San Mateo County
Congestion Management Program
2011

Appendices

APPENDIX A

Detailed Inventory of CMP Roadways and Intersections

Appendix A

Detailed Inventory of CMP Roadways and Intersections

The following pages describe the functional classifications and numbers of lanes of the California State Highways within San Mateo County and the other roadways and intersections included in the 1997 CMP Roadway System. The information described here was collected by conducting field surveys and recording data. The numbers of lanes and roadway types are described for the following State Highways:

SR 1	Between the county lines of Santa Cruz and San Francisco Counties;
SR 35	Between the San Francisco and Santa Clara County lines;
SR 82	Between the county lines of Santa Clara and San Francisco Counties;
SR 84	From SR 1 to the Alameda County line;
SR 92	From SR 1 to the Alameda County line;
U.S. 101	Between the county lines of Santa Clara and San Francisco Counties;
SR 109	From Kavanaugh Drive to SR 84;
SR 114	From U.S. 101 to Bayfront Expressway (SR 84);
I-280	Between the county lines of Santa Clara and San Francisco Counties; and
I-380	Between I-280 and North Access Road (east of U.S. 101).

The numbers of lanes and classifications of the other roadways and the lane configurations and signal phasings of the intersections included in the CMP network were also determined. This information was obtained from the cities in which the facilities are located and from field surveys.

SR 1

From the Santa Cruz County line north to Linda Mar Boulevard, SR 1 is a two-lane conventional highway. Between Linda Mar Boulevard and Westport Drive (just south of Sharp Park Road), SR 1 is a four-lane highway. North of Westport Drive, SR 1 is a four-lane freeway until it reaches its junction with SR 35, where it becomes a six-lane freeway. At its junction with I-280, SR 1 joins I-280 to travel north until John Daly Boulevard. SR 1 then continues northward, as a six-lane freeway, across the San Francisco County line.

SR 35

North of I-280 (near Crestmoor Drive in San Bruno), SR 35 is a two- to four-lane arterial and four-lane expressway which extends northward across the San Francisco County line. The variations in the numbers of lanes and roadway types are described briefly below.

- SR 35 is a four-lane expressway from the I-280 interchange north becoming a two-lane arterial south of San Bruno Avenue.
- SR 35 is a two-lane arterial to the signalized intersection of Sneath Lane, then a four-lane arterial north of Sneath Lane to Sharp Park Road, and a two-lane arterial north of Sharp Park Road to Hickey Boulevard.
- North of Hickey Boulevard, SR 35 becomes a four-lane arterial, and then a four-lane freeway as it passes through the SR 1 interchange.
- Approximately one mile north of the SR 1 interchange, SR 35 becomes a four-lane expressway, and continues as such into San Francisco County.

South of Bunker Hill Drive, SR 35 becomes a two-lane rural road. After a short section where SR 92 and SR 35 share the same roadway, SR 35 becomes Skyline Boulevard south to Santa Clara County.

SR 82 (El Camino Real/Mission Street)

SR 82 is a four- to six-lane arterial which extends north from the Santa Clara County line across the San Francisco County line. The following street segments are ***not* six lanes** wide:

Roble Avenue to Glenwood Avenue	Four lanes
SR 84 overpass to Whipple Avenue	Four lanes
Whipple Avenue to F Street (in San Mateo)	Two lanes northbound, and three lanes southbound
F Street to 42nd Street	Four lanes
42nd Street to Hillsdale Boulevard	Two lanes northbound, and three lanes southbound
East Third Avenue to south of Trousdale Drive	Four lanes
Hickey Boulevard to Mission Road	Four lanes

Westlake Avenue to John Daly Boulevard	Four lanes

SR 84

SR 84 (Woodside Road) is a four-lane arterial between I-280 and SR 82 (except for a short segment between San Carlos Avenue and Santa Clara Avenue which is six-lanes wide). SR 84 is a four-lane expressway between SR 82 and Bay Road. East of Bay Road to U.S. 101, SR 84 is a six-lane expressway. At its junction with U.S. 101, SR 84 joins U.S. 101 to travel south until the Marsh Road exit, where SR 84 follows the Bayfront Expressway to the Dumbarton Bridge. The Bayfront Expressway is six-lane wide from Marsh Road to east of University Avenue.

