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2013 Orange County Congestion Management Program

Orange County Transportation Authority

September 2013

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Chapter 1: Introduction

Purpose & Need

In June 1990, the passage of the Proposition 111 gas tax increase required California's urbanized areas – areas with populations of 50,000 or more – to adopt a Congestion Management Program (CMP). The following year, Orange County's local governments designated the Orange County Transportation Authority (OCTA) as the Congestion Management Agency (CMA) for the County. As a result, OCTA is responsible for the development, monitoring, and biennial updating of Orange County's CMP.

The passage of Assembly Bill 2419, in July 1996, provided local agencies the option to elect out of the CMP process without the risk of losing state transportation funding. However, local jurisdictions in Orange County expressed a desire to continue the existing CMP process, because the requirements are similar to those of the Orange County Measure M Growth Management Program (GMP), and because it contributes to fulfilling federal requirements for the Congestion Management System (CMS), prepared by the Southern California Association of Governments (SCAG). The OCTA Board of Directors affirmed the decision to continue with the existing CMP process on January 13, 1997. Although the GMP ended with the sunset of Measure M, the CMP will remain relevant as an eligibility requirement under Measure M2.

As mentioned above, the CMP also contributes to federal CMS requirements, which work towards a systematic process to manage congestion and provide information to decision-makers on transportation system performance and alternative strategies for alleviating congestion and enhancing the mobility of persons and goods. This database of information on congestion can then be used for selecting and implementing cost effective strategies to manage new and existing facilities. The CMS also establishes performance measures to identify and monitor the extent of both recurring and non-recurring congestion and the effectiveness of congestion reduction and mobility enhancement strategies. Urban areas with populations over 200,000 and areas that are non-attainment for air quality such as Southern California are required to include

projects in the Transportation Improvement Program (TIP) that are part of the regional CMS.

CMP Goals

The goals of Orange County's CMP are to support regional mobility and air quality objectives by reducing traffic congestion; to provide a mechanism for coordinating land use and development decisions that support the regional economy; and to determine gas tax fund eligibility.

To meet these goals, the CMP contains a number of policies designed to monitor and address system performance issues. OCTA developed the policies that makeup Orange County's CMP in coordination with local jurisdictions, the California Department of Transportation (Caltrans), and the South Coast Air Quality Management District (SCAQMD).

State Legislation

Required Elements

California Government Code Section 65089(b) requires the CMP to include specific elements, as summarized below. The full text of the Government Code can be viewed at www.leginfo.ca.gov/calaw.html, sections 65088-65089.10.

Traffic Level of Service Standards – §65089(b)(1)(A) & (B)

Traffic level of service (LOS) standards shall be established for a system of highways and roadways. The highways and roadway system shall be designated by OCTA and shall include, at minimum, all state highways and principal arterials. None of the designated facilities may be removed, and new state highways and principal arterials must be added, except if they are within an infill opportunity zone. The LOS must be measured using a method that is consistent with the Highway Capacity Manual. The LOS standards must not be below level of service "E", unless the levels of service from the baseline CMP dataset were lower. If the LOS does not meet the minimum standard and is outside an infill opportunity zone, a deficiency plan must be adopted.

Chapter two specifically addresses this element.

Performance Measures – §65089(b)(2)

Performance measures shall be established to evaluate the current and future performance of the transportation system. At a minimum, measures must be established for the highway and roadway system, frequency and routing of public transit, and for the coordination of transit service by separate operators. These measures will be used to support improvements to mobility, air quality, land use, and

economic objectives and shall be incorporated into the Capital Improvement Program, the Land Use Analysis Program, and any required deficiency plans.

Chapters two and three specifically address this element.

Travel Demand – §65089(b)(3)

A travel demand element shall be established to promote alternative transportation methods, improve the balance between jobs and housing, and other trip reduction strategies. These methods and strategies may include, but are not limited to, carpools, vanpools, transit, bicycles, park-and-ride lots, flexible work hours, telecommuting, parking management programs, and parking cash-out programs.

Chapter four specifically addresses this element.

Land Use Analysis Program – §65089(b)(4)

A program shall be established to analyze the impacts of land use decisions on the transportation system, using the previously described performance measures. The analysis must also include cost estimates associated with mitigating those impacts. To avoid duplication, this program may require implementation through the requirements and analysis of the California Environmental Quality Act.

Chapter five specifically addresses this element.

Capital Improvement Program – §65089(b)(5)

The CMP shall use the performance measures described above to determine effective projects that mitigate impacts identified in the land use analysis program, through an adopted seven-year capital improvement program. This seven-year program will conform to transportation-related air quality mitigation measures and will include any projects that increase the capacity of the transportation system. Furthermore, consideration will be given to maintaining or improving bicycle access and safety within the project areas. Projects necessary for preserving investments in existing facilities may also be included.

Chapter six specifically addresses this element.

CMA Requirements

As Orange County's CMA, OCTA is responsible for the administration of the CMP, as well as providing data and models that are consistent with those used by the Southern California Association of Governments (SCAG). OCTA is also responsible for developing the deficiency plan processes. These requirements are described in the legislation, and are summarized below.

Modeling and Data Consistency – §65089(c)

In consultation with SCAG and local jurisdictions, OCTA shall develop a uniform data base on traffic impacts for use in a countywide transportation computer model. Moreover, OCTA shall approve transportation models that will be used by local jurisdictions to determine the quantitative impacts of development on the circulation system. Every local jurisdiction's traffic model must be based on the countywide model and standardized modeling assumptions and conventions. All models and databases shall be consistent with the modeling methodology and databases used by SCAG.

Appendix D, Attachment 1, addresses this requirement.

Deficiency Plan Procedures – §65089.4

OCTA is responsible for preparing and adopting procedures for local deficiency plan development and implementation. OCTA's deficiency plan procedures must incorporate a methodology for determining if deficiency impacts are caused by more than one local jurisdiction within Orange County; in which case a multi-jurisdictional deficiency plan, adopted by all participating local jurisdictions, may be required. They must also establish a conflict resolution process for addressing conflicts or disputes between local jurisdictions in meeting the multi-jurisdictional deficiency plan responsibilities.

Chapter two discusses this requirement in more detail.

Chapter 2: Highway Level of Service

Level of Service Standards

In 1991, the OCTA implemented an Intersection Capacity Utilization (ICU) monitoring method, developed with technical staff members from local and State agencies, for measuring the Level of Service (LOS) at CMP Highway System (CMPHS) intersections. The CMP LOS grade chart is illustrated in Figure 1.

FIGURE 1: LOS Grade Chart

Level of Service	ICU Rating
A	0.00 – 0.60
B	0.61 – 0.70
C	0.71 – 0.80
D	0.81 – 0.90
E	0.91 – 1.00
F	> 1.00

The first CMP LOS measurement recorded, which was in 1992 for most CMP intersections, established the baseline for comparing future measurements. During subsequent LOS monitoring, CMP statute requires that CMPHS intersections maintain a LOS grade of 'E' or better, unless the baseline is lower than 'E'; in which case, the ICU rating cannot increase by more than 0.10. The *Highway & Roadway System Performance Measures* section discusses the ICU method in more detail.

OCTA has an established CMPHS, consisting of Orange County's State highways and the arterials included in OCTA's Smart Street network (Figure 3). If, during any monitoring period, a CMPHS intersection is determined to be performing below the LOS standards the responsible agency must identify improvements necessary to meet the LOS standards. This is accomplished either through existing plans or capital improvement programs, or through the development of a deficiency plan. This is described in more detail in the *Deficiency Plans* section below.

The 2013 freeway monitoring results, provided by Caltrans District 12, are located in Appendix A. Caltrans is responsible for monitoring freeway performance and addressing

any deficiencies on State operated facilities. Caltrans' responsibilities include, but are not limited to:

A. Evaluating current conditions and identifying deficiencies.

B. Developing plans and strategies to address deficiencies.

C. Evaluating development projects of local and regional significance to determine whether they will impact the State transportation system and, if so, working with lead agencies to develop potential mitigation measures.

For the State transportation system, Caltrans does not use CMP thresholds and analysis methodologies to determine if significant impacts occur under CEQA. Local agencies are encouraged to coordinate with the Caltrans Local Development/ Intergovernmental Review Branch early in the development process to determine what methodologies and thresholds of significance should be used to identify impacts to the State transportation system.

Highway & Roadway System Performance Measures

This section discusses the process for determining ICU ratings, as well as how ICU ratings determine the LOS at CMPHS intersections. This method is generally consistent with the Highway Capacity Manual.

Overview of Intersection Capacity Utilization (ICU) Methodology

Traffic counts are manually collected at CMPHS intersections to initiate the ICU calculation process. The counts monitor the traffic flow, including the approach (northbound, eastbound, southbound, or westbound) and movement (left turn, through, or right turn) for each vehicle.

Each intersection has counts conducted in 15-minute increments, during peak periods in the AM (6:00-9:00) and PM (3:00-7:00) on three separate mid-week days (Tuesday, Wednesday, and Thursday). Counts are not taken during periods when irregular conditions exist (inclement weather, holidays, construction, etc.).

The highest count total during any four consecutive 15-minute count intervals within a peak period represents the peak-hour count set. For each intersection, a peak-hour count set is determined for each day's AM and PM peak period, resulting in a group of three AM peak-hour count sets and a group of three PM peak-hour count sets.

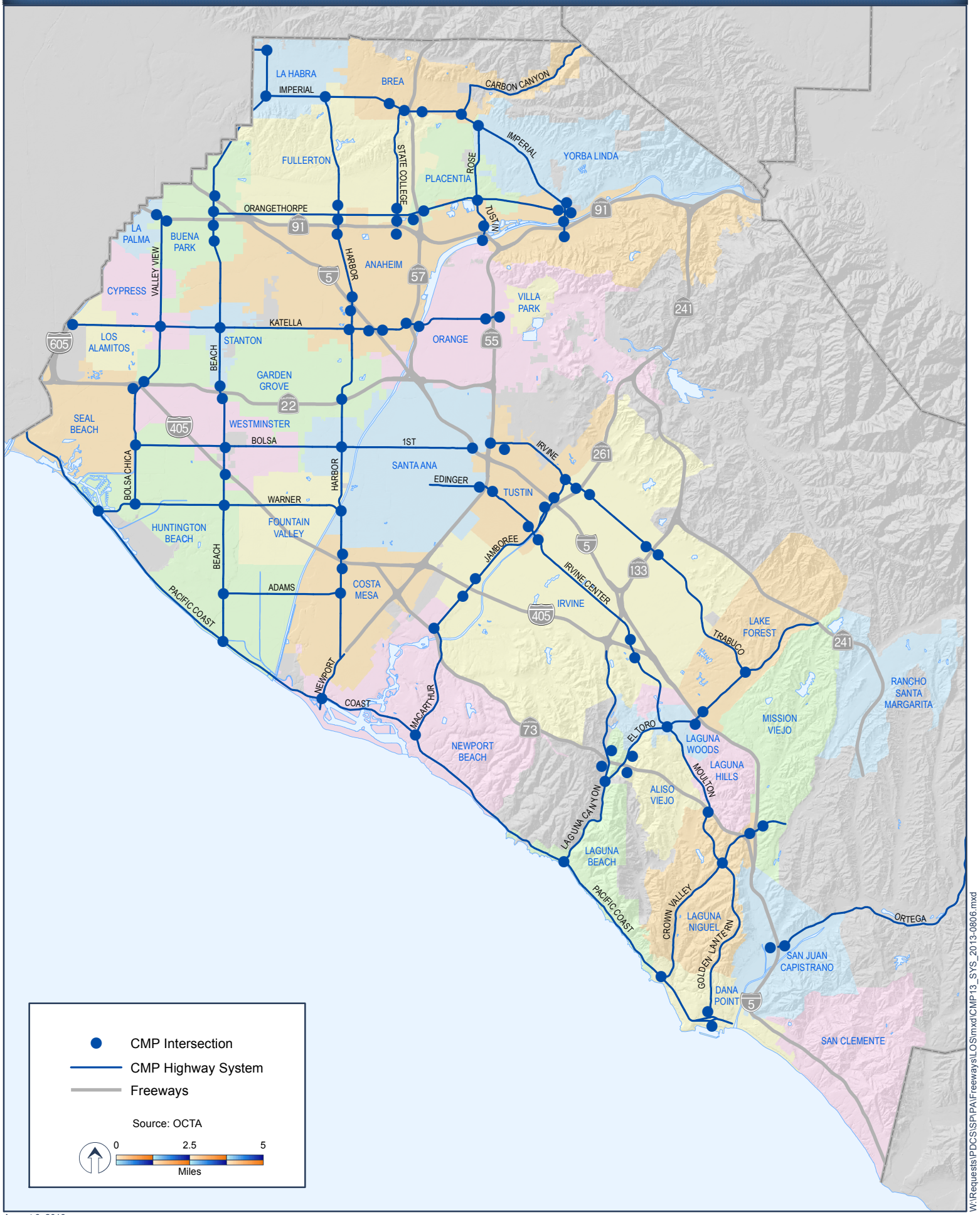
The group of AM peak-hour count sets is averaged, as is the group of PM peak-hour count sets. The results are the volumes used to determine AM and PM volume-to-capacity (V/C) ratios for each movement through the intersection. A number of assumptions determine the capacities for each movement.

An example of an assumption used to determine capacity is the saturation flow-rate, which represents the theoretical maximum number of vehicles that are able to move through an intersection in a single lane during a green light phase. In 1991, OCTA and the technical staff members from local and State agencies agreed upon a saturation flow-rate of 1,700 vehicles per lane per hour. However, other factors can adjust this assumption.

Such factors include right turn lanes, which can increase the saturation flow-rate by 15% in specific circumstances. Right turn overlaps (signalized right turn lanes that are green during the cross traffic's left turn movements) and free right turns (lanes in which vehicles are allowed to turn right without stopping, even when the through signal is red) are some of the circumstances that will increase the saturation flow-rate. If right turns on red are permitted, a *de facto* right turn lane (approaches that do not have designated right turn lanes, but which are at least 19 feet wide and prohibit on-street parking during peak hours) may also increase the saturation flow rate.

Roadway capacity can also be reduced under certain conditions. For example, if a lane is shared for through and turn movements, the saturation flow-rate of 1,700 could be reduced. This occurs only when the turn movement volumes reach a certain threshold that is calculated for each intersection with shared lanes. The reduction represents the slower turning movements interfering with through movements.

Figure 2: 2013 Congestion Management Program Highway System



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Finally, if field observations indicate the presence of more than 100 pedestrians per hour at an intersection, then pedestrian counts are conducted simultaneously with vehicle counts. Saturation flow-rate calculations then factor in the impacts of pedestrian activity for effected lanes, using standard reductions in accordance with Chapter 16 of the Highway Capacity Manual.

Once the V/C ratios are determined for each movement, critical V/C ratios are calculated. Conflicting movements determine which V/C ratios are included in the calculation of the critical V/C ratios. Conflicting movements represent a situation where a movement from one approach prevents a movement from the opposite approach. For example, if through movements are being made from the southbound approach, left turn movements cannot simultaneously be made from the northbound approach. For each set of opposing approaches (north/south and east/west), the two conflicting movements with the greatest summed V/C ratios are identified. These summed V/C ratios then become known as the critical V/C ratios.

