB | From I-80 to I-980 | Oakland | 19.5 |
| 15 | I-580 | EB | From I-980 to Harrison Street | Oakland | 15.7 |
| 16 | I-580 | EB | From Harrison Street to Lakeshore Avenue | Oakland | 20.8 |
| 17 | I-580 | WB | From SR-24 On-Ramp to I-80/I-580 Split | Oakland | 24.0 |
| 18 | I-680 | NB | From Scott Creek Road to SR-262/Mission Boulevard | Fremont | 23.3 |
| 19 | I-680 | NB | From SR-262/Mission Boulevard to Durham Road | Fremont | 9.0 |
| 20 | I-680 | NB | From Durham Road to Washington Boulevard | Fremont | 12.2 |

| | Roadway | | Limits | Jurisdiction | Average Speed (mph) |
|---|---|---|---|---|---|
| 21 | I-680 | NB | From Washington Boulevard to SR-238/ Mission Boulevard | Fremont | 20.8 |
| 22 | I-680 | NB | From SR-238/Mission to Vargas Road | Fremont | 22.2 |
| 23 | I-680 | NB | From Vargas Road to Andrade Road | Unincorporated | 20.2 |
| 24 | I-880 | NB | From Dixon Landing to SR-262/Mission Boulevard | Fremont | 25.1 |
| 25 | I-880 | NB | From Stevenson Boulevard to Decoto Road | Fremont | 27.0 |
| 26 | I-880 | NB | From Decoto Road to Alvarado Boulevard | Fremont | 18.7 |
| 27 | I-880 | NB | From Alvarado Boulevard to Alvarado-Niles Boulevard | Fremont/Union City | 22.4 |
| 28 | I-880 | NB | From Alvarado-Niles Boulevard to Tennyson Road | Union City/Hayward | 18.7 |
| 29 | I-880 | NB | From Tennyson Road to SR-92 | Hayward | 25.7 |
| 30 | I-880 | NB | From I-880/I-80 (Split) to I-880/I-80 (Merge) | Oakland | 13.6 |
| 31 | I-880 | SB | From I-880/I-80 (Split) to I-980 | Oakland | 22.3 |
| 32 | I-880 | SB | From I-980 to 23rd Avenue | Oakland | 14.4 |
| 33 | SR-13 | NB | From Moraga Avenue to Hiller Drive (Signal) | Oakland | 22.6 |
| 34 | SR-13 | SB | From Redwood Road to I-580 Eastbound (Merge) | Oakland | 13.7 |
| 35 | SR-24 | EB | From I-580 On-ramp to Broadway/SR-13 | Oakland | 20.2 |
| 36 | SR-24 | EB | From Broadway/SR-13 to the Caldecott Tunnel (Entrance) | Oakland | 12.9 |
| 37 | SR-24 | EB | From the Caldecott Tunnel (Entrance) to Fish Ranch Road | Oakland | 26.8 |
| 38 | SR-84 | EB | From Newark Boulevard/Ardenwood Boulevard to I-880 Northbound (Off-ramp) | Newark | 15.6 |

Source: Data is based on surveys taken during the afternoon peak period in September/October 1992.