SR 84 is a two-lane conventional highway from west of I-280 to SR 1. (Note: Signs on U.S. 101 still indicate Willow Road (SR 114) to be SR 84.)

SR 92

SR 92 is a four-lane freeway between I-280 and U.S. 101. SR 92 is a six-lane freeway between U.S. 101 and the Alameda County Line, across the San Mateo Bridge. West of I-280 to SR 1, SR 92 is a two-lane conventional highway.

U.S. 101

U.S. 101 is an eight- to ten-lane freeway in San Mateo County. The lane changes for this north/south facility are as follows:

- U.S. 101 is an eight-lane freeway from the Santa Clara County line to the Whipple Avenue interchange comprising six mixed-flow lanes and two High Occupancy Vehicle (HOV) lanes.

- U.S. 101 is an eight-lane freeway from the Whipple Avenue interchange to the San Francisco County line, with the following two exceptions:

1. Between Marsh Road and Hillsdale Blvd, an auxiliary lane has been added in each direction.

2. Northbound U.S. 101 is six lanes wide between the SR 92 and Kehoe Avenue off-ramps, and five lanes wide between the Kehoe Avenue and Third Avenue off-ramps. Southbound U.S. 101 remains four lanes wide.

3. U.S. 101 is a ten-lane freeway from north of the Millbrae Avenue interchange ramps to south of the I-380 interchange ramps.

SR 109

University Avenue has been designated as SR 109 between SR 84 and Kavanaugh Drive. SR 109 is a four-lane arterial.

SR 114

Willow Road, which has been designated as SR 114 between U.S. 101 and Bayfront Expressway, is a four-lane arterial.

I-280

I-280 is a 6- to 12-lane freeway in San Mateo County. The variations in the number of lanes on this north/south facility are described below.

* I-280 is an eight-lane freeway from the Santa Clara County line north to the I-280/SR 1 interchange in Daly City, with the following exceptions:

    1. Between Edgewood Road and the interchange with SR 92, I-280 contains five northbound and five southbound lanes. Each five-lane segment is approximately two miles long and signed: "Slow Vehicles Keep Right".

    2. Through the I-380 interchange, northbound I-280 has only three lanes, while southbound I-280 widens to include a fifth, auxiliary lane.

* I-280 is a 12-lane freeway, north of the SR 1 interchange (south) to the SR 1 interchange (north).

* I-280 is a six-lane freeway, north of its northern junction with SR 1 to the San Francisco County line, where the freeway widens to eight lanes.

I-380

I-380 is an east/west freeway which connects I-280 and U.S. 101, and extends east of U.S. 101 to provide access to the San Francisco International Airport. Between I-280 and U.S. 101, I-380 is four lanes wide in the westbound direction and three lanes wide in the eastbound direction. East of U.S. 101, I-380 is a freeway ramp, narrowing down to two lanes in each direction and terminating at North Access Road (by United Airlines Maintenance Facility.)

Other CMP Roadways

The CMP roadway system also includes three roadways which are not state highways. These arterials, all located in Daly City, are described briefly below:

- Mission Street is a four-lane arterial that extends from SR 82 (San Jose Avenue) to the northeast, across the San Francisco County line.

- Bayshore Boulevard is an arterial that extends southward from its junction with U.S. 101 in San Francisco County through Brisbane, where it becomes Airport Boulevard. The CMP network only includes the segment of Bayshore Boulevard between the San Francisco County line and Geneva Avenue. This segment is three lanes wide in the northbound direction and two lanes wide in the southbound direction.

- Geneva Avenue is a four-lane arterial that extends to the northwest from Bayshore Boulevard across the San Francisco County line to Mission Street.

CMP Intersections

The CMP roadway system also includes 16 intersections. These were not included in the 1991 CMP and were added for the 1993 CMP. The 16 intersections are:

Geneva Avenue and Bayshore Boulevard
SR 35 (Skyline Boulevard) and John Daly Boulevard
SR 82 (Mission Street) and John Daly Boulevard/Hillside Boulevard
SR 82 (El Camino Real) and San Bruno Avenue
SR 82 (El Camino Real) and Millbrae Avenue
SR 82 (El Camino Real) and Broadway
SR 82 (El Camino Real) and Peninsula Avenue
SR 82 (El Camino Real) and Ralston Avenue
SR 82 (El Camino Real) and Holly Street
SR 82 (El Camino Real) and Whipple Avenue
SR 84 (Bayfront Expressway) and SR 109 (University Avenue)
SR 84 (Bayfront Expressway) and SR 114 (Willow Road)
SR 84 (Bayfront Expressway) and Marsh Road
SR 84 (Woodside Road) and Middlefield Road
SR 92 and SR 1
SR 92 and Main Street.