OCTA and technical staff members from local and State agencies also agreed upon a lost time factor of 0.05 in 1991. The lost time factor represents the assumed amount of time it takes for a vehicle to travel through an intersection. For each intersection, the critical V/C ratios are summed (north/south + east/west), and the lost time factor is added to the sum, producing the ICU rating for the intersection.

Based on a set of ICU rating ranges, which were agreed upon by OCTA and technical staff members from local and State agencies, grades are assigned to each intersection. The grades indicate the LOS for intersections, and are used to determine whether the intersections meet the performance standards described at the beginning of the chapter.

The 2013 LOS ratings for the CMP intersections have been mapped in Figure 3. The map in Figure 4 displays the LOS changes since the 2011 CMP report. Finally, a spreadsheet of the baseline and 2013 LOS ratings for the CMP intersections, and corresponding ICU measurements, is located in Figure 5.

Note that in Figure 5, Orange County's average ICU rating has improved over the baseline. Between 1991 and 2013, the average AM ICU improved from 0.67 to 0.59 (a 13.25 percent improvement), and the PM ICU improved from 0.72 to 0.63 (a 13.58 percent improvement). The ICU improvements indicate that Orange County agencies are effectively operating, maintaining, and improving the CMP Highway System.

Figure 3: 2013 CMP Intersection Level of Service

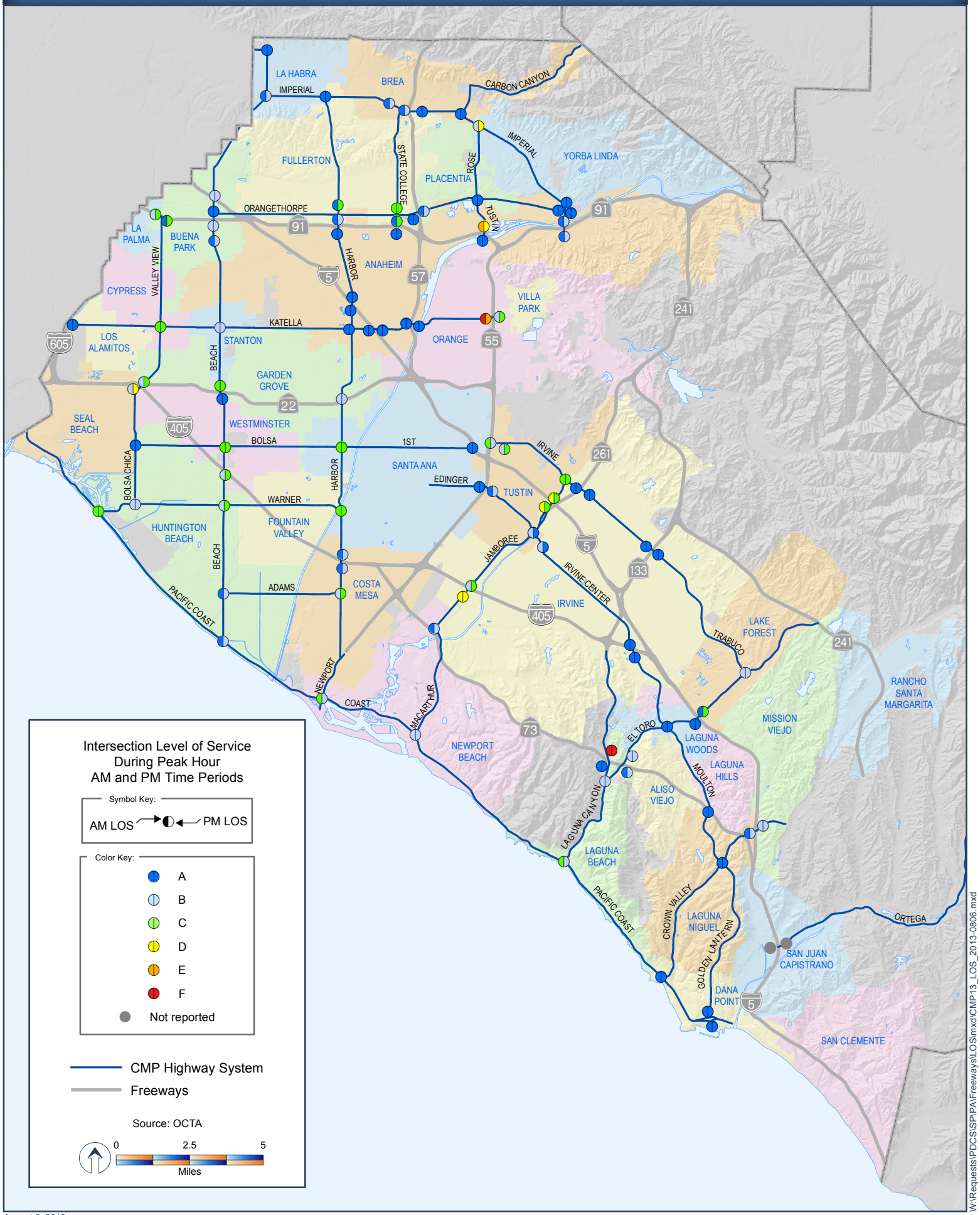

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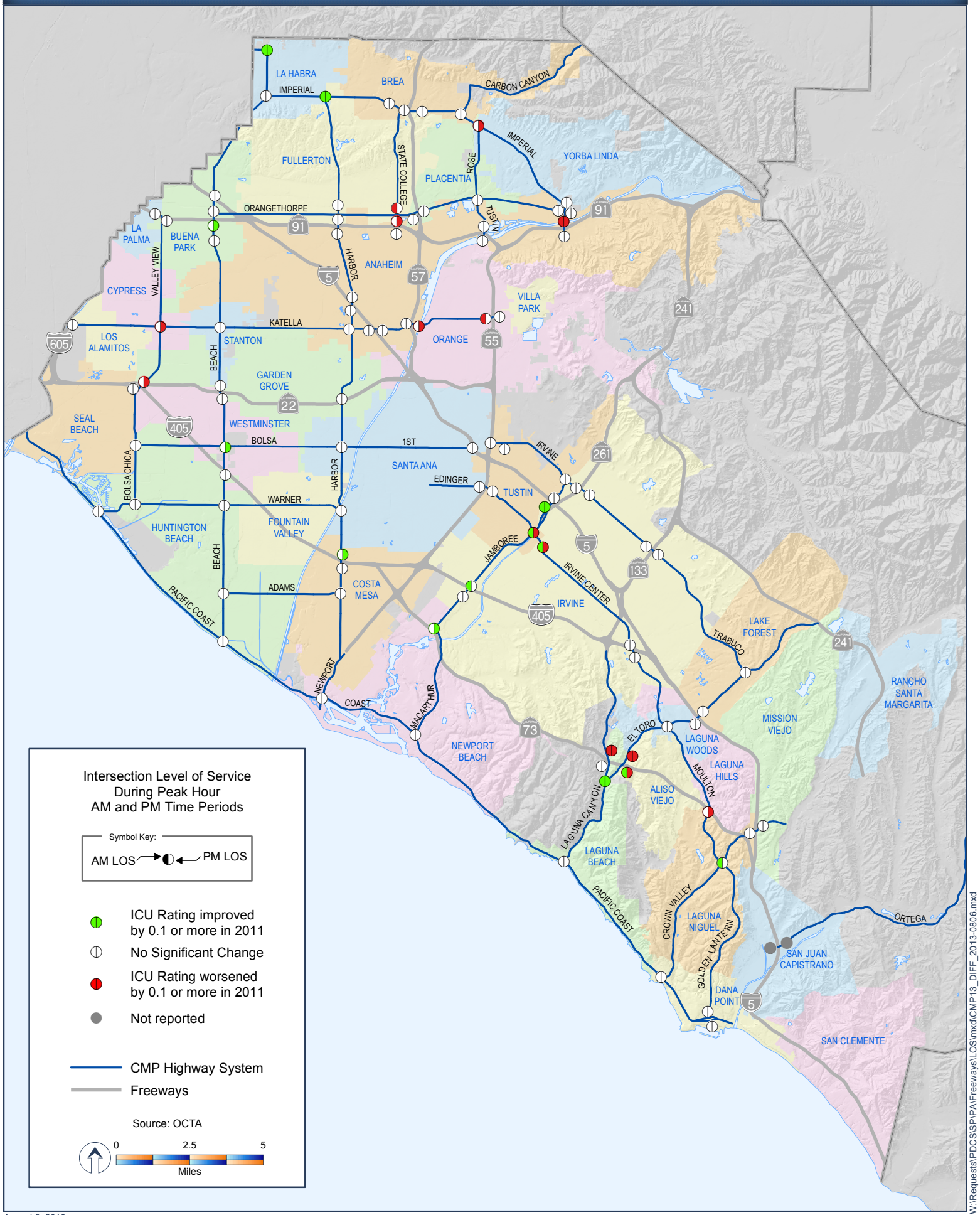
Figure 4: 2011 vs. 2013 CMP Intersection Level of Service



Intersection Level of Service
During Peak Hour
AM and PM Time Periods

Symbol Key:

AM LOS → ◐ ← PM LOS

- ICU Rating improved by 0.1 or more in 2011
- No Significant Change
- ICU Rating worsened by 0.1 or more in 2011
- Not reported

CMP Highway System

Freeways

Source: OCTA

0 2.5 5

Miles

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Figure 5: 2013 CMP Level of Service Chart

Orange County Congestion Management Program
LEVEL OF SERVICE 2013

Intersection/Interchange	Jurisdiction	Baseline AM		2013 AM		Baseline PM		2013 PM		Percent Change	
		LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	AM ICU	PM ICU
Anaheim Blvd-I-5 NB Ramp/Katella Avenue	Anaheim	A	0.49	A	0.44	D	0.82	A	0.53	-10.20%	-35.37%
Harbor Blvd./Katella Avenue	Anaheim	A	0.53	A	0.54	B	0.67	A	0.57	1.89%	-14.93%
I-5 SB Ramp\Harbor Boulevard	Anaheim	A	0.29	A	0.26	A	0.31	A	0.32	-10.34%	3.23%
SR-91 EB Ramp/Harbor Boulevard	Anaheim	A	0.46	A	0.45	A	0.52	A	0.59	-2.17%	13.46%
I-5 NB Ramp/Harbor Boulevard	Anaheim	A	0.52	A	0.47	A	0.54	A	0.52	-9.62%	-3.70%
I-5 SB Ramp/Katella Avenue	Anaheim	A	0.48	A	0.53	A	0.41	A	0.55	10.42%	34.15%
Imperial Highway/Orangethorpe Avenue[1]	Anaheim	B	0.67	--	--	D	0.89	--	--	--	--
SR-57 NB Ramps/Katella Avenue	Anaheim	A	0.51	A	0.38	A	0.41	A	0.55	-25.49%	34.15%
SR-57 SB Ramps/Katella Avenue	Anaheim	A	0.52	A	0.39	A	0.51	A	0.50	-25.00%	-1.96%
SR-91 EB Ramp/Imperial Highway	Anaheim	C	0.73	A	0.53	C	0.79	B	0.67	-27.40%	-15.19%
SR-91 EB Ramps/State College Boulevard	Anaheim	B	0.69	A	0.48	D	0.82	A	0.58	-30.43%	-29.27%
SR-91 EB Ramps/Tustin Avenue	Anaheim	B	0.66	A	0.59	D	0.84	A	0.56	-10.61%	-33.33%
SR-91 WB Ramp/Harbor Boulevard	Anaheim	B	0.61	A	0.58	C	0.77	B	0.68	-4.92%	-11.69%
SR-91 WB Ramp/Imperial Highway	Anaheim	C	0.71	A	0.59	B	0.63	B	0.70	-16.90%	11.11%
SR-91 WB Ramp/State College Boulevard	Anaheim	A	0.55	A	0.52	B	0.63	C	0.76	-5.45%	20.63%
SR-91 WB Ramps/Tustin Avenue	Anaheim	B	0.64	E	0.91	A	0.60	D	0.85	42.19%	41.67%
Imperial Highway SB Off-Ramp/Orangethorpe Avenue[2]	Anaheim	A	0.41	A	0.51	A	0.42	A	0.42	24.39%	0.00%
Imperial Highway NB On-Ramp/Esperanza Avenue[2]	Anaheim	A	0.26	A	0.30	A	0.30	A	0.29	15.38%	-3.33%
Imperial Highway/Orangethorpe Avenue Ramps[2]	Anaheim	A	0.32	A	0.49	A	0.39	A	0.46	53.13%	17.95%
SR-57 SB Ramps/Imperial Highway	Brea	B	0.68	A	0.55	B	0.70	B	0.63	-19.12%	-10.00%
State College Boulevard/Imperial Highway	Brea	C	0.73	A	0.56	E	0.93	B	0.70	-23.29%	-24.73%
Valencia Avenue/Imperial Highway	Brea	A	0.56	A	0.49	A	0.59	A	0.46	-12.50%	-22.03%
SR-57 NB Ramps/Imperial Highway	Brea	C	0.78	A	0.57	E	0.91	A	0.58	-26.92%	-36.26%
Beach Boulevard/Orangethorpe Avenue	Buena Park	C	0.76	A	0.60	D	0.87	A	0.60	-21.05%	-31.03%
I-5 SB Ramps/Beach Boulevard	Buena Park	C	0.72	B	0.65	C	0.78	B	0.66	-9.72%	-15.38%
SR-91 EB Ramp/Beach Boulevard	Buena Park	C	0.74	A	0.55	D	0.84	B	0.61	-25.68%	-27.38%
SR-91 EB Ramp/Valley View Street	Buena Park	A	0.58	A	0.57	D	0.86	C	0.72	-1.72%	-16.28%
SR-91 WB Ramp/Beach Boulevard	Buena Park	A	0.58	B	0.62	A	0.59	B	0.64	6.90%	8.47%
SR-91 WB Ramp/Valley View Street	Buena Park	C	0.80	B	0.67	E	0.94	C	0.78	-16.25%	-17.02%
Harbor Boulevard/Adams Avenue	Costa Mesa	E	0.99	B	0.67	F	1.09	C	0.76	-32.32%	-30.28%
I-405 SB Ramps/Harbor Boulevard	Costa Mesa	A	0.53	A	0.47	B	0.63	B	0.63	-11.32%	0.00%
I-405 NB Ramps/Harbor Boulevard	Costa Mesa	E	0.95	A	0.51	F	1.07	B	0.66	-46.32%	-38.32%
Valley View Street/Katella Avenue	Cypress	B	0.63	C	0.71	D	0.87	C	0.79	12.70%	-9.20%
Crown Valley Parkway/Bay Drive/PCH	Dana Point	F	1.41	A	0.56	F	1.62	A	0.58	-60.28%	-64.20%
Street of the Golden Lantern/Del Prado Avenue	Dana Point	A	0.32	A	0.33	A	0.53	A	0.44	3.13%	-16.98%
Street of the Golden Lantern/PCH	Dana Point	A	0.42	A	0.45	A	0.55	A	0.54	7.14%	-1.82%
Harbor Boulevard/Orangethrope Avenue	Fullerton	A	0.60	A	0.60	E	0.94	C	0.76	0.00%	-19.15%
State College Boulevard/Orangethorpe Avenue	Fullerton	C	0.80	B	0.70	D	0.86	C	0.72	-12.50%	-16.28%