## Table 3.4—PM LOS F Freeway-to-Freeway Connectors, Alameda County CMP-Designated Roadway Network

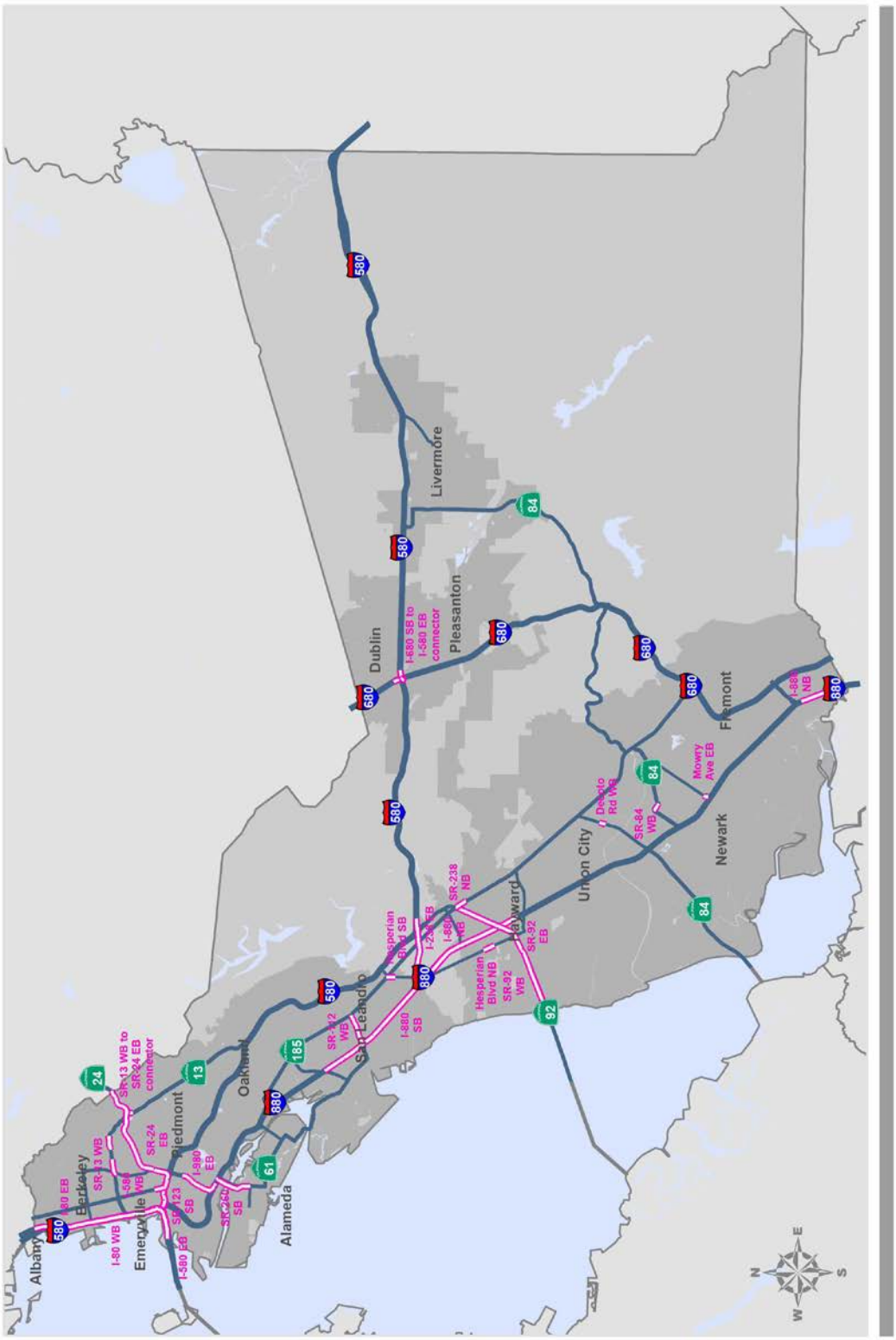
| | Roadway | Jurisdiction | Length (miles) | Average Speed (mph) | Free Flow Speed |
|---|---|---|---|---|---|
| 1 | I-80 SB to I-580 EB* | Oakland | 0.45 | 18.2 | 45.0 |
| 2 | SR-24 WB to I-580 EB | Oakland | 0.75 | 14.0 | 45.0 |
| 3 | SR-13 NB to SR-24 EB* | Oakland | 0.33 | 13.2 | 45.0 |
| 4 | I-880 SB to SR-260 WB | Oakland | 0.99 | 16.6 | |
| | SR-260 EB to I-880 NB | Oakland | 0.41 | 17.2 | |

Source: Data is based on surveys taken during the afternoon peak period in September/October 1992.
* LOS condition was first reported during the 1991 surveys.

## Table 3.5—PM LOS F Arterial Segments, Alameda County CMP-Designated Roadway Network

| | Roadway | | Limits | Jurisdiction | Arterial Class | Average Speed (mph) |
|---|---|---|---|---|---|---|
| 1 | SR-84 | EB | From Sunol Road to Pleasanton-Sunol Road | Fremont | Rural | 9.4 |
| 2 | SR-84 | EB | From SR-84 (Off)/I-680 to Vallecitos Lane | Unincorporated | Rural | 13.4 |
| 3 | SR-185 (International Boulevard) | SB | From Seminary Avenue to 73rd Avenue | Oakland | II | 7.9 |

Source: Based on surveys during the afternoon peak period (4 p.m. to 6 p.m.) in July-August and October 1991.