APPENDIX B

Traffic Level of Service Calculation Methods

Appendix B

Traffic Level of Service Calculation Methods

Level of service (LOS) is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety. The level of service of a facility is designated with a letter, A to F, with A representing the best operating conditions and F the worst.

There are many methods available to calculate the levels of service for the various types of roadways and intersections that comprise San Mateo County's designated Congestion Management Program (CMP) system. The components of the CMP Roadway System include freeways, such as U.S. 101 and I-280; multilane highways; two-lane highways, such as State Route 1 (SR 1), south of Linda Mar; major arterials, such as SR 82 (El Camino Real); and major intersections. Operational analyses of specific weaving sections and ramp junctions have not been included in the CMP but may be added for subsequent CMPs.

AB 471 and AB 1963, the CMP legislation, require that methods of calculating levels of service defined either by the latest version of the *Highway Capacity Manual* (HCM) or by the Transportation Research Board's *Circular 212* be used for the analysis of CMP roadways. San Mateo County has been using the level of service methods specified in the HCM published in 1994 for freeways, multilane highways, two-lane highways, arterials, freeway weaving sections, ramp junctions, signalized intersections, and unsignalized intersections. The TRB's *Circular 212* describes methods for signalized and unsignalized intersections.

The level of service (LOS) calculation methods found in the 1994 HCM for freeways, multilane highways, two-lane highways, and arterials and the calculation for signalized intersections based on TRB's *Circular 212* method are described in this appendix.

Level of Service Calculation Methods

The methods selected to calculate levels of service for the roadway (freeway, multilane highway, two-lane highway, and arterial) segments and intersections included in the CMP network are described below:

Freeways

A freeway is defined as a divided highway facility with two or more lanes in each direction and full control of access and egress. It has no intersections; access and egress are provided by ramps at interchanges.

According to the *Highway Capacity Manual* (1994 HCM), the LOS of freeway segments is based on the density of vehicles, expressed in passenger cars per mile per lane. The LOS can also be evaluated with volume-to-capacity (V/C) ratios, average travel speeds, and maximum service flow rates. The specific LOS criteria for freeways are presented in Table B-1. Illustrations of the various levels of service are presented on Figure B-1.

The selected LOS method for freeway segments is based on calculating V/C ratios for each direction of travel, wherein the traffic volume for each segment is divided by the capacity of the segment. The volumes are obtained from counts for existing conditions or from a travel forecasting model for future conditions. The capacity is estimated as the number of lanes multiplied by 2,200 vehicles per hour per lane four four-lane freeway segments and 2,300 vehicles per hour per lane for segments with six or more lanes. The V/C ratios are calculated and related to LOS based on the relationships presented in Table B-1.

Another method of calculating a freeway segment's level of service is to determine the average travel speed from floating car runs. Descriptions of the average travel speeds for each LOS designation are also presented in Table B-1.

Multilane Highways

Multilane highways generally have posted speed limits of between 40 and 55 miles per hour (mph). They usually have four or six lanes, often with physical medians or two-way left-turn lane medians, although they may also be undivided (have no median). Unlike freeways, multilane highways are interrupted by intersections or driveways.

The level of service criteria for multilane highways are similar to the criteria for freeways. The specific criteria from the HCM are presented in Table B-2. The LOS calculation method is identical to the calculation method for freeways. The only difference is the range of V/Cs and speeds for each LOS designation. The maximum ideal lane capacity for a multilane highway segment is 2,200 vehicles per hour.

Two-Lane Highways

A two-lane highway is defined as a two-lane roadway with one lane for use by traffic in each direction. Passing of slower vehicles requires use of the opposing lane. As volumes or geometric constraints increase, the ability to pass decreases and platoons of vehicles are formed. The delay experienced by motorists also increases. The LOS for two-lane highways is based on mobility. The specific LOS criteria from the 1994 HCM are presented in Table B-3.