Figure 5: 2013 CMP Level of Service Chart

Orange County Congestion Management Program
LEVEL OF SERVICE 2013

Intersection/Interchange	Jurisdiction	Baseline AM		2013 AM		Baseline PM		2013 PM		Percent Change	
		LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	AM ICU	PM ICU
SR-22 WB Ramp/Valley View Street	Garden Grove	C	0.76	B	0.68	D	0.87	C	0.71	-10.53%	-18.39%
SR-22 WB Ramps/Harbor Boulevard	Garden Grove	F	1.10	B	0.68	F	1.16	B	0.66	-38.18%	-43.10%
SR-22 WB/Beach Boulevard	Garden Grove	C	0.73	C	0.77	C	0.73	C	0.74	5.48%	1.37%
Beach Boulevard/405 SB Ramp/Edinger Avenue	Huntington Beach	B	0.63	B	0.68	E	1.03	C	0.78	7.94%	-24.27%
Beach Boulevard/Adams Avenue	Huntington Beach	A	0.55	A	0.51	C	0.67	B	0.61	-7.27%	-8.96%
Beach Boulevard/Pacific Coast Highway	Huntington Beach	A	0.45	A	0.56	A	0.47	B	0.61	24.44%	29.79%
Beach Boulevard/Warner Avenue	Huntington Beach	C	0.78	B	0.67	E	0.93	C	0.72	-14.10%	-22.58%
Bolsa Chica Street/Bolsa Avenue	Huntington Beach	B	0.66	A	0.57	A	0.53	A	0.51	-13.64%	-3.77%
Bolsa Chica Street/Warner Avenue	Huntington Beach	A	0.57	B	0.67	D	0.81	B	0.67	17.54%	-17.28%
Pacific Coast Highway/Warner Avenue	Huntington Beach	D	0.81	C	0.72	B	0.72	C	0.73	-11.11%	1.39%
SR-133 NB Ramps/Irvine Boulevard	Irvine	A	0.37	A	0.48	A	0.33	A	0.48	29.73%	45.45%
SR-133 SB Ramps/Irvine Boulevard	Irvine	A	0.37	A	0.37	A	0.29	A	0.41	0.00%	41.38%
SR-261 NB Ramps/Irvine Boulevard	Irvine	A	0.38	A	0.40	A	0.53	A	0.56	5.26%	5.66%
SR-261 SB Ramps/Irvine Boulevard	Irvine	A	0.42	A	0.39	A	0.40	A	0.46	-7.14%	15.00%
I-405 NB Ramps/Enterprise/Irvine Center Drive	Irvine	E	0.95	A	0.57	A	0.39	A	0.53	-40.00%	35.90%
I-405 NB Ramps/Jamboree Road	Irvine	F	1.03	B	0.64	C	0.78	C	0.75	-37.86%	-3.85%
I-405 SB Ramps/Irvine Center Drive	Irvine	E	1.00	A	0.55	A	0.57	A	0.51	-45.00%	-10.53%
I-405 SB Ramps/Jamboree Road	Irvine	E	0.92	D	0.86	B	0.66	D	0.87	-6.52%	31.82%
I-5 NB Ramps/Jamboree Road	Irvine	A	0.54	D	0.83	C	0.75	C	0.73	53.70%	-2.67%
I-5 SB Ramps/Jamboree Road	Irvine	A	0.40	D	0.84	A	0.35	C	0.76	110.00%	117.14%
MacArthur Boulevard/Jamboree Road	Irvine	B	0.61	A	0.56	B	0.69	B	0.64	-8.20%	-7.25%
Harbor Boulevard/Imperial Highway	La Habra	D	0.81	A	0.58	D	0.86	B	0.61	-28.40%	-29.07%
Beach Boulevard/Imperial Highway	La Habra	D	0.85	A	0.55	D	0.87	A	0.59	-35.29%	-32.18%
Beach Boulevard/Whittier Boulevard	La Habra	A	0.33	A	0.44	A	0.29	A	0.46	33.33%	58.62%
El Toro Road/SR-73 NB Ramps	Laguna Beach	E	0.91	B	0.66	A	0.59	B	0.70	-27.47%	18.64%
El Toro Road/SR-73 SB Ramps	Laguna Beach	A	0.41	A	0.45	B	0.67	B	0.70	9.76%	4.48%
Laguna Canyon Rd/SR-73 NB Ramps	Laguna Beach	C	0.73	F	1.10	C	0.72	F	1.05	50.68%	45.83%
Laguna Canyon Rd/SR-73 SB Ramps	Laguna Beach	A	0.32	A	0.36	A	0.33	A	0.41	12.50%	24.24%
Laguna Canyon Road/El Toro Road	Laguna Beach	F	1.54	B	0.65	F	1.16	B	0.65	-57.79%	-43.97%
Laguna Canyon Road/Pacific Coast Highway	Laguna Beach	D	0.84	C	0.77	C	0.74	B	0.62	-8.33%	-16.22%
I-5 SB Ramp/Avenue de la Carlotta/El Toro Road	Laguna Hills	F	1.18	A	0.48	F	1.13	A	0.59	-59.32%	-47.79%
Moulton Parkway/SR-73 SB Ramps	Laguna Niguel	A	0.45	A	0.39	A	0.38	A	0.44	-13.33%	15.79%
Moulton Parkway/Crown Valley Parkway	Laguna Niguel	A	0.56	A	0.52	B	0.65	A	0.57	-7.14%	-12.31%
Moulton Parkway/El Toro Road	Laguna Woods	E	0.94	A	0.51	F	1.26	A	0.53	-45.74%	-57.94%
I-5 NB/Bridger/El Toro Road	Lake Forest	A	0.56	A	0.57	D	0.81	C	0.72	1.79%	-11.11%
Trabuco Road/El Toro Road	Lake Forest	F	1.03	B	0.69	C	0.80	B	0.63	-33.01%	-21.25%

Figure 5: 2013 CMP Level of Service Chart

Orange County Congestion Management Program
LEVEL OF SERVICE 2013

Intersection/Interchange	Jurisdiction	Baseline AM		2013 AM		Baseline PM		2013 PM		Percent Change	
		LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	AM ICU	PM ICU
I-605 NB Ramps/Katella Avenue	Los Alamitos	B	0.69	A	0.35	B	0.65	A	0.54	-49.28%	-16.92%
I-5 NB Ramps/Crown Valley Parkway	Mission Viejo	B	0.68	B	0.64	B	0.69	B	0.62	-5.88%	-10.14%
I-5 SB Ramps/Crown Valley Parkway	Mission Viejo	D	0.86	A	0.58	F	1.01	B	0.65	-32.56%	-35.64%
MacArthur Boulevard/Pacific Coast Highway	Newport Beach	A	0.51	B	0.65	B	0.70	B	0.69	27.45%	-1.43%
Newport Boulevard/Pacific Coast Highway	Newport Beach	A	0.56	C	0.78	A	0.49	B	0.66	39.29%	34.69%
SR-55 NB Ramps/Sacramento/Katella Avenue	Orange	C	0.75	B	0.70	D	0.85	C	0.80	-6.67%	-5.88%
SR-55 SB Ramps/Katella Avenue	Orange	C	0.73	F	1.09	E	0.95	E	0.91	49.32%	-4.21%
Rose Drive/Imperial Highway	Placentia	E	0.95	B	0.70	E	0.99	D	0.90	-26.32%	-9.09%
Rose Drive/Tustin Avenue/Orangethorpe Avenue	Placentia	C	0.76	A	0.53	F	1.03	A	0.51	-30.26%	-50.49%
SR-57 NB Ramps/Orangethorpe Avenue	Placentia	B	0.67	A	0.51	C	0.80	B	0.65	-23.88%	-18.75%
SR-57 SB Ramps/Iowa Place/Orangethrope Avenue	Placentia	C	0.74	A	0.43	B	0.69	A	0.46	-41.89%	-33.33%
I-5 NB Ramps/Ortega Highway[3]	San Juan Capistrano	A	0.52	--	--	A	0.58	--	--	--	--
I-5 SB Ramps/Ortega Highway[3]	San Juan Capistrano	B	0.61	--	--	C	0.77	--	--	--	--
Harbor Boulevard/1st Street	Santa Ana	A	0.48	C	0.73	D	0.81	C	0.74	52.08%	-8.64%
Harbor Boulevard/Warner Avenue	Santa Ana	E	0.93	C	0.75	E	0.98	C	0.79	-19.35%	-19.39%
I-5 SB Ramps/1st Street	Santa Ana	A	0.29	A	0.43	A	0.46	A	0.57	48.28%	23.91%
SR-55 SB Ramp/Auto Mall/Edinger Avenue	Santa Ana	D	0.90	A	0.53	F	1.06	A	0.59	-41.11%	-44.34%
SR-55 SB Ramps/Irvine Boulevard (Fourth Street)	Santa Ana	B	0.68	C	0.78	D	0.83	B	0.64	14.71%	-22.89%
Beach Boulevard/Katella Avenue	Stanton	D	0.89	B	0.70	F	1.02	B	0.65	-21.35%	-36.27%
Jamboree Road/Edinger Avenue-NB Ramp	Tustin	A	0.28	B	0.62	A	0.32	A	0.59	121.43%	84.38%
Jamboree Road/Edinger Avenue-SB Ramp	Tustin	D	0.81			A	0.41				
Jamboree Road/Irvine Boulevard	Tustin	B	0.65	C	0.76	A	0.59	C	0.73	20.00%	16.95%
SR-55 NB Ramps/Edinger Avenue	Tustin	C	0.72	A	0.45	B	0.65	B	0.70	-30.56%	13.85%
SR-55 NB Ramps/Irvine Boulevard	Tustin	A	0.59	B	0.67	A	0.45	C	0.77	15.25%	71.11%
Beach Boulevard/Bolsa Avenue	Westminster	F	1.09	C	0.79	F	1.11	C	0.72	-27.52%	-35.14%
Bolsa Chica Road/Garden Grove Boulevard	Westminster	E	0.91	B	0.69	E	0.97	D	0.85	-24.18%	-12.37%
SR-22 EB/Beach Boulevard	Westminster	A	0.53	A	0.56	A	0.54	A	0.52	5.66%	-3.70%
COUNTY AVERAGE			0.67		0.59		0.72		0.63	-13.25%	-13.58%

Notes:

[1] Imperial Highway/Orangethorpe Avenue was reconstructed as part of the Imperial Highway Grade Separation Project.

[2] New CMP locations at Imperial Highway/Orangethorpe Avenue as part of the Imperial Highway Grade Separation Project.

[3] The Interstate 5 and Ortega Highway Overcrossing was under reconstruction at the time of data collection, and was not included in this update.

Deficiency Plans

If an intersection does not meet the LOS standards, then a deficiency plan is required, as described under California Government Code Section 65089.4. The deficiency plan identifies the cause of congestion, the improvements needed to solve the problem, and the cost and timing for implementing the proposed improvements.

A deficiency plan process has been developed by the CMP Technical Advisory Committee to provide local jurisdictions with a framework for maintaining compliance with the CMP when a portion of the CMPHS fails to meet its established LOS standard (Appendix C-1). The Deficiency Plan Decision Tree (Appendix C-2) illustrates the individual steps that must be taken in order for a local jurisdiction to meet CMP deficiency plan requirements.

Deficiency plans are not required if a deficient intersection is brought into compliance within 18 months of its initial detection, using improvements that have been previously planned and programmed in the CMP Capital Improvement Program. In addition, CMP legislation specifies that the following shall be excluded from deficiency determinations:

- Interregional travel (trips with origins outside the Orange County CMPHS)
- Construction, rehabilitation, or maintenance of facilities that impact the system
- Freeway ramp metering
- Traffic signal coordination by the State or multi-jurisdictional agencies
- Traffic generated by the provision of low-income and very low-income housing
- Traffic generated by high-density residential development located within one-quarter mile of a fixed rail passenger station
- Traffic generated by any mixed-use development located within one-quarter mile of a fixed rail passenger station, but only if more than half of the land area, or floor area, of the mixed-use development is used for high-density residential housing.

Two Orange County CMP intersections exceeded their CMP level of service standard in 2013; however, they are both Caltrans (State) operated and controlled and, therefore, are statutorily exempt from the deficiency plan process.

- *Laguna Canyon Road/State Route 73 northbound ramps (City of Laguna Beach)* – ICU 1.10 (LOS F) in the AM peak hour and ICU 1.05 (LOS F) in the PM peak hour
- *State Route 55 southbound ramps/Katella Avenue (City of Orange)* – ICU 1.09 (LOS F) in the AM peak hour

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Chapter 3: Transit Service

As Orange County's transit provider, OCTA continually monitors the frequency and routing of its transit services. Bus and rail transit are essential components of Orange County's transportation system, and are important tools for achieving a balanced multi-modal transportation system capable of maintaining level of service standards.

The CMP performance measures provide an index of the effectiveness and efficiency of Orange County's fixed-route bus and commuter rail services. ACCESS, OCTA's complementary paratransit service, is not included separately in the CMP analysis because it is an extension of the fixed-route service.

The OCTA Board approved "Systemwide Bus Service Standards & Policies" are the basis for the performance analysis included in the CMP. The standards and policies allow for identification of areas in need of additional resources in transit service. Furthermore, once adequate transit operating funds are available, the transit performance measures will work to ensure that bus and rail services meet demand and are coordinated between counties.

Fixed-Route Bus Service

"OCTA's fixed route bus service includes local routes, express routes, community routes, limited-stop/BRT routes, rail feeder and shuttle routes.

- Local routes (numbered 1 to 99) operate primarily along arterial corridors serving multiple bus stops spaced about 1/4 –mile apart, serving multiple destinations such as residential areas, employment centers, educational institutions and health care facilities. They are the most heavily used bus routes and in many cases require additional trips during peak commute periods.
- Express routes (numbered 200 to 299 and 700 to 799) provide high speed point-to-point service along freeways and HOV facilities providing commuter period transportation to employment centers. Relatively few stops are made and service is generally designed to match typical work-time spreads. OCTA's 200-

series express routes operate within Orange County while the 700-series services connect Orange County with neighboring counties.

- Community routes (numbered 100 to 199) are typically shorter distance services that may act as community circulators and/or links to areas inaccessible by larger, standard size buses. They often provide connections to the local and express bus network. Community routes typically operate throughout the service day.
- Limited-stop/BRT routes (numbered 500 to 599) work with local routes and provide higher speed trips over major arterials. The speed advantage is realized by making fewer stops which are spaced about ¾-mile to 1 mile apart. Local bus riders making longer distance trips are among the transit users that are attracted to limited-stop/BRT service. Like local and community routes, these services operate throughout the service day.
- Rail feeder routes (numbered 400 to 499) provide access to and from employment centers for commuters using Metrolink commuter rail service. Feeder trips are scheduled to match specific train trips and, like express routes, operate only during commute hours.
- Shuttle routes (numbered 600 to 699) serve special event venues or provide additional connections to community points of interest as a traffic mitigation tool. Shuttle routes may be point-to-point and seasonal in nature such as OCTA's Orange County Fair Express network or confined to a single community perhaps using a short distance circular route structure.

As of June 2013, OCTA's fixed route bus service has a total of 77 routes. The network is comprised of 40 local routes, 14 community routes, 10 express routes (five intra- and five inter-county routes), 12 rail feeder routes, and one limited-stop route.