Legend
Level of Service "F" Segments
Interstate/Freeway (CMP - Tier 1 & MTS)
Other State Highway (CMP - Tier 1 & MTS)
Principal Arterial (CMP - Tier 1 & MTS)
NB Northbound
WB Westbound
SB Southbound
EB Eastbound
Figure 3.1: Congestion Management Program
Roadway Network (Grandfathered LOS F Segments)
ALAMEDA County Transportation Commission
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Leandro
Hayward
Union City
Newark
Fremont
Pleasanton
Dublin
Livermore
I-80 WB
I-80 EB
I-580 WB
I-580 EB
SR-13 WB to SR-24 EB connector
SR-24 EB
SR-13 WB
SR-13 SB
I-980 EB
SR-260 SB
I-880 SB
SR-112 WB
Hesperian Blvd SB
I-238 EB
I-880 NB
SR-238 NB
Hesperian Blvd NB
SR-92 WB
SR-92 EB
Decoto Rd WB
SR-84 WB
Mowry Ave EB
I-880 NB
I-680 SB to I-580 EB connector
580
680
880
84
92
185
61
24
13

## Comparison with Previous LOS Results

The results of LOS monitoring over the last two decades for the key commute corridors in Alameda County appear in Table 3.6, which shows overall traffic conditions and compares trends for long-distance trips on the CMP freeway network.

The 2018 LOS Monitoring Report stated that congestion on the CMP network generally decreased in 2018 as compared to 2016, resulting in fewer LOS F segments and an increased average speed on freeways, highways, and arterials. Speeds on urban arterial roads, however, had slower average speeds in 2018. Average speeds on most roads, including freeways, highways, and principal arterials, even with the increases seen in 2018, remain much slower and more congested than they were during the recession.

### Table 3.6—LOS Trends on the CMP-Designated Network (afternoon peak period)

| | | | | Year/Miles per Hour | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Road** | | **Limits** | **Mi.** | **91** | **92** | **94** | **96** | **98** | **00** | **02** | **04** | **06** | **08** | **10** | **12** | **14** | **16** | **18** |
| I-80 | EB | Bay Bridge Toll Plaza to Contra Costa line | 6 | 24 | 20 | 22 | 21 | 20 | 27 | 19 | 32 | 23 | 21 | 29 | 22 | 23 | 19 | 24 |
| I-80 | WB | Contra Costa line to Bay Bridge Toll Plaza | 6 | 25 | 24 | 23 | 25 | 28 | 18 | 22 | 28 | 28 | 36 | 27 | 26 | 26 | 27 | 37 |
| I-580 | EB | I-238 to I-205 | 30 | 56 | 55 | 55 | 55 | NA | 41 | 31 | 34 | 37 | 35 | 31 | 40 | 41 | NA | 37 |
| I-580 | WB | I-205 to I-238 | 30 | 57 | 56 | 55 | 55 | NA | 55 | 55 | 60 | 59 | 61 | 66 | 65 | 63 | NA | 62 |
| I-580 | EB | I-80 to I-238 | 16 | 53 | 52 | 44 | 53 | 60 | 63 | 55 | 43 | 39 | 47 | 42 | 41 | 40 | 34 | 43 |
| I-580 | WB | I-238 to I-80 | 15 | 58 | 56 | 51 | 52 | 61 | 63 | 60 | 57 | 55 | 63 | 60 | 54 | 60 | 57 | 63 |
| I-680 | NB | Scott Creek Road to Alcosta Boulevard | 21 | 58 | 57 | 57 | 52 | 51 | 58 | 51 | 42 | 53 | 43 | 40 | 42 | 30 | 23 | 41 |
| I-680 | SB | Alcosta Boulevard to Scott Creek Road | 21 | 59 | 58 | 55 | 61 | 67 | 63 | 62 | 66 | 59 | 63 | 66 | 66 | 67 | 66 | 67 |
| I-880 | NB | Dixon Landing Road to I-980 | 31 | 45 | 44 | 43 | 46 | 39 | 48 | 38 | 49 | 45 | 43 | 42 | 42 | 40 | 29 | 39 |
| I-880 | SB | I-980 to Dixon Landing Road | 31 | 43 | 40 | 38 | 46 | 50 | 49 | 41 | 39 | 37 | 48 | 46 | 48 | 46 | 41 | 48 |
| SR-13 | NB | Mountain Boulevard to Hiller Drive | 5 | 54 | 50 | 49 | 48 | 53 | 51 | 50 | 35 | 39 | 51 | 41 | 35 | 30 | 32 | 44 |
| SR-13 | SB | Hiller Drive to Mountain Boulevard | 5 | 56 | 59 | 53 | 47 | 59 | 60 | 55 | 54 | 49 | 49 | 39 | 43 | 42 | 32 | 37 |
| SR-24 | EB | I-580 to Fish Ranch Road | 5 | 30 | 29 | 30 | 24 | 39 | 33 | 21 | 40 | 26 | 24 | 18 | 18 | 15 | 14 | 19 |
| SR-24 | WB | Fish Ranch Road to I-580 | 4 | 54 | 58 | 54 | 50 | 60 | 57 | 61 | 59 | 59 | 58 | 67 | 60 | 56 | 62 | 63 |

Note: NA means data was not available due to the express lane ramp up period.