For two-lane highways, the selected method, based on V/Cs, takes into account the volume in both directions. The total volume is divided by the total capacity of 2,800 vehicles per hour. The corresponding V/C is correlated to a LOS based on the V/C ranges in Table B-3. Average travel speeds for each LOS designation are also presented in this table.

Table B-1

1994 HCM Level of Service Criteria for Basic Freeway Sections

	70 mph Free-Flow Speed				65 mph Free-Flow Speed				60 mph Free-Flow Speed			
LOS	Density[a] (pc/mi/ln)	Speed[b] (mph)	Maximum[c] V/C	MSF[d] (pcphpl)	Density[a] (pc/mi/ln)	Speed[b] (mph)	Maximum[c] V/C	MSF[d] (pcphpl)	Density[a] (pc/mi/ln)	Speed[b] (mph)	Maximum[c] V/C	MSF[d] (pcphpl)
A	≤ 10.0	≥ 70.0	0.318/0.304	700	≤ 10.0	≥ 65.0	0.295/0.283	650	≤ 10.0	60.0	0.272/0.261	600
B	≤ 16.0	≥ 70.0	0.509/0.487	1,120	≤ 16.0	≥ 65.0	0.473/0.457	1,040	≤ 16.0	60.0	0.436/0.412	960
C	≤ 24.0	≥ 68.5	0.747/0.715	1,644	≤ 24.0	≥ 64.5	0.704/0.673	1,548	≤ 24.0	60.0	0.655/0.626	1,440
D	≤ 32.0	≥ 63.0	0.916/0.876	2,015	≤ 32.0	≥ 61.0	0.887/0.849	1,952	≤ 32.0	57.0	0.829/0.793	1,824
E	≤ 36.7/39.7	≥ 60.0/58.0	1.000	2,200/2,300	≤ 39.3/43.4	≥ 56.0/53.0	1.000	2,200/2,300	≤ 41.5/46.0	53.0/50.0	1.000	2,200/2,300
F	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Variable

[a] Density in passenger cars per mile per lane.
[b] Average travel speed in miles per hour.
[c] Maximum volume-to-capacity ratio.
[d] Maximum service flow rate under ideal conditions in passenger cars per hour per lane.

≤ less than or equal to
≥ greater than or equal to

Note: In table entries with split values, the first value is for four-lane freeways, and the second is for six- and eight-lane freeways.

Source: Transportation Research Board, *Highway Capacity Manual, Special Report 209* (Washington, D.C., 1994), pp. 3-9.

Table B-2

Level of Service Criteria for Multilane Highways

	60 mph Free-Flow Speed				55 mph Free-Flow Speed				50 mph Free-Flow Speed			
LOS	Density[a] (pc/mi/ln)	Speed[b] (mph)	Maximum[c] V/C	MSF[d] (pcphpl)	Density[a] (pc/mi/ln)	Speed[b] (mph)	Maximum[c] V/C	MSF[d] (pcphpl)	Density[a] (pc/mi/ln)	Speed[b] (mph)	Maximum[c] V/C	MSF[d] (pcphpl)
A	≤ 12	≥ 60	0.33	720	≤ 12	≥ 55	0.31	660	≤ 12	≥ 50	0.30	600
B	≤ 20	≥ 60	0.55	1,200	≤ 20	≥ 55	0.52	1,100	≤ 20	≥ 50	0.50	1,000
C	≤ 28	≥ 59	0.75	1,650	≤ 28	≥ 54	0.72	1,510	≤ 28	≥ 50	0.70	1,400
D	≤ 34	≥ 51	0.89	1,940	≤ 34	≥ 53	0.86	1,800	≤ 34	≥ 49	0.84	1,670
E	≤ 40	≥ 55	1.00	2,200	≤ 41	≥ 51	1.00	2,100	≤ 43	≥ 47	1.00	2,000
F	> 40[e]	< 55[e]	-[e]	-[e]	> 41[e]	< 51[e]	-[e]	-[e]	> 43[e]	< 47[d]	-[e]	-[e]

[a] Density in passenger cars per mile per lane.
[b] Average travel speed in miles per hour.
[c] Maximum volume-to-capacity ratio.
[d] Maximum service flow rate under ideal conditions in passenger cars per hour per lane.
[e] Highly variable, unstable.