Target Service Standards and Policies

OCTA target service standards direct the development, implementation, monitoring, and modification of OCTA bus services. These standards are intended to govern the planning and design of the service. As such, they depict a desirable state against which existing service is assessed. The standards currently in place were adopted by the OCTA Board of Directors in 2012 and are summarized in Figure 6.

The current (June 2013) adherence to these standards is detailed below:

Span of Service Standard Compliance

Service	Yes	No	Partial
Local Routes	27	8	5
Bus Rapid Transit / Limited[1]	0	0	1
Community Routes	4	10	0
Express Routes	Based on Demand		
Rail Feeder Routes	Based on Demand		

[1] Bus Rapid Transit/Limited is in partial compliance with AM service starting at 5:00 AM. The standard is 5:30 AM to 8:30 PM, based on demand.

Productivity Standard Compliance

Service	Yes	No
Local Routes	22	18
Bus Rapid Transit / Limited	1	0
Community Routes	11	3
Express Routes	NA	
Rail Feeder Routes	NA	

Figure 6: System-Wide Bus Service Standards and Policies

TARGET SERVICE STANDARDS & POLICIES						
SPAN OF SERVICE:	LOCAL ROUTES (1-99 series)	BUS RAPID TRANSIT LIMITED (500-series)	COMMUNITY ROUTES (100-199 series)	EXPRESS ROUTES (200, 700-series)	RAIL FEEDER ROUTES (400-series)	SPECIAL EVENTS (600-series)
WEEKDAY:	5:30 A.M. - 8:30 P.M.	5:30 A.M. - 8:30 P.M. (1)	5:30 A.M. - 8:30 P.M. (1)	(1)	(1)	N/A
WEEKENDS & HOLIDAYS	7:00 A.M. - 7:00 P.M.	7:00 A.M. - 7:00 P.M.	7:00 A.M. - 7:00 P.M.	N/A	N/A	N/A
Span is defined as the first and last trips departing the terminal of origin.						
(1) Based on Demand						
PERFORMANCE STANDARDS:	LOCAL ROUTES (1-99 series)	BUS RAPID TRANSIT LIMITED (500-series)	COMMUNITY ROUTES (100-199 series)	EXPRESS ROUTES (200, 700-series)	RAIL FEEDER ROUTES (400-series)	SPECIAL EVENTS (600-series)
BOARDINGS/REVENUE VEHICLE HOUR:	30	25	10	N/A	N/A	N/A
SEAT OCCUPANCY ROUTE:	N/A	N/A	N/A	50%	N/A	N/A
Target service standards are work-toward goals and contigent on available funding						

Performance Standards and Policies

The section that follows describes OCTA's Performance Standards & Policies for vehicle load, vehicle headway, on-time performance, and service accessibility. These standards were adopted by the OCTA Board of Directors in 2012 and are summarized in Figure 7.

While service standards guide the delivery of service, performance measures evaluate the effectiveness of the service.

Performance Measure 1: Vehicle Headway

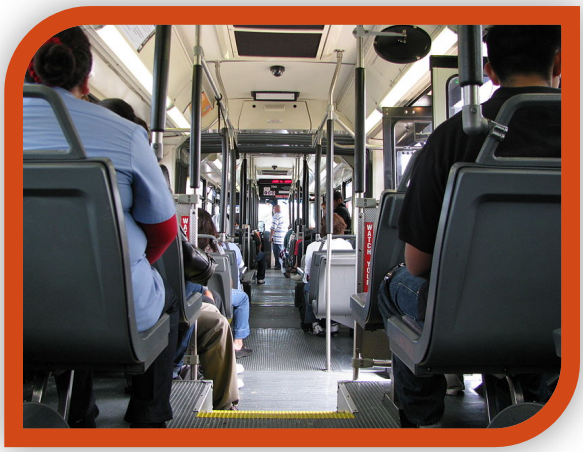
Vehicle Headway is the time interval between vehicles on a route that allows passengers to gauge how long they will have to wait for the next vehicle. Similar to vehicle load, vehicle headway varies by mode and time of day. Vehicle headway is primarily determined by bus ridership and is limited by the availability of resources to operate the system.

Vehicle Headway Standard Compliance

Service	Yes	No	Partial
Local Routes	17	16	7
Bus Rapid Transit / Limited	1	0	0
Community Routes	11	3	0
Express Routes	4	1	5
Rail Feeder Routes	12	0	0

Performance Measure 2: Vehicle Load

OCTA's Vehicle Load applies to the maximum number of passengers allowed on a service vehicle in order to ensure the safety and comfort of customers. The load standard is expressed as the ratio of passengers to the number of seats on the vehicle and it varies by mode and by time of day. OCTA passenger loads should not exceed 130 percent of seating capacity during any one-hour peak period on individual local fixed-routes or 100 percent on any express trip. OCTA regularly monitors the system to ensure appropriate allocation of trips on its lines. Lines with one or two trips experiencing overloading are usually addressed through additional trips. Lines with more than two trips experiencing overloading problems are analyzed for possible schedule change or increases in frequency.



Performance Measure 3: On-time Performance (OTP)

OCTA defines On-Time Performance as not more than five minutes late. On-Time Performance is measured at the time-point. A trip is on-time as long as it does not leave the time-point ahead of the scheduled departure time and no more than five minutes later than the scheduled departure time.

The On-Time Performance Service Standard is measured at the system line level of 85% of the actual departure times will meet the definition for being on-time. Exclusions from On-Time Performance are early departure times at time-points located within Free Running time route segments and Stationlink routes are measured for trips scheduled to arrive at Metrolink stations in the evening. System-wide On-Time Performance for FY11-12 was 85.6%.

Performance Measure 4: Service Accessibility

Service Accessibility is the percentage of population in proximity to bus service. Accessibility to OCTA service is defined as 90% of the population has access to a bus route within a one-quarter mile depending on the type of service. A review of service accessibility conducted in 2012 shows that 91.5% of Orange County jobs and residents are within ½ mile of on OCTA bus route.

Figure 7: Performance Standards and Policies

PERFORMANCE STANDARDS AND POLICIES

TIME PERIOD DEFINITIONS:

WEEKDAY PEAK PERIODS: 6 A.M. - 9 A.M. AND 3 P.M. - 6 P.M.
OFF-PEAK: WEEKDAYS OFF-PEAK ARE THE PERIODS PRECEDING OR FOLLOWING THE DEFINED A.M. AND P.M. PEAK PERIODS, AND ALL-DAY ON WEEKENDS. AND ALL-DAY ON WEEKENDS AND HOLIDAYS

HEADWAYS:

Policy: Service operates on Local Routes (1-99 series) and Bus Rapid Transit/Limited Stop Routes (500-series) every 30-minutes or better during weekdays and weekends.
Service operates on Community Routes (100-199 series) every 60-minutes or better during weekdays and weekends.
Service operates on Express Routes (200-series and 700-series), and Rail Feeder Routes (400-series) weekdays only with a minimum of two trips scheduled in the morning and afternoon commute periods.
Service operates on Special Event Routes (600-series) for a limited period of time with service scheduled to meet the needs of the event.

TARGET HEADWAY STANDARDS:	LOCAL ROUTES (1-99 series)	BUS RAPID TRANSIT LIMITED (500-series)	COMMUNITY ROUTES (100-199 series)	EXPRESS ROUTES (200, 700-series)	RAIL FEEDER ROUTES (400-series)	SPECIAL EVENTS (600-series)
PEAK WEEKDAY PERIOD (6-9 A.M., 3-6 P.M.):	30 MIN	30 MIN	60 MIN	(2)	(2)	N/A
OFF-PEAK/WEEKENDS:	30 MIN	30 MIN	60 MIN	N/A	N/A	N/A

(2) Minimum two one-way trips per peak weekday period.

LOADING STANDARDS:

Policy: The average of all loads during the weekday peak periods should not exceed achievable vehicle capacity which is 20 to 26 passengers for intermediate size buses; 44 to 49 passengers for low floor 40-foot buses; and 83 passengers for 60-foot buses.

Vehicle Type	Average Passenger Capacities				
	Seated	Standing	Total	Maximum Load Factor	Maximum Load Factor %
26' Cut-Away Bus	20	N/A	20	1.0	100%
31' Cut-Away Bus	26	N/A	26	1.0	100%
*40' Standard Bus**	34	10	44	1.3	130%
*40' Standard Bus**	36	10	46	1.3	130%
*40' Standard Bus**	37	11	48	1.3	130%
*40' Standard Bus**	38	11	49	1.3	130%
60' Articulated Bus	64	19	83	1.3	130%

**OCTA standard 40-foot buses vary in seats provided, from 34-seats on buses used for freeway express service to 38-seats on LNG buses.*

TARGET LOAD STANDARDS BY SERVICE TYPE:	LOCAL ROUTES (1-99 series)	BUS RAPID TRANSIT LIMITED (500-series)	COMMUNITY ROUTES (100-199 series)	EXPRESS ROUTES (200, 700-series)	RAIL FEEDER ROUTES (400-series)	SPECIAL EVENTS (600-series)
WEEKDAY PEAK PERIOD(% SEATS):	130% (3)	130% (3)	130% (3)	100%	130%	N/A
OFF-PEAK/WEEKEND (% SEATS):	100%	100%	100%	N/A	N/A	N/A

(3) 130% average during peak one hour in each peak period; maintain 125% average in remaining two hours in each peak

ON-TIME PERFORMANCE STANDARD:

Defined: Measured at the timepoint, a trip is on-time as long as it does not leave the timepoint ahead of the scheduled departure time, and no more than 5-minutes later than the scheduled departure time.

Standard: At the system level, 85% of the actual departure times will meet the definition for being On-Time. Change to 85% at the line level as reliable On-Time Performance measuring system becomes available.

Exclusions: Early departure times at timepoints located within Free Running time route segments will be considered to be On-Time. Stationlink routes OTP is measured for trips scheduled to arrive at Metrolink Stations in the P.M.

TARGET ACCESSIBILITY STANDARD:

% OF SERVICE AREA POPULATION & JOBS WITHIN 1/2 MILE OF A BUS ROUTE: 90% OR HIGHER

Coordination of Transit Service with Other Carriers

OCTA coordinates the delivery of transit services with several other transit agencies. They include Laguna Beach Transit, the City of Irvine, Riverside Transit Agency, Norwalk Transit System, Los Angeles County Metropolitan Transportation Authority, Long Beach Transit, North County Transit District, Omnitrans, Anaheim Resort Transit, various specialized charter bus services, and commuter rail services. Except for the City of Irvine and charter services, OCTA has interagency agreements with each of these agencies, which allow riders to transfer from one agency's services to another. However, Irvine does accept OCTA's pre-paid fare media on The ishuttle. In addition, OCTA coordinates schedules and bus stops with neighboring agencies and commuter rail service.

Commuter Rail Service

Metrolink is Southern California's commuter rail system that links residential communities to employment and activity centers. Metrolink is operated by the Southern California Regional Rail Authority (SCRRA), a joint powers authority of five member agencies representing the counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura.

Currently, Metrolink provides service on seven routes, covering 512 miles through six counties in Southern California. On an average weekday, there are 169 trains serving roughly 44,000 passenger trips at 55 stations. Orange County plays an important, and growing, role within this system.

As one of the five SCRRA member agencies, OCTA administers and funds Orange County's portion of the Metrolink commuter rail system. Orange County's share of Metrolink service covers 68 route miles and sees approximately 16,000 average weekday boardings, comprising more than 30 percent of Metrolink's total system-wide boardings. There are eleven stations in Orange County that serve a total of 54 round trips each weekday on three lines:

- **Orange County (OC) Line:** Daily service from Los Angeles Union Station to Oceanside;
- **Inland Empire-Orange County (IEOC) Line:** Daily service from San Bernardino and Riverside through Orange to Oceanside; and

- **91 Line:** Daily service from Riverside through Fullerton to Los Angeles Union Station.

In 2006, Metrolink Weekends service was introduced on the OC and IEOC Lines, with increased service during the summer travel season. In 2011, the summer service levels were implemented year-round, providing eight trains on the OC Line and four trains on the IEOC lines. Weekend ridership varies considerably dependent upon the season and local events, but generally the OC and IEOC Lines carry a total of approximately 20,000 weekend riders per month.

OCTA and other local agencies provide free transfers to local bus service to deliver Metrolink passengers to their final destinations. OCTA has 12 dedicated StationLink bus routes that connect with Orange County Metrolink stations in Anaheim Canyon, Anaheim, Orange, Santa Ana, Tustin, Irvine and Laguna Niguel/Mission Viejo. In Irvine, the iShuttle has four routes that provide peak hour connections to and from the Tustin and Irvine stations. Anaheim Resort Transportation also provides transfers at the Anaheim station. These local transit connections offer Metrolink ticket holders easy connections between stations and major employment and activity centers, with schedules designed to meet Metrolink weekday train arrivals and departures.

Future Transit Improvements

OCTA's 2010 Long-Range Transportation Plan (LRTP) outlines a vision for multi-modal transportation improvements throughout Orange County. OCTA is continuing to work towards implementing all of the components presented in the LRTP, although delivery timelines will likely need adjustments due to current economic conditions.

The components of the Preferred Plan, as presented in the 2010 LRTP, include transit improvements such as: (1) implementing bus rapid transit service on three high-demand corridors, (2) expanding the level of Metrolink commuter rail service to Los Angeles, (3) improving local connections to and from Metrolink stations, (4) expanding community shuttles, and (5) connecting Metrolink service to new regional transportation systems and centers.

OCTA is completing the 2013 Short-Range Transit Plan (SRTP), which will direct fixed-route transit improvements if additional resources become available. Any additional

revenue service hours will be split between schedule maintenance and new service. The SRTP outlines the criteria for which routes will receive additional service and corridors for new service in the next five years.

Commuter Rail Service Improvements

Metrolink commuter rail service in Orange County will be enhanced through OCTA's Metrolink Service Expansion Program (MSEP). SCRRA and OCTA staff have developed an implementation plan to provide higher-frequency Metrolink service on the OC Line between the Laguna Niguel/Mission Viejo station and the Fullerton Transportation Center. The increased Orange County Metrolink service provides additional passenger capacity as well as new off-peak trips, making Metrolink a more convenient travel alternative.

The MSEP also included significant track and switch improvements, railroad signal and communication upgrades, station and platform improvements, including added parking capacity, and safety enhancements, and a countywide grade crossing safety project, which are all now complete. OCTA is also working to design and construct a new Metrolink station in the City of Placentia. These improvements will be needed to accommodate the expected growth in ridership that will come with the service expansion. Funding for the MSEP is being provided though Measure M, Orange County's half-cent sales tax for transportation improvements.

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Chapter 4: Transportation Demand Management

Transportation Demand Management (TDM) strategies are geared toward increasing vehicle occupancy, promoting the use of alternative modes, reducing the number of automobile trips, decreasing overall trip lengths, and improving air quality. The adoption of a TDM ordinance was required of every local jurisdiction for Orange County's 1991 Congestion Management Program (CMP). The adoption of these ordinances is no longer a statutory requirement, however OCTA continues to encourage local jurisdictions to maintain these ordinances as a means of reducing greenhouse gas emissions.

TDM Ordinances

The model TDM ordinance, prepared by OCTA, promotes carpools, vanpools, alternate work hours, park and ride facilities, telecommuting, and other traffic reduction strategies. OCTA updated the model ordinance in 2001 to reflect the adoption of Rule 2202 by the South Coast Air Quality Management District (SCAQMD), which requires employers with 250 or more employees at a worksite to develop an emission reduction program to help meet an emission reduction target set by the SCAQMD.