### Infill Opportunity Zones

Senate Bill 1636 (Figueroa), signed by the governor in 2002, established "infill opportunity zones" (IOZs) to encourage transit-supportive and infill developments. The statute exempted infill opportunity zones from the requirements to maintain the LOS E. None of the local jurisdictions within Alameda County established or adopted infill opportunity zones by the statute's sunset period of December 2009. However, Senate Bill 743 (Steinberg), passed in September 2013, instituted key changes to the CMP statute that will support infill development, including lifting the sunset date on designating IOZs and directing the governor's Office of Planning and Research to develop new metrics for assessment of transportation impacts to replace the LOS measure. Alameda CTC is currently developing the implementation guidelines regarding the new CEQA traffic impact analysis significance metric and requirements for Alameda County agencies, in coordination with similar efforts occurring across the region. Alameda CTC will continue to closely follow implementation of this law pertaining to the infill-opportunity zones in the context of supporting infill development efforts in Alameda County.

## Transit Performance Monitoring

Alameda CTC began monitoring transit performance on the Transit Monitoring Network (described in Chapter 2), beginning with the 2018 monitoring cycle. For the transit performance monitoring to be effective and to limit additional data collection required from the transit operators, Alameda CTC used a travel time measure that is consistent with data submitted by transit operators as part of the existing direct local distribution Master Program Funding Agreement (MPFA) with the operators. According to the agreement, the travel time metric is required to be reported biennially through the LOS Monitoring Report.

This travel time performance measure evaluates speeds of peak and non-peak bus services on the Transit Monitoring Network's roadway segments. With the same data, Alameda CTC will explore other possible reliability metrics. The performance standard for the travel time measure, as defined in the MPFA, is that average bus speeds should be at least 50 percent of prevailing auto speed or maintain or increase speed annually.

Note that similar to the auto LOS metric, the transit metric measures the operations of the roadway from a bus vehicle perspective. It does not measure outcomes of operational performance, such as ridership and on-time performance. These types of metrics, as well as outcome metrics for autos like VMT and mode share, are monitored in Alameda CTC's annual Performance Report at the system or county level. The metrics in the Performance Report meet the requirements of the MPFA.

## Local Government Responsibilities and Conformance

Alameda CTC is responsible for monitoring conformance of local jurisdictions with the adopted CMP.[11] Among the requirements, Alameda CTC must monitor compliance with the LOS standards. If a roadway segment does not conform to the LOS standards based on the biennial monitoring, Alameda CTC will notify the affected local jurisdiction that may elect to remedy the LOS problem or prepare a deficiency plan (see Chapter 10). If after 90 days the local jurisdiction is still in non-conformance, Alameda CTC is required to follow the conformance process as identified in Chapter 9, "Program Conformance and Monitoring." When a deficiency plan is adopted, status reports on the implementation of the deficiency plan showing progress must be

[11] California Government Code Section 65089.3.

submitted to Alameda CTC annually as part of the annual conformity process. The detailed process for finding of non-conformance and the resulting withholding of Proposition 111 funds is described in Chapter 9.

## Next Steps

- Continue to use speed-based HCM1985 for auto LOS monitoring for the Tier 1 network. Apply both HCM2000 and HCM1985 to the Tier 2 network as appropriate.
- Explore expanding the use of commercial speed or big data to survey all arterial and HOV/express lanes For HOV and express lanes, explore commercial speed data providers that capture lane-based speeds and use speed data collected from Alameda CTC's express lane operations.
- Explore potentially expanded or new and innovative monitoring of bicycle and pedestrian activity in the future.
- Explore opportunities for additional visualizations and summary snapshots in the 2020 LOS monitoring efforts and for developing an online portal for storing monitoring data and sharing information.
- Finalize guidelines to implement SB 743 in Alameda County including addressing the infill opportunity zones; identify impact to the CMP LOS monitoring element; and update the 2021 CMP to incorporate appropriate changes.