≤ less than or equal to
≥ greater than or equal to

Source: Transportation Research Board, *Highway Capacity Manual*, Special Report 209 (Washington, D.C., 1994), pp. 7-8.

Table B-3

Level of Service Criteria for General Two-Lane Highway Segments

		V/C Ratio[a]																		
		Level Terrain							Rolling Terrain							Mountainous Terrain						
			% No-Passing Zone							% No-Passing Zone							% No-Passing Zone					
LOS	% Time Delay	Avg.[b] Speed	0	20	40	60	80	100	Avg.[b] Speed	0	20	40	60	80	100	Avg.[b] Speed	0	20	40	60	80	100
A	≤ 30	≥ 58	0.15	0.12	0.09	0.07	0.05	0.04	≥ 57	0.15	0.10	0.07	0.05	0.04	0.03	≥ 56	0.14	0.09	0.07	0.04	0.02	0.01
B	≤ 45	≥ 55	0.27	0.24	0.21	0.19	0.17	0.16	≥ 54	0.26	0.23	0.19	0.17	0.15	0.13	≥ 54	0.25	0.20	0.16	0.13	0.12	0.10
C	≤ 60	≥ 52	0.43	0.39	0.36	0.34	0.33	0.32	≥ 51	0.42	0.39	0.35	0.32	0.30	0.28	≥ 49	0.39	0.33	0.28	0.23	0.20	0.16
D	≤ 75	≥ 50	0.64	0.62	0.60	0.59	0.58	0.57	≥ 49	0.62	0.57	0.52	0.48	0.46	0.43	≥ 45	0.58	0.50	0.45	0.40	0.37	0.33
E	> 75	≥ 45	1.00	1.00	1.00	1.00	1.00	1.00	≥ 40	0.97	0.94	0.92	0.91	0.90	0.90	≥ 35	0.91	0.87	0.84	0.82	0.80	0.78
F	100	< 45	--	--	--	--	--	--	< 40	--	--	--	--	--	--	< 35	--	--	--	--	--	--

[a] Ratio of flow rate to an ideal capacity of 2,800 passenger cars per hour in both directions.

[b] Average travel speed of all vehicles (in mph) for highways with design speed ≥ 60 mph; for highways with lower design speeds, reduce speed by 4 mph for each 10-mph reduction in design speed below 60 mph; assumes that speed is not restricted to lower values by regulation.

≤ less than or equal to
≥ greater than or equal to

Source: Transportation Research Board, *Highway Capacity Manual, Special Report 209* (Washington, D.C., 1994), pp. 8-5.

Arterials

Levels of service for arterials are dependent on the arterial class denoted as Type I, II, or III. Type I arterials are principal arterials with suburban design, 1 to 5 signals per mile, no parking, and free-flow speeds of 35 to 45 miles per hour (mph). Type III arterials have urban designs, with 6 to 12 signals per mile, parking permitted, and are undivided with free-flow speeds of 25 to 35 miles per hour. Type II arterials fall between Type I and III and have free-flow speeds of 30 to 35 miles per hour.

The LOS for an arterial is based on maneuverability, delays, and speeds. As the volume increases, the probability of stopping at an intersection due to a red signal indication increases and the LOS decreases. The specific LOS criteria from the HCM are presented in Table B-4.

For the CMP, a calculation method based on V/C was selected. Volumes on each roadway segment in each direction are divided by the capacity, estimated to be 1,100 vehicles per hour per lane. The capacity was estimated based on a saturation flow rate of 1,900 vehicles per lane and the assumption that El Camino Real would receive 60 percent of the green time.[1] With the assumption that streets perpendicular to El Camino Real would receive 40 percent of each intersection's green time, the reduction in El Camino Real's capacity due to intersecting streets has been accounted for in the method used to analyze levels of service of arterial streets. Except for the 16 designated intersections, the operations of individual intersections, which are the locations where a street capacity is most constrained, are not analyzed for the CMP. Therefore, the levels of service presented for various roadway segments along El Camino Real are likely to be better than the level of service of individual intersections.

The V/C for arterials is correlated to LOS based on the information in Table B-5. The average speeds for each LOS designation are presented in Table B-4.