Principal provisions of the TDM model ordinance are as follows:

- Applies to non-residential public and private development proposals expected to generate more than 250 employees;
- Contains a methodology for determining projected employment for specified land use proposals;
- Includes mandatory facility-based development standards (conditions of approval) that apply to proposals that exceed the established employment threshold;
- Presents optional provisions for implementing operational TDM programs and strategies that target the property owner or employer, and requires annual reporting on the effectiveness of programs and strategies proposed for facilities;

- Contains implementation and monitoring provisions; and
- Includes enforcement and penalty provisions.

Several jurisdictions have adopted ordinances that go beyond those contained in the model TDM ordinance. Such strategies include:

- Encouraging employers to establish and help subsidize telecommuting, provide monetary incentives for ridesharing, and implement alternative work hour programs;
- Proposing that new development projects establish and/or participate in Transportation Management Associations (TMAs);
- Implementing bus loading facilities at worksites;
- Implementing pedestrian facilities such as sidewalks, paved pathways, and pedestrian grade separations over arterial streets to connect worksites to shopping, eating, recreation, parking, or transit facilities; and
- Participating in the development of remote parking facilities and the high-occupancy vehicles (i.e., shuttles, etc.) to serve them.

Additional TDM Programs

TDM efforts in Orange County are not just limited to the implementation of the TDM ordinance provisions. Other TDM efforts, as described below, are also active throughout the County.

Freeway Construction Mitigation

OCTA and Caltrans developed a comprehensive public outreach program for commuters impacted by construction projects and improvements on Orange County freeways. The outreach program alleviates traffic congestion during freeway construction by providing up-to-date ramp, lane, and bridge closure information; as well as suggestions for alternate routes and travel modes.

Outreach efforts include public workshops, open houses, fast fax construction alerts, flyers and newsletters, as well as other materials and presentation events. Also, OCTA's website (www.octa.net), and the Orange County Freeway Construction Helpline (1-800 724-0353), make detour and closure information available. In addition, most

jurisdictions implement traffic management plans to alleviate roadway congestion during construction

Transit/Shuttle Services

Local fixed-route bus service comprises the largest portion of OCTA's transit services. In addition, OCTA provides fixed-route bus service to commuter rail (Metrolink) stations. Express bus service provides patrons with longer routes that utilize freeways to connect residential areas to Orange County's main employment centers. Furthermore, ACCESS provides elderly and disabled residents with a convenient paratransit service for daily commutes.

Transportation Management Associations

Transportation Management Associations (TMAs) are comprised of groups of employers who work together to solve mutual transportation problems by implementing programs to increase average vehicle ridership. Presently, Orange County has TMAs located in the following areas:

- Irvine (Irvine Spectrum TMA)
- Anaheim (Anaheim Transportation Network)

Park-and-Ride Lots

Currently there are 30 park-and-ride lots in Orange County providing about 6,800 parking spaces. Of the 30 lots, 11 are located at Metrolink stations, accounting for about 4,500 of the parking spaces. Also, four of the lots are located at OCTA transit centers, which account for another 1,180 parking spaces.

Park-and-ride lots serve as transfer points for commuters to change from one mode of travel (usually single-occupancy automobile) to another, higher capacity mode (bus, train, carpool, or vanpool). Providing a convenient system of park-and-ride transfer points throughout Orange County encourages ridesharing and the use of higher capacity transit systems, which improves the efficiency of the transportation system. Park-and-ride lots are also a natural companion to Orange County's network of High Occupancy Vehicle (HOV) lanes and transitways on the freeways.

Parking Cash-Out Programs

Parking cash-out programs are employer-funded programs that provide cash incentives to employees who do not drive to work. The most effective programs provide an incentive equal to the full cost of employee parking.

Bicycle and Pedestrian Facilities

Between 1990 and 2013, OCTA allocated more than $65 million for bicycle and pedestrian facility projects. Beginning in December of 2012, the OCTA Board has approved the use of a set aside of 10% of the OCTA's annual apportionment of Federal Congestion Mitigation and Air Quality (CMAQ) funds for bicycle and pedestrian projects. OCTA allocates this funding to Orange County local agencies through a Bicycle Corridor Improvement Program (BCIP) call for projects. The BCIP will be augmented with additional eligible federal or state fund sources should they become available.

Currently, the 2013 Federal Transportation Improvement Program has approximately $9.4 million programmed for bicycle facility projects in Orange County from the BCIP. In an effort to encourage this type of investment, OCTA developed a Commuter Bikeways Strategic Plan (CBSP), with Orange County agencies and groups, which provides local jurisdictions with guidance on regional bikeway priorities. The primary focus of the CBSP is to improve the viability of bicycle transportation and improve connectivity to major employment centers, transportation centers, schools, and universities.

OCTA updated the CBSP in 2009 to ensure consistency with the requirements of California Streets and Highways Code 891.2. Local jurisdictions may choose to adopt the 2009 CBSP as their own bicycle transportation plan, which will allow them to apply for the State Bicycle Transportation Account funds.

In 1995, OCTA launched a successful demonstration project to install bicycle racks on buses along four routes that served work sites, schools, shopping malls, and the beach. The success of the demonstration program led to a decision to equip all large buses in the OCTA fleet with bicycle racks. OCTA completed this program in June 1998. Bicycle racks are also provided on Metrolink trains; and bicycle lockers are available at Metrolink stations in Fullerton, Tustin, Santa Ana, and Orange, as well as at OCTA-owned park-and-ride lots.

OCTA is also currently engaging local jurisdictions in a collaborative effort to identify and create regional bikeway corridors. Initiated in the 4th Supervisorial District, the regional bikeways initiative is intended to be replicated in other districts throughout Orange County. Furthermore, OCTA was recently awarded grant funding to study non-motorized access at Orange County Metrolink stations. The results of this study will identify opportunity areas for non-motorized improvements that may include bike stations, bikesharing, new bikeways & crosswalks, etc.

During summer 2013, OCTA will be introducing Bike Link, our bike sharing pilot program in the city of Fullerton. The two-year program will ultimately have 15 stations conveniently located throughout the city including the main station at the Fullerton Train Station.

Guaranteed Ride Home Program

Employers throughout Orange County have the option to participate in OCTA's Guaranteed Ride Home Program. This program provides reliability for those who rideshare but are faced with an unexpected illness, at-home emergency, or unexpected overtime.

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Chapter 5: Land Use Impact Analysis

The Congestion Management Program (CMP) Traffic Impact Analysis (TIA) measures impacts of proposed development project on the CMP Highway System (CMPHS). Each jurisdiction in Orange County was allowed to select either the process outlined in the CMP TIA guidelines (Appendix B-1), or their existing traffic-environmental analysis process, as long as consistency is maintained with the CMP TIA guidelines.

Since 1994, the selected TIA process has been consistently applied to all development projects meeting the adopted trip generation thresholds (i.e., 2,400 or more daily trips for projects adjacent to the CMPHS, and 1,600 or more daily trips for projects that directly access the CMPHS).

OCTA allowed exemptions from this requirement for selected categories of development projects, consistent with State legislation (Appendix B-2 for a listing of exempt projects). Each of the traffic impact analyses conducted focused on:

- Identifying locations where, and the extent to which, trips generated by the proposed project caused CMPHS intersections to exceed their Level of Service (LOS) standards;
- Assessing feasible mitigation strategies capable of reducing the identified impact, thereby maintaining the LOS standard; and,
- Utilizing existing environmental processes and inter jurisdictional forums to conduct cooperative, inter jurisdictional discussion when proposed CMP mitigation strategies included modifications to roadway networks beyond the jurisdiction's boundaries; and/or, when a proposed development was identified that will increase traffic at CMPHS locations outside the jurisdiction's boundaries.

The biennial reporting process enables jurisdictions to report any locations where projected measurements would not meet the CMPHS LOS standards; as well as to discuss the projected impacts from development projects undergoing CMP traffic impact analyses. All jurisdictions in Orange County comply with the CMP land use coordination requirement.

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Chapter 6: Capital Improvement Program

The Capital Improvement Program (CIP) is a seven-year program of projects and programs that is adopted by each Orange County jurisdiction and integrated into a countywide CIP by the OCTA. It includes projects that will help to maintain or improve traffic conditions on the Congestion Management Program Highway System (CMPHS) and adjacent facilities. In addition to traditional capital projects, which preserve investments in existing facilities, the CIP can include projects that increase the capacity of the multi-modal system and provide air quality benefits, such as transit projects. Consistency with statewide standards is emphasized in order for projects in the CIP to compete for State funding.

The CIP projects, prepared by local jurisdictions for inclusion in the Orange County CMP, mitigate transportation impacts identified in the Land Use Impact Analysis component of the CMP, and preserve and maintain CMPHS infrastructure. Many types of CIP projects have been submitted by local jurisdictions in the past, including freeway ramp widenings, transportation systems management projects such as bus turnouts, intersection improvements, roadway widenings, signal coordination projects, and roadway resurfacing projects.

Each Orange County jurisdiction's CIP is included in Appendix E, which is published separately. All projects in the CIP that are State or federally funded, or locally funded but of regional significance, are included in the Orange County portion of the Federal Transportation Improvement Program (FTIP), and are consistent with the Regional Transportation Plan (RTP), both of which are approved by SCAG.

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Chapter 7: CMP Conformance

As Orange County's Congestion Management Agency, the Orange County Transportation Authority (OCTA) is legislatively required to monitor the implementation of all elements of the Congestion Management Program (CMP), and biennially determine conformance. In so doing, OCTA consults with local jurisdictions.

OCTA determines if the local jurisdictions are in conformance with the CMP by monitoring the following:

- Consistency with level of service standards;
- Adoption of Capital Improvement Programs;
- Adoption and implementation of a program to analyze the impacts of land use decisions, including an estimate of the costs associated with mitigating those impacts; and
- Adoption and implementation of deficiency plans when highway and roadway level of service standards are not maintained.

OCTA gathers local traffic data to determine the levels of service (LOS) at intersections throughout the CMP Highway System (CMPHS), as discussed in Chapter 2. In addition, the local jurisdictions complete a set of checklists, developed by OCTA, that guide them through the CMP conformity process (Appendix D). The checklists address the legislative requirements of the CMP, including land use coordination, the Capital Improvement Program, and transportation demand management strategies.

Based on the LOS data and CMP checklists completed by the local jurisdictions, as summarized in Figure 8, the following was determined for the 2013 CMP Update:

Level of Service

The LOS data, collected by OCTA, was provided to local jurisdictions for verification. A few discrepancies in LOS reporting occurred as a result of slight variations in the data collection methodology used by the cities and OCTA, or due to erroneously reported

intersection geometry. Any discrepancies in the LOS reporting were resolved through an interactive, cooperative process between the cities and OCTA. The data shows that all local jurisdictions are in compliance with the established LOS standards.

Capital Improvement Program

All local jurisdictions submitted adopted seven-year capital improvement programs that included projects to maintain or improve the traffic LOS on the CMPHS or adjacent facilities, which benefit the CMPHS.

Land Use Coordination

All local jurisdictions have adopted CMP Traffic Impact Analysis (TIA) processes for analyzing the impacts of land use decisions on the CMP Highway System. All local jurisdictions have applied their TIA processes to development projects that met the CMP minimum threshold of 2,400 or more daily trips (1,600 or more trips per day for development projects that will directly access the CMPHS).

Deficiency Plans

Based on the data exhibited in Figure 8, all non-exempt intersections on the CMP highway system were found in compliance with LOS requirements. Therefore, no deficiency plans were required for the 2013 CMP.

OCTA Transit Performance Measures

OCTA has an established set of performance measures and standards used to monitor transit services. Moreover, in 2007, OCTA agreed to cooperative procedures for carrying out regional transit planning and programming by signing a memorandum of understanding with SCAG.

Regional Consistency

To ensure consistency between CMPs within the SCAG region, OCTA submits each biennial update of the Orange County CMP to SCAG. As the regional agency, SCAG evaluates consistency with the Regional Transportation Plan and with the CMPs of adjoining counties, and incorporates the program into the Federal Transportation Improvement Program (FTIP), once consistency is determined.

FIGURE 8: Summary of Compliance

Jurisdiction	Capital Improvement Program	Deficiency Plan	Land Use	Level of Service	2013 Compliance
Aliso Viejo *	Yes	N/A	Yes	N/A	Yes
Anaheim	Yes	N/A	Yes	Yes	Yes
Brea	Yes	N/A	Yes	Yes	Yes
Buena Park	Yes	N/A	Yes	Yes	Yes
Costa Mesa	Yes	N/A	Yes	Yes	Yes
Cypress	Yes	N/A	Yes	Yes	Yes
Dana Point	Yes	N/A	Yes	Yes	Yes
Fountain Valley *	Yes	N/A	Yes	N/A	Yes
Fullerton	Yes	N/A	Yes	Yes	Yes
Garden Grove	Yes	N/A	Yes	Yes	Yes
Huntington Beach	Yes	N/A	Yes	Yes	Yes
Irvine	Yes	N/A	Yes	Yes	Yes
La Habra	Yes	N/A	Yes	Yes	Yes
La Palma*	Yes	N/A	Yes	N/A	Yes
Laguna Beach	Yes	N/A	Yes	Yes	Yes
Laguna Hills	Yes	N/A	Yes	Yes	Yes
Laguna Niguel	Yes	N/A	Yes	Yes	Yes
Laguna Woods	Yes	N/A	Yes	Yes	Yes
Lake Forest	Yes	N/A	Yes	Yes	Yes
Los Alamitos	Yes	N/A	Yes	Yes	Yes
Mission Viejo	Yes	N/A	Yes	Yes	Yes
Newport Beach	Yes	N/A	Yes	Yes	Yes
Orange	Yes	N/A	Yes	Yes	Yes
Placentia	Yes	N/A	Yes	Yes	Yes
Rancho Santa Margarita *	Yes	N/A	Yes	N/A	Yes
San Clemente *	Yes	N/A	Yes	N/A	Yes
San Juan Capistrano	Yes	N/A	Yes	Yes	Yes
Santa Ana	Yes	N/A	Yes	Yes	Yes
Seal Beach *	Yes	N/A	Yes	N/A	Yes
Stanton	Yes	N/A	Yes	Yes	Yes
Tustin	Yes	N/A	Yes	Yes	Yes
Villa Park *	Yes	N/A	Yes	N/A	Yes
Westminster	Yes	N/A	Yes	Yes	Yes
Yorba Linda *	Yes	N/A	Yes	N/A	Yes
County *	Yes	N/A	Yes	Yes	Yes

*No CMP intersections within jurisdiction

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Appendix A: Freeway Level of Service

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To Be Provided by Caltrans

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Appendix B-1: Meeting CMP Traffic Impact Analysis Requirements

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Meeting CMP Traffic Impact Analysis Requirements

AN OPTIONAL GUIDANCE FOR LOCAL JURISDICTIONS

Prepared for:

Orange County Environmental Management Agency
Orange County Transportation Commission
Orange County Transit District
League of Cities, Orange County Division
Transportation Corridor Agencies

Prepared by:

Kimley-Horn and Associates, Inc.
and
The Planning Center

June 11, 1991

CMP-TIA REQUIREMENTS

Requirements of CMP legislation

- Analyze impacts of land use decisions on CMP Highway System.
- Estimate costs associated with mitigation of impacts on CMP Highway System.
- Exclude costs associated with mitigating the impacts of interregional travel.
- Allow credits against mitigation costs for local public and private contributions to improvements to the CMP Highway System.
  - For toll road facilities, allow credits only for local public and private contributions which will not be reimbursed from toll revenues or other state or federal sources.
- Report annually on actions taken to adopt and implement a program to analyze the impacts of land use decisions on the CMP Highway System and to estimate the costs of mitigating those impacts.

Year One Goal

- Identify the impacts of development anticipated to occur over the next 7 years on the CMP Highway System and the projected costs of mitigating those impacts.

Actions Required of Local Jurisdictions

- A TIA will be required for CMP purposes for all proposed developments generating 2,400 or more daily trips. For developments which will directly access a CMP Highway System link, the threshold for requiring a TIA should be reduced to 1,600 or more trips per day.
- Document procedures used to identify and analyze traffic impacts of new development on CMP Highway System. This documentation should include the following:
  - Identification of type of development proposals which are subject to a traffic impact analyses (TIA);
  - Description of required or acceptable TIA methodology; and
  - Description of inter-jurisdictional coordination process used when impacts cross local agency boundaries.
- Document procedures/standards used to determine the costs of mitigation requirements for impacts of new development on CMP Highway System.
- Document methodology and procedures for determining applicable credits against mitigation costs including allowable credits associated with contributions to toll road facilities.

SECTION 1 – INTRODUCTION

Purpose

State legislation creating the Congestion Management Program (CMP) requires that the program contain a process to analyze the impacts of land use decisions by local governments on the regional transportation system. Once impacts of a land use decision are identified, the CMP also requires that the costs to mitigate the impacts be determined.

For CMP purposes, the regional transportation system is defined by the legislation as all state highways and principal arterials at a minimum. This system is referred to as the CMP Highway System. The identification and analysis of impacts along with estimated mitigation costs are determined with respect to this CMP Highway System.

The objectives of this report are to:

- Provide guidance to local agencies in conducting traffic impact analyses.
- Assist local agencies in maintaining eligibility for funds through documentation of CMP compliance.
- Make available minimum standards for jurisdictions wishing to use them for identifying and analyzing impacts on CMP Highway System.
- Establish CMP documentation requirements for those jurisdictions which elect to use their own TIA methodology.
- Establish a baseline from which TIA standardization may evolve as experience is gained in the CMP process.
- Cause the analysis of impacts on the CMP Highway System to be integrated into the local agency development review process.
- Provide a method for determining the costs associated with mitigating development impacts.
- Provide a framework for facilitating coordination between agencies when appropriate.

Background

Through a coordinated effort among local jurisdictions, public agencies, business and community groups, Orange County has developed a Congestion Management Program framework in response to the requirements of Assembly Bill 1791. This framework is contained in the Congestion Management Program Preparation Manual which was issued in January 1991 as a joint publication of the following agencies:

- County of Orange
- Orange County Division, League of California Cities
- Orange County Transportation Commission
- Orange County Transit District

- Transportation Corridor Agencies

The CMP Manual describes the CMP Program requirements for each component prescribed by the CMP provision of AB 1791. The components include one entitled Land Use Coordination, which sets forth the basic requirements for the assessment, mitigation, and monitoring of traffic impacts to the CMP Highway System which are attributable to development projects.

Consolidation of Remaining Issues

This report is intended to present a useful reference in addressing the remaining issues associated with the identification and treatment of development impacts on the CMP Highway System. It is desirable that a standardized approach be utilized for determining which projects require analysis and in carrying out the resulting traffic impact analysis (TIA). It is also desirable that a reasonably uniform approach be utilized in determining appropriate mitigation strategies and estimating the associated costs.

TIA Survey History

In 1989, Kimley-Horn and Associates, Inc. conducted a survey of TIA procedures being used at the time by local jurisdictions within Orange County. The survey revealed that although there were some commonalities, there was considerable variation in approach, scope, evaluation methodology, and project disposition.

As part of the CMP process, it was determined that the identification of TIA elements which can or should be standardized should be accomplished. Additional documentation of cost estimating practices and the development of standardized costs and estimating procedures will be valuable in achieving desired consistency among jurisdictions.

In order to accomplish these objectives, Kimley-Horn's previous TIA survey was updated and additional information was solicited from each local agency within Orange County. The information was obtained through telephone interviews with City Engineers and Planners after they had an opportunity to examine the survey questionnaire which was mailed to them in advance of the interview. The information obtained was used in preparing the methodology recommendations contained in this report. A summary of the update survey results is provided in the Appendix.

Relationships with Other Components

In addition to being an integral part of the Land Use Coordination component of the CMP, the traffic impact analysis requirements also relate to all other CMP components to a greater or lesser degree. These components include the following:

- Modeling
- Level of Service
- Transit Standards
- Traffic Demand Management
- Deficiency Plans

- Capital Improvement Program

The Land Use Coordination section in Chapter 3 of the CMP Preparation Manual dated January, 1991 contains a detailed description of each of the component linkages listed above.

SECTION 2- REQUIREMENTS OF CMP LEGISLATION

The complete text of CMP legislation is contained in Appendix A to the Preparation Manual for the Congestion Management Program for Orange County dated January, 1991. For ease of reference, the requirements of this legislation related to analysis of the impacts of land use decisions made by local jurisdictions are summarized as follows:

- Analyze impacts of land use decisions on CMP Highway System.
- Estimate costs associated with mitigation of impacts on CMP Highway System.
- Exclude costs associated with mitigating the impacts of interregional travel.
- Allow credits against mitigation costs for local public and private contributions to improvements to the CMP Highway System.
    - For toll road facilities, allow credits only for local public and private contributions which will not be reimbursed from toll revenues or other state or federal sources.
- Report annually on actions taken to adopt and implement a program to analyze the impacts of land use decisions on the CMP Highway System and to estimate the costs of mitigating those impacts.

SECTION 3 - ACTIONS REQUIRED OF LOCAL AGENCIES

The provisions of CMP legislation, as summarized in the preceding section, impose a requirement on local jurisdictions to carry out certain actions in order to demonstrate their compliance with the CMP program. This compliance will maintain eligibility to receive state gas tax funds made available by the voter approved Proposition 111. The actions and documentation requirements related to the identification and analysis of traffic impacts include the following:

- A TIA will be required for CMP purposes for all proposed developments generating 2,400 or more daily trips. For developments which will directly access a CMP Highway System link, the threshold for requiring a TIA should be reduced to 1,600 or more trips per day.
- Document procedures used to identify and analyze traffic impacts of new development on CMP Highway System. This documentation should include the following:
    - Identification of type of development proposals which are subject to a traffic impact analyses (TIA);

  - Description of required or acceptable TIA methodology; and
  - Description of inter-jurisdictional coordination process used when impacts cross local agency boundaries.

- Document procedures/standards used to determine the costs of mitigation requirements for impacts of new development on CMP Highway System.
- Document methodology and procedures for determining applicable credits against mitigation costs including allowable credits associated with contributions to toll road facilities.
- Establish annual monitoring and reporting process to summarize activities performed in analyzing the impacts of land use decisions on the CMP Highway System and in estimating the associated mitigation costs. Procedures for incorporating mitigation measures into the Capital Improvement Program should also-be established.
- For the first year, local jurisdictions may assume that all interregional travel occurs on the freeway system or they may develop an analysis methodology to determine the amount of interregional travel occurring on arterials which are part of the CMP Highway System. During the first year, TIAs need to analyze only the impacts to arterial portions of the CMP Highway System.

SECTION 4 - CMP TRAFFIC IMPACT ANALYSIS METHODOLOGY

In order to assure that the CMP Program meets its objectives of linking land use decisions with the adequate evaluation of impacts related to those decisions, traffic impact analyses must often be undertaken. There are a number of essential elements which should be included in traffic impact analyses (TIA) used to support the program. Many local jurisdictions already employ development review processes which will be adequate for addressing CMP requirements. For those jurisdictions wishing technical guidance in carrying out the analysis of traffic impacts on the CMP Highway System, this section offers an appropriate TIA methodology.

PROJECTS REQUIRING TIA ANALYSIS

All development in Orange County will use the CMP Network to a greater or lesser extent from time-to-time. The seven-year capital improvement program, together with deficiency plans to respond to deficiencies which cannot be resolved in the 7-year timeframe, are developed in response to anticipated growth in travel within a jurisdiction. Thus, a certain level of travel growth is addressed in the normal planning process and it is not necessary to evaluate relatively small projects with a TIA or to rely on TIA's as the primary means of identifying needed CMP Highway System improvements. Furthermore, County voters have approved a sales tax increase which will fund major improvements to the transit and highway systems serving the County.

Many jurisdictions will require an EIR for a proposed development project. When required, the EIR should include steps necessary to incorporate the required CMP analysis. Most or all of the TIA elements described in this section would normally be incorporated into the typical EIR traffic analysis.

Certain development projects not requiring an EIR should still be evaluated through a TIA process due to their land use type, intensity, proximity to the CMP network, and/or duration of development timeframe. In other words, developments which will significantly alter the anticipated demand on a CMP roadway should be evaluated through a TIA approach.

At the present time, there is a wide-ranging approach to determining which projects will require a TIA. In some jurisdictions, there are formal guidelines, while in others it depends primarily on the judgment of a member of staff relative to the probable significance of the project's impact on the surrounding road system.

The OCTC TIA guidelines recommended defining three percent of the level of service standard as significant impact. This seems reasonable for application for CMP purposes. Thus, project impacts of three percent or less can be mitigated by impact fees or other revenues. Projects with a potential to create an impact of more than three percent of Level of Service E capacity will require TIA's. On this basis, it is recommended that all development projects which generate more than 2,400 daily trips be subject to a TIA for CMP evaluation. For projects which will directly access or be in close proximity to a CMP Highway System link a reduced threshold of 1,600 trips/day would be appropriate. Appendix B provides background information of the derivation of these threshold values.

TIA PROCESS

There are a number of essential elements in the TIA process itself. It is desirable that all of these elements be evaluated within an acceptable range of criteria in order to assure the objectives of the CMP process and to maintain a reasonable degree of equity from jurisdiction to jurisdiction. It is recognized, however, that for certain of the elements, some variations relating to professional judgment and local criteria and characteristics are necessary and appropriate to the process. These factors have been fully considered in developing the descriptions of the following elements:

- Evaluation of existing conditions
- Trip generation
- Internal capture and passer-by traffic
- Trip distribution and assignment
- Radius of development influence
- Background traffic
- Capacity analysis methodology
- Impact costs/mitigation

Evaluation of Existing Conditions

In order to evaluate the relative impacts of a proposed development, determine CMP Highway System status and define appropriate mitigation for new impacts, it is necessary to understand the existing conditions on the affected roadway network. Evaluation of existing conditions is common to nearly all jurisdictions in Orange County. Given that most jurisdictions use link and intersection capacity analysis techniques compatible with the techniques identified in the level-of-service component, no changes in existing local jurisdiction procedures should be necessary in connection with the CMP Program.

Trip Generation

At the foundation of traffic impact analyses is the quantification of trip generation. Use of the ITE Trip Generation Manual is common throughout Orange County. In addition, other widely accepted practices are being used when appropriate to supplement the lit data. These practices include use of acceptable rates published by local agencies and surveys conducted at similar sites, subject to approval of the reviewing agency. Given the uniformity of practice in Orange County to date, no major adjustments in this procedure should be required. It would be desirable however to establish a central library for reporting the results of special trip generation studies and making these results available to all other jurisdictions who wish them.

Internal Capture and Passer-by Traffic

Techniques for identifying the internal relationship of travel within mixed-use developments and the degree to which development captures passer-by trips as opposed to creating new trips are being applied by approximately 2/3 of the local jurisdictions within Orange County. The use of guidelines in the ITE Trip Generation Manual and appropriate professional judgment are the predominant techniques employed. To supplement the guidance available through ITE documentation, local jurisdictions are encouraged to undertake additional studies to document rates applicable within their jurisdiction. The determination of applicable rates should be undertaken by experienced transportation engineering professionals with thorough documentation of the methodology, data, and assumptions used. It is recommended that those jurisdictions which do not currently allow these adjustments establish revised TIA procedures incorporating this element. As with trip generation data, a central library would be desirable for reporting of data and analyses performed locally related to determination of appropriate factors.

Trip Distribution and Assignment

Several appropriate distribution and assignment techniques are used in Orange County, depending on the size of the development and the duration of buildout. Manual and computer modeling approaches are used as appropriate. Manual methods based on the best socio-economic information available to the agency and applicant should be acceptable except when a development's size makes a modeling approach more appropriate. Sources of this information include demographic surveys, market analyses, and previous studies.

Radius of Development Influence

There are numerous ways to identify the study area to be evaluated in a TIA. These include both qualitative and quantitative approaches. One of the most effective ways is through the determination of the quantity of project traffic on CMP roadway links compared to a selected level of impact. The goal of a quantitative approach is to be sure that all elements of the CMP network are addressed in a comparable manner from jurisdiction to jurisdiction. This is important due to the potential for overlapping impacts among jurisdictions. It is also important to maintain flexibility within a quantitative process to allow transportation professionals at local jurisdictions to add areas to the study which are of specific concern. It is not intended that CMP practices should restrict this aspect of each agency's existing TIA process.

It is recommended that the study area for CMP Highway System links be defined by a measure of significant impact on the roadway links. As a starting point, it is proposed that the measure be three percent of existing roadway capacity. Thus, when a traffic impact analysis is being done it would require the inclusion of CMP roadway links that are impacted by 3 percent or more of their LOS E capacity. If a TIA is required only for CMP purposes, the study area would end when traffic falls below three percent of capacity on individual roadway links. If the TIA is also required for other purposes, additional analysis can be required by the local jurisdiction based on engineering judgment or local regulation as applicable.

Background Traffic

In order for a reasonable assessment of the level of service on the CMP network, it is necessary to not only identify the proposed development impact, but also the other traffic which can be expected to occur during the development of the project. There are numerous methods of evaluating background traffic. The implications of these alternative methods are that certain methodologies may result in deficiencies, while other methodologies may find an acceptable operating conditions.

The cost to mitigate impacts of a land use decision is unrelated to background traffic. Rather, it is related to the cost of replacing the capacity which is consumed by the proposed development. However, it is necessary to understand background traffic in order to evaluate level-of-service. Background traffic is composed of existing traffic demands and growth from new development which will occur over a specific period of time. Both the existing and the growth elements of background traffic contain sub-elements. These include traffic which is generated within Orange County, that which begins and/or ends within the County, and interregional traffic which has neither end in Orange County. CMP legislation stipulates that interregional traffic will not be considered in CMP evaluations with respect to LOS compliance or determining costs of mitigation.

Given that the CMP process is new, there is no existing practice of separating interregional traffic from locally generated traffic. Until a procedure for identifying interregional traffic is developed, local jurisdictions may assume that all interregional traffic occurs on the freeway system. Initially TIA's required for CMP purposes need only

analyze the impacts to arterial portions of the CMP Highway System.