[1]The estimated capacity for El Camino Real was calculated by multiplying 1,900 vehicles per hour per lane by 0.6, to arrive at 1,140 vehicles per hour per lane which was then rounded off to 1,100 vehicles per hour per lane.

Table B-4
Level of Service Criteria for Arterials

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

Level of Service	Average Travel Speed (mph)		
A	≥ 35	≥ 30	≥ 25
B	≥ 28	≥ 24	≥ 19
C	≥ 22	≥ 18	≥ 13
D	≥ 17	≥ 14	≥ 9
E	≥ 13	≥ 10	≥ 7
F	< 13	< 10	< 7

mph miles per hour
≤ less than or equal to
≥ greater than or equal to

Source: Transportation Research Board, *Highway Capacity Manual, Special Report 209* (Washington, D.C., 1994), pp. 11-4.

Table B-5
CMP Level of Service Criteria for Arterials[a] Based on Volume-to-Capacity Ratios

Level of Service	Description	V/C[b]
A	Free-flow conditions with unimpeded maneuverability. Stopped delay at signalized intersection is minimal.	0.00 to 0.60
B	Reasonably unimpeded operations with slightly restricted maneuverability. Stopped delays are not bothersome.	0.61 to 0.70
C	Stable operations with somewhat more restrictions in making mid-block lane changes than LOS B. Motorists will experience appreciable tension while driving.	0.71 to 0.80
D	Approaching unstable operations where small increases in volume produce substantial increases in delay and decreases in speed.	0.81 to 0.90
E	Operations with significant intersection approach delays and low average speeds.	0.91 to 1.00
F	Operations with extremely low speeds caused by intersection congestion, high delay, and adverse signal progression.	Greater Than 1.00

[a] For arterials that are multilane divided or undivided with some parking, a signalized intersection density of four to eight per mile, and moderate roadside development.

[b] Volume-to-capacity ratio.

•• greater than or equal to.
< less than.

Source: Transportation Research Board, *Highway Capacity Manual, Special Report 209* (Washington, D.C., 1994).

Signalized Intersections

The TRB *Circular 212* Planning method is the selected level of service calculation method for the designated intersections in the San Mateo County's CMP Roadway System. A signalized intersection's level of service, according to the method described in TRB *Circular 212,* is based on dividing the sum of the critical volumes by the intersection's capacity. This calculation yields the volume-to-capacity ratio (V/C). The critical movements are the combinations of through movements plus right-turn movements if there is no exclusive right-turn lane, and opposing left-turn movements that represent the highest per-lane volumes. Descriptions of levels of service for signalized intersections, together with their corresponding V/Cs, are presented in Table B-6.

Table B-6
Intersection Level of Service Definitions

Level of Service	Interpretation	V/C Ratio
A	Uncongested operations; all queues clear in a single signal cycle.	Less Than 0.60
B	Very light congestion; an occasional approach phase is fully utilized.	0.60 to 0.69
C	Light congestion; occasional backups on critical approaches.	0.70 to 0.79
D	Significant congestion on critical approaches, but intersection functional. Cars required to wait through more than one cycle during short peaks. No long-standing queues formed.	0.80 to 0.89
E	Severe congestion with some long-standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersections(s) upstream of critical approach(es).	0.90 to 0.99
F	Total breakdown, stop-and-go operation.	1.00 and Greater

In the TRB *Circular 212* method, the capacity of an intersection is based on an average saturation flow rate and percent lost time. The saturation flow rate is the maximum number of vehicles per lane that can pass a fixed point in one hour with 100 percent green time. The

average saturation flow rate measured in San Mateo County is 1,980 vehicles per hour of green per lane (vphpgpl). The lost time is the time when vehicles are not entering the intersection due to changes in signal indications. Percent lost time is the lost time divided by the cycle length. The average percent lost time measured in San Mateo County for intersections with four or more phases is 12 percent. The intersection capacities, based on San Mateo County data, for signalized intersections with two, three, and four or more signal phases are presented in Table B-7. These capacities are used with the *Circular 212* Planning method to evaluate the levels of service for San Mateo County's CMP intersections.