Local governments in Orange County are generally consistent in their approach to background traffic. There are three major approaches used. The first is to use historical growth factors which are applied to existing traffic volumes to project future demands. The second is to aggregate the impacts of specific individual projects which have been approved or planned but not built to identify the total approved background traffic on the study area roadway system. A third method is to use computer modeling to identify total traffic demands which represent both background traffic and project impact traffic. For the present CMP program, it is recommended that the discretion for the appropriate process lie within the local jurisdiction, however, the method to be used in the jurisdiction should be clearly defined in the agency's TIA rules and procedures. In addition, it is recommended that all jurisdictions create a listing of approved development projects and a map showing their locations which would be updated frequently and be available to other jurisdictions on request. The listing should include information related to type and size of land use and phasing for each project.

It is appropriate to periodically update long range forecasts based on development approvals and anticipated development growth in the region and plan a transportation system which will provide the necessary level-of-service for this amount of development. When a development proposal will significantly alter this long-term plan, it will be necessary to address the aggregate of all approved development to assure that there is a long-term solution. However, from a TIA perspective, it is reasonable and practical to consider only that development traffic which can be expected to exist at the time of buildout of a new development proposal. That is to say, for CMP purposes background traffic should be limited to that traffic which is generated by development which will exist at the time of buildout of a proposed development. CEQA requirements may dictate that other background traffic scenarios be analyzed as well.

Capacity Analysis Methodology

Once the projected traffic demands are known, it is necessary to evaluate these demands relative to available and planned roadway capacity. The methodology used in capacity determination in Orange County is relatively uniform. Additionally, the level of service (LOS) component of the CMP Program has identified specific criteria which are to be used in determining level-of-service on the CMP Highway System.

Impact Costs/Mitigation

This element is at the heart of the CMP process; that is to identify the costs of mitigating a land development decision on the CMP System.

The current practice throughout Orange County is to require mitigation only when the level-of-service standard is exceeded. However, some jurisdictions require regular impact mitigation fees and phasing road improvements with development. The growth management requirement of the sales tax Measure M mandates a traffic phasing program. Often, mitigation is equated to construction of roadway improvements to maintain an acceptable level-of-service and/or to maintain the existing level-of-service. In some instances, a pay and go mitigation approach is allowed. This means that new

development may pay its fair share and go forward and the provision of improvements remain the responsibility for the local jurisdiction.

In order to assess responsibility for impacts, there are a variety of approaches. One approach is to consider impact traffic as a percent of total traffic. Impact traffic may also be taken as a percentage of existing capacity. Another common approach is to use the net impact of development as a percent of total future traffic demand.

Since CMP legislation requires the identification of costs of land use decisions and impacts across jurisdictional lines, it is desirable that the CMP program have a consistent method for identifying the costs of development impacts. On the other hand, a wide variety of mitigations can occur from jurisdiction to jurisdiction.

It is recommended that the impact costs be calculated as the total of new development traffic on a roadway link requiring improvement divided by the capacity of the improvement times the cost of the improvement. This can be expressed in a formula as follows:

$$\textbf{Impact Cost} = \frac{\text{Development Traffic}}{\text{Capacity of Improvement}} \times \text{Improvement Cost}$$

Improvements to be included in the cost analysis should be those identified in the jurisdiction's adopted Circulation Element and any additional improvements identified in the development TIA. The total impact cost for a development would be the sum of costs for all significantly impacted links. Funds collected from these assessments could be aggregated and applied to specific projects on an annual basis in accordance with locally established priorities. If project impacts extend across jurisdictional boundaries the impact costs calculated for significantly impacted links in an adjacent jurisdiction should be allocated to that jurisdiction for use in its program of prioritized improvements.

Through this process, progress can be achieved in implementing system improvements without having to wait for 100% of the funds being collected for each individual improvement. In theory, all required improvements will be accomplished over time as new developments are approved which will generate traffic to utilize available and planned system capacity. The costs should be based on recent Unit cost experience in Orange County and may include planning, permitting, preliminary engineering, design, right-of-way, construction, landscaping, construction inspection, and, if applicable, financing costs.

There are two approaches to mitigation. One is traffic reduction and the other is to build improvements to accommodate the new traffic. Traffic reduction through transportation demand ordinances or other regulations which will reduce impacts can be calculated in the same way a development impact would be calculated. But in this case, it would be taken as a credit or a reduction in impact. Mitigation techniques such as TDM or phasing or reduction in project intensity merely reduce for a new development the amount of impact which must be mitigated and are changes which should occur prior to the calculation of project impact costs. A monitoring program

should be established to confirm that anticipated reductions are realized.

To comply with the CMP process, a local jurisdiction should accomplish two things. First, it should demonstrate that it is analyzing and mitigating the impact of new development on the CMP Highway System. Second, it should maintain the level-of-service standards or adopt a deficiency plan Consistent with CMP legislation. In order to demonstrate the mitigation which has been undertaken, the local jurisdiction should maintain a record of the cumulative impact cost of all development approvals and the cumulative mitigation value of improvements provided by the local jurisdiction. These could be construction programs or credits from a TDM ordinance or other traffic reduction measures. It is then only necessary to show on an annual basis that the total improvement costs plus traffic reduction credits are equal to or greater than the total impact cost of new development approvals to prove mitigation compliance.

The maintenance of level-of-service would come through implementation of improvements contained in the 7-year capital improvements element, Measure M and state-funded improvements, additional improvements which may be made in conjunction with development approvals, and from deficiency plans which may be required from time to time. From a TIA perspective, it would be necessary to document the following:

a. the level-of-service on the CMP network at buildout of the proposed development will be: 1) level—of-service "E or better, or 2) will not result in a cumulative increase of more than 0.10 in v/c ratio if the established LOS standard is worse than LOS E.

b. a deficiency plan exists to address the links for which level-of-service is not provided, and

c. a deficiency plan will be developed for a new link when a deficiency will occur.

DOCUMENTATION OF RULES AND PROCEDURES

To assure a clear understanding of the TIA procedures which are necessary to support a viable CMP program, it is recommended that a set of rules and procedures be established by each local jurisdiction. Ideally, these rules and procedures would cover the requirements for the full TIA analysis and would include minimum requirements for the CMP process. Local jurisdictions which prefer not to adopt separate CMP TIA standards could implement standards for CMP requirements within a TIA and maintain their existing approach for all other aspects of their existing TIA process. The following is a summary of the elements which should be included in CMP procedures documentation and the methodologies applicable to each element:

1. **Thresholds for Requiring a TIA for CMP** - Projects with the potential to create an impact of more than 3% of LOS "E' capacity on CMP Highway system links should require a TIA. All projects generating 2,400 or more daily trips should require a TM for CMP evaluation. If a project will have direct access to a CMP link this threshold should be reduced to 1,600 or more daily trips. A TIA should not be required again if one has already been performed for the project as part of an earlier development approval which takes the impact on the CMP Highway System into account.
2. **Existing Conditions Evaluation** - Identify current level-of-service on CMP roadways and intersections where the proposed development traffic will contribute to 3 percent of the existing capacity. Use procedures defined in the level-of-service component for evaluation of level—of-service.
3. **Trip Generation** - ITE trip generation rates or studies from other agencies and locally approved studies for specific land uses.
4. **Internal Capture and Passerby Traffic** - Justification for internal capture should be included in the discussion. Passerby traffic should be calculated based upon ITE data or approved special studies.
5. **Distribution and Assignment** - Basis for trip distribution should be discussed and should be linked to demographic or market data in the area. Quantitative and/or qualitative information can be used depending on the size of the proposed development. As the size of the project increases, there should be a tendency to use a detailed quantitative approach for trip distribution. Trip assignment should be based on existing and projected travel patterns and the future roadway network and its travel time characteristics.
6. **Radius of Impact/Project Influence** - The analysis should identify the traffic assignment on all CMP roadway links until the impact becomes less than 3 percent of level of service E capacity.
7. **Background Traffic** - Total traffic which is expected to occur at buildout of the proposed development should be identified.
8. **Impact Assessment Period** - This should be the buildout timeframe of the proposed development.
9. **Capacity Analysis Methodology**- The methodology should be consistent with that specified in the level-of—service component of the CMP Program.
10. **Improvement Costs** - The cost of roadway improvements should include all costs of implementation including studies, design, right-of-way, construction, construction inspection, and financing costs, if applicable.
11. **Impact Costs and Mitigation** - The project impact divided by the capacity of a roadway improvement times the cost of the improvement should be identified for each significantly impacted CMP link and summed for the study area.

12. **Projected Level-of-Service** - The TIA should document that the projected level-of-service on all CMP links in the study area will be at Level-of-Service "E" or the existing level-of-service whichever is less, or that a deficiency plan exists or will be developed to address specific links or intersections.

SECTION 5 – APPENDICES

Appendix A – Summary of TIA Update Survey Results (Available Upon Request)

Appendix B – Deviation of Thresholds for Projects Requiring TIA Analysis

APPENDIX B

DERIVATION OF THRESHOLDS FOR PROJECTS REQUIRING TRAFFIC IMPACT ANALYSIS

The TIA process recommendation is to require a TIA for any project generating 2,400 or more daily trips. This number is based on the desire to analyze any impacts which will be 3% or more of the existing capacity. Since most CMP Highway System will be four lanes or more, the capacity used to derive the threshold is a generalized capacity of 40,000 vehicles/day. The calculations are as follows:

40,000 veh./day x 3% = 1,200 veh./day

Assuming 50/50 distribution of project traffic on a CMP link

1,200 x 2 = 2,400 veh./day total generation

As can be seen, a project which will generate 2,400 trips/day will have an expected maximum link impact on the CMP system of 1,200 trips/day based on a reasonably balanced distribution of project traffic. On a peak-hour basis, the 3% level of impact would be 120 peak-hour trips. For intersections, a 3% level of impact applied to the sum of critical volume (1,700 veh./hr.) would be 51 vehicles per hour.

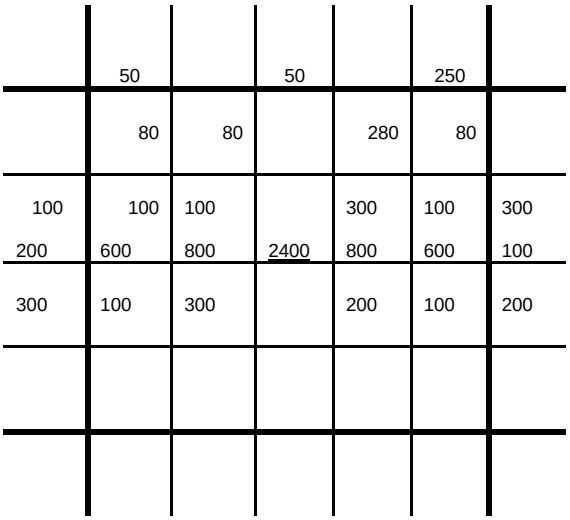
A level of impact below 3% is not recommended because it sets thresholds which are generally too sensitive for the planning and analytical tools available. Minor changes in project assumptions can significantly alter the results of the analysis and the end result can be additional unnecessary cost to the developer and additional review time by staff with little benefit. Additionally, a lower threshold of significance will expand the study area, which also increases effort and costs, and increases the probability that the analysis would extend beyond jurisdictional boundaries.

The following illustration shows that the 2,400 trip/day threshold would be expected to produce a 3% impact on the CMP System only when the project has relatively direct access to a CMP link. As a project location moves further off the CMP System the expected impacts is reduced. With a more directional distribution of project traffic a development with direct CMP System access cold produce a 3% impact with somewhat lower daily trip generation.

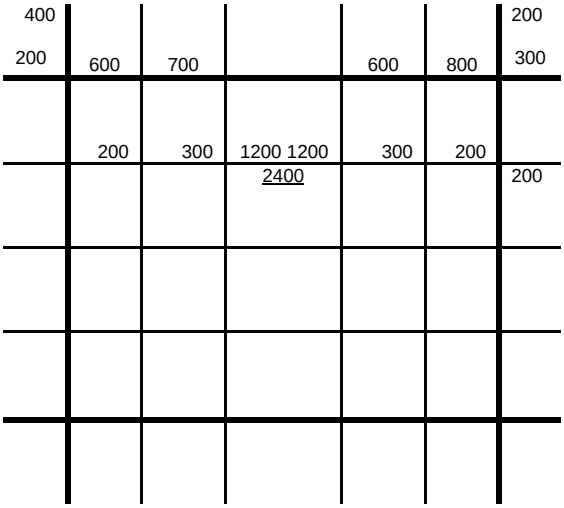
The table included on the following page illustrates the daily trip generation thresholds which would produce various levels of impact on the CMP System for project locations with and without direct access to the system. Based on a 3% impact the trip generation thresholds for requiring a TIA are 1,600 veh./day with direct CMP System access and 2,400 veh./day if a project does not have direct CMP System access.

CMP Highway System Impacts for Development Generating 2,400 trips/day

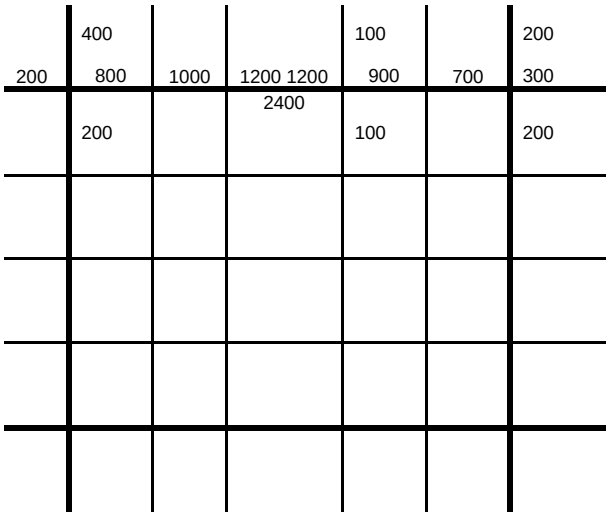
Based on proximity to CMP System



MAXIMUM IMPACT < 1%



MAXIMUM = 1.8%



MAXIMUM = 3%
COULD BE 4.5% WITH 75/25 SPLIT

Alternative Criteria

Assume 75/25 distribution

For direct access to CMP System:
1,200/.75 = 1,600 veh./day

For no direct CMP System Access:
Approximately 1/3 less impact on CMP System
1,600 x 3/2 = 2,400 veh./day

Daily Trip Generation

Significant Impact	Direct Access	No Direct Access
1%	500	800
2%	1,100	1,600
3%	1,600	2,400

Appendix B-2: Traffic Impact Analysis Exempt Projects

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Appendix B-2: Traffic Impact Analysis Exempt Projects

Projects exempt from the requirements of a mandatory, CMP Traffic Impact Analysis are listed below. This list is not meant to be all-inclusive. Any inquiries regarding additional exemptions shall be transmitted in writing to the Orange County Transportation Authority, attention CMP Program Manager.

Project Not Requiring a CMP TIA Analysis:

1. Applicants for subsequent development permits (i.e., conditional use permits, subdivision maps, site plans, etc.) for entitlement specified in and granted in a development agreement entered into prior to July 10, 1989.[1]
2. Any development application generating vehicular trips below the Average Daily Trip (ADT) threshold for CMP Traffic Impact Analysis, specifically, any project generating less than 2,400 ADT total, or any project generating less than 1,600 ADT directly onto the CMPHS. [1, 2]
3. Final tract and parcel maps. [1, 2, 3]
4. Issuance of building permits. [1, 2, 3]
5. Issuance of certificates of use and occupancy. [1, 2, 3]
6. Minor modifications to approved developments where the location and intensity of project uses have been approved through previous and separate local government actions prior to January 1, 1992. [1, 2, 3]

[1] Vehicular trips generated by CMP TIA-exempt development applications shall not be factored out in any traffic analyses or levels of service calculations for the CMPHS.