Table B-7
Intersection Capacities

Number of Signal Phases	Capacity (in vph)
2	1,850
3	1,760
4 or more	1,700

APPENDIX C

BAAQMD's Deficiency List

Final

DEFICIENCY LIST:

PROGRAMS, ACTIONS AND IMPROVEMENTS

FOR INCLUSION IN CONGESTION MANAGEMENT PROGRAM

"DEFICIENCY PLANS"

Bay Area Air Quality Management District

Planning Division

939 Ellis Street

San Francisco, CA 94109

For more information, contact David Marshall at (415) 749-4678

Adopted by the District Board of Directors

November 4, 1992

BEFORE THE BOARD OF DIRECTORS
OF THE
BAY AREA AIR QUALITY MANAGEMENT DISTRICT

In the Matter of Adopting a Deficiency List for Use in Conjunction with County Congestion Management Programs)

RESOLUTION NO. 2119

WHEREAS, Section 65089 of the Government Code requires that a Congestion Management Program be developed and adopted for every county that includes an urbanized area;

WHEREAS, Deficiency Plans are a part of the Congestion Management Program process;

WHEREAS, Deficiency Plans must include a list of improvements, programs, or actions, and estimates of costs, that will measurably improve the level of service of the system and contribute to significant improvements in air quality;

WHEREAS, Section 65089.3 of the Government Code requires this District to establish and periodically revise a list of approved improvements, programs and actions which meet requirements included in the Section;

WHEREAS, District staff has prepared a proposed Deficiency List which comprises a list of programs, actions and improvements to be used by cities and counties in preparing Deficiency Plans, and a statement of policy the District will follow in updating the list and in considering items not included in the list but proposed for consideration in a Deficiency Plan;

WHEREAS, the proposed Deficiency List was discussed with affected and interested parties and was revised in response to comments received from such parties;

WHEREAS, District staff recommends that this Board adopt the Deficiency List attached hereto; and

WHEREAS, this Board concurs with the recommendation of the staff.

NOW, THEREFORE, BE IT RESOLVED that this Board hereby adopt the proposed Deficiency List attached hereto comprising a list of programs, actions and improvements for use in the preparation of Deficiency Plans and a statement of policy the District will follow in updating the list and in considering items not included in the list but proposed for consideration in a Deficiency Plan.

The foregoing resolution was duly and regularly introduced, passed and adopted at a regular meeting of the Board of Directo of the Bay Area Air Quality Management District on the Motion of

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Director McPeak, seconded by Director McKenna, on the 4th day of November 1992 by the following vote of the Board:

AYES: Aramburu, Battisti, Britt, Campbell, Harberson, Harper, Head , Hilligoss, McKenna, McPeak, Ogawa, Powers.

NOES: Hancock.

ABSENT: Achtenberg, Bruno, Cooper, Davis, Diridon, Eshoo, Fogarty.

M. Patricia Hilligoss

M. PATRICIA HILLIGOSS
Vice-Chairperson of the Board of Directors

ATTEST:

Paul Battisti

PAUL BATTISTI
Secretary of the Board of Directors

BAY AREA AIR QUALITY MANAGEMENT DISTRICT · STATE OF CALIFORNIA ·

Certified as a True Copy

Clerk of the Boards

INTRODUCTION

This document contains the Bay Area Air Quality Management District's list of improvements, programs and actions for inclusion in Congestion Management Program Deficiency Plans. Deficiency Plans are a part of the Congestion Management Program (CMP) process. Under the CMP process, each urbanized county in California establishes a county wide road system consisting of all Interstates, state highways and major arterials, along with a Level of Service (LOS) standard.[1] When traffic conditions on a roadway segment or intersection falls below the LOS standard, the local jurisdiction is required to develop a Deficiency Plan. In some instances, cities and counties may be monitoring LOS based upon transportation models, attempting to predict conditions in the future. The intent is to develop plans for deficient segments prior to the actual occurrence of a deficiency.

The requirements for Deficiency Plans are set forth in Government Code Section 65089.3(b). The plans are to include four elements: A) an analysis of the cause of the deficiency; B) a list of improvements and their estimated costs which would enable the deficient road segment or intersection to maintain a LOS at the standard or better; C) a list of improvements, programs, or actions that will measurably improve the Level of Service of the road system and contribute to significant improvements in air quality; D) An action plan to implement either option B) or C) above, including a specific implementation schedule and a description of funding. The full text of Section 65089.3(b) is reprinted in Attachment 1.

The CMP statutes direct the Bay Area Air Quality Management District, as the air district for most of the nine-