[2] Exemption from conduction a CMP TIA shall not be considered an exemption from such projects' participation in approved, transportation fee programs established by the local jurisdiction.

[3] A CMP TIA is not required for these projects only in those instances where development approvals granting entitlement for the project sites were granted prior to the effective date of CMP TIA requirements (i.e., January 1992).

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Appendix C-1: CMP Deficiency Plan Flow Chart

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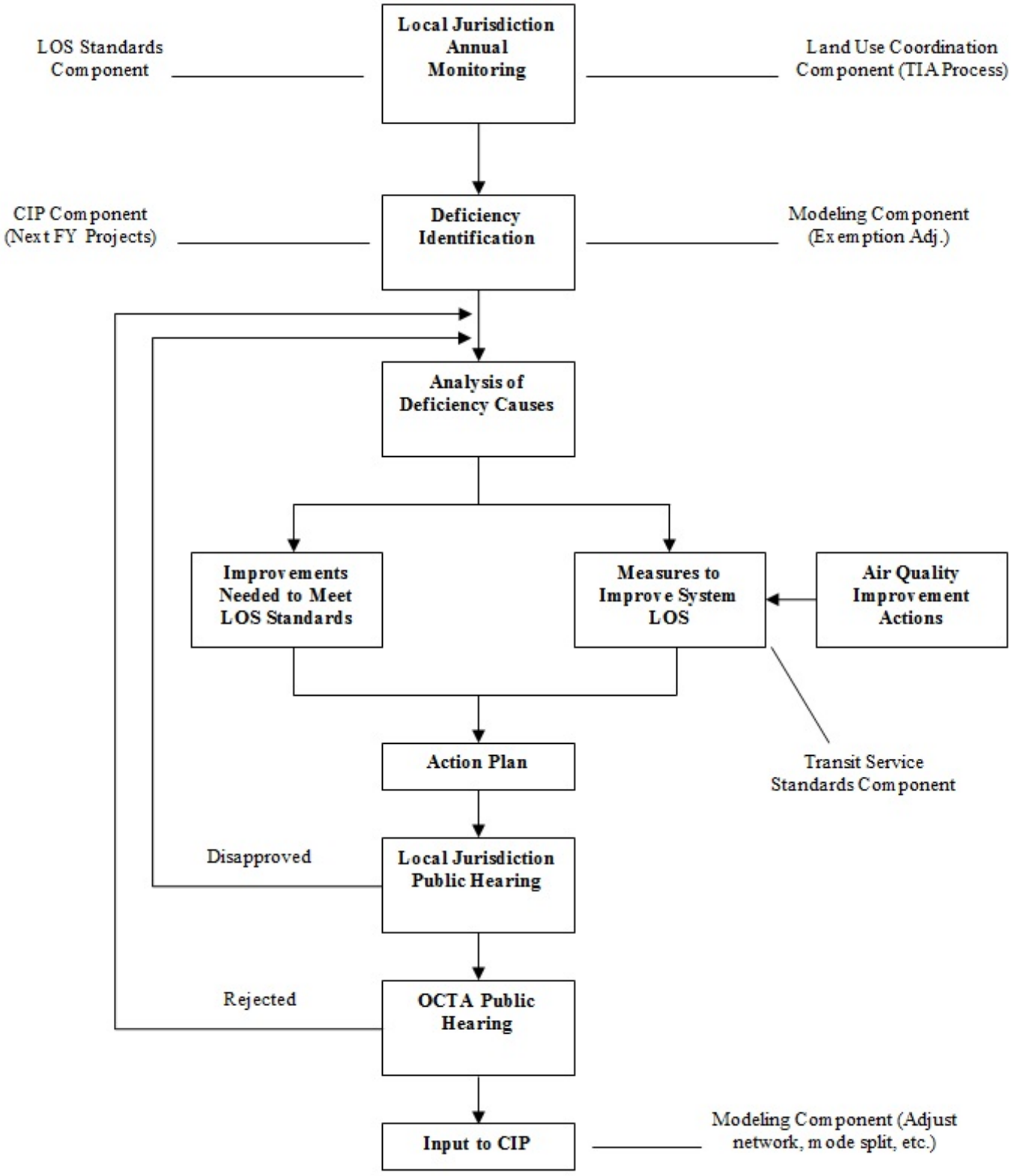
APPENDIX C-1: CMP Deficiency Plan Flow Chart



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Appendix C-2: Deficiency Plan Decision Flow Chart

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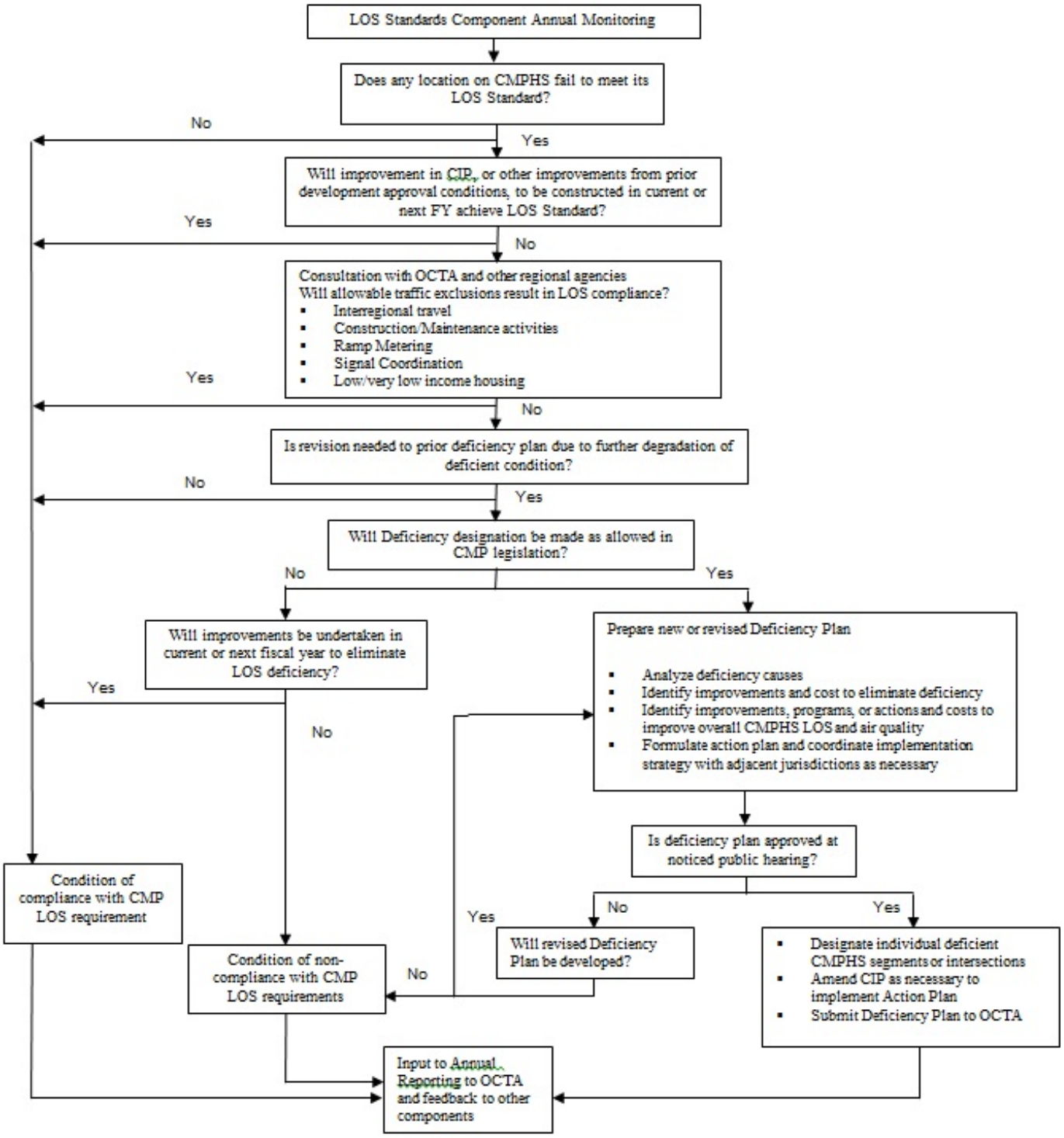
APPENDIX C-2: Deficiency Plan Decision Flow Chart



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Appendix D: CMP Monitoring Checklists

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CMP MONITORING CHECKLIST LEVEL OF SERVICE			
Jurisdiction:			
CMP CHECKLIST	**YES**	**NO**	**N/A**
1. Check "Yes" if either of the following apply: • There are no CMP intersections in your jurisdiction. • Factoring out statutorily-exempt activities[1], all CMP intersections within your jurisdiction are operating at LOS E (or the baseline level, if worse than E) or better.	☐	☐	
NOTE: ONLY THOSE AGENCIES THAT CHECKED "NO" FOR QUESTION 1 NEED TO ANSWER THE REMAINING QUESTIONS.			
2. If any, please list those intersections that are not operating at the CMP LOS standards. • _____ • _____ • _____			☐
3. Will deficient intersections, if any, be improved by mitigation measures to be implemented in the next 18 months or improvements programmed in the first year of any recent funding program (i.e., local agency CIP, CMP CIP, Measure M CIP)?	☐	☐	☐
a. If not, has a deficiency plan been developed for each intersection that will be operating below the CMP LOS standards?	☐	☐	☐
Additional Comments:			
I certify that the information contained in this checklist is true. Signature: _____ Title: _____			

[1] The following activities are statutorily-exempt from deficiency determinations: interregional travel, traffic generated by the provision of low and very low income housing, construction rehabilitation or maintenance of facilities that impact the system, freeway ramp metering, traffic signal coordination by the state or multi-jurisdictional agencies, traffic generated by high-density residential development within ¼ mile of a fixed-rail passenger station, traffic generated by mixed-use residential development within ¼ mile of a fixed-rail passenger station.

CMP MONITORING CHECKLIST DEFICIENCY PLANS			
Jurisdiction:			
CMP CHECKLIST	**YES**	**NO**	**N/A**
1. Check "Yes" if either of the following apply: • There are no CMP intersections in your jurisdiction. • Factoring out statutorily-exempt activities[2], all CMPHS intersections are operating at LOS E (or baseline, if worse than E) or better.	☐	☐	
NOTE: ONLY THOSE AGENCIES THAT CHECKED "NO" FOR QUESTION 1 NEED TO ANSWER THE REMAINING QUESTIONS.			
2. If any, please list those intersections found to not meet the CMP LOS standards. • _____ • _____ • _____			☐
3. Are there improvements to bring these intersections to the CMP LOS standard scheduled for completion during the next 18 months or programmed in the first year of the CIP?	☐	☐	☐
NOTE: ONLY THOSE AGENCIES THAT CHECKED "NO" FOR QUESTION 3 NEED TO ANSWER THE REMAINING QUESTIONS.			
4. Has a deficiency plan or a schedule for preparing a deficiency plan been submitted to OCTA?	☐	☐	☐
5. Does the deficiency plan fulfill the following statutory requirements:			
a. include an analysis of the causes of the deficiency?	☐	☐	☐
b. include a list of improvements necessary to maintain minimum LOS standards on the CMPHS and the estimated costs of the improvements?	☐	☐	☐

[2] The following activities are statutorily-exempt from deficiency determinations: interregional travel, traffic generated by the provision of low and very low income housing, construction rehabilitation or maintenance of facilities that impact the system, freeway ramp metering, traffic signal coordination by the state or multi-jurisdictional agencies, traffic generated by high-density residential development within ¼ mile of a fixed-rail passenger station, traffic generated by mixed-use residential development within ¼ mile of a fixed-rail passenger station.

CMP CHECKLIST continued	YES	NO	N/A
c. include a list of improvements, programs, or actions, and estimates of their costs, which will improve LOS on the CMPHS and improve air quality?	☐	☐	☐
i. do the improvements, programs, or actions meet the criteria established by SCAQMD (see the CMP Preparation Manual)?	☐	☐	☐
6. Are the capital improvements identified in the deficiency plan programmed in your seven-year CMP CIP?	☐	☐	☐
7. Does the deficiency plan include a monitoring program that will ensure its implementation?	☐	☐	☐
8. Does the deficiency plan include a process to allow some level of development to proceed pending correction of the deficiency?	☐	☐	☐
9. Has necessary inter-jurisdictional coordination occurred?	☐	☐	☐
10. Please describe any innovative programs, if any, included in the deficiency plan: _____			☐
Additional Comments:			
I certify that the information contained in this checklist is true. Signature: _____ Title: _____			

CMP MONITORING CHECKLIST LAND USE COORDINATION			
Jurisdiction:			
CMP CHECKLIST	**YES**	**NO**	**N/A**
1. Have you maintained the CMP traffic impact analysis (TIA) process you selected for the previous CMP?	☐	☐	
a. If not, have you submitted the revised TIA approach and methodology to OCTA for review and approval?	☐	☐	☐
2. Did any development projects require a CMP TIA during this CMP cycle?[3]	☐	☐	
NOTE: ONLY THOSE AGENCIES THAT ANSWERED "YES' FOR QUESTION 2 NEED TO ANSWER THE REMAINING QUESTIONS.			
3. If so, how many?			
4. Please list any CMPHS links & intersections that were projected to not meet the CMP LOS standards (indicate whether any are outside of your jurisdiction). • • •			☐
a. Were mitigation measures and costs identified for each and included in your seven-year CIP?	☐	☐	☐
b. If any impacted links & intersections were outside your jurisdiction, did your agency coordinate with other jurisdictions to develop a mitigation strategy?	☐	☐	☐

[3] Exemptions include:
- any development generating less than 2,400 daily trips
- any development generating less than 1,600 daily trips (if it directly accesses a CMP highway)
- final tract and parcel maps,
- issuance of building permits,
- issuance of certificate of use and occupancy,
- minor modifications to approved developments where the location and intensity of project uses have been approved through previous and separate local government actions prior to January 1, 1992.

CMP CHECKLIST continued	YES	NO	N/A
5. If a local traffic model was/will be used, did you follow the data and modeling consistency requirements as described in the CMP Preparation Manual (available online at http://www.octa.net)?	☐	☐	☐
Additional Comments:			
I certify that the information contained in this checklist is true. Signature: _____ Title: _____			

CMP MONITORING CHECKLIST CAPITAL IMPROVEMENT PROGRAM			
Jurisdiction:			
CMP CHECKLIST	**YES**	**NO**	**N/A**
1. Did you submit a seven-year Capital Improvement Program (CIP) to OCTA by June 30?	☐	☐	
2. Does the CIP include projects to maintain or improve the performance of the CMPHS (including capacity expansion, safety, maintenance, and rehabilitation)?	☐	☐	
3. Is it consistent with air quality mitigation measures for transportation-related vehicle emissions?	☐	☐	
4. Was the CIP database computer application provided by OCTA used to prepare the CMP CIP?	☐	☐	
Additional Comments:			
I certify that the information contained in this checklist is true. Signature: _____ Title: _____			

Appendix E: Capital Improvement Programs

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Appendix F: Orange County Subarea Modeling Guidelines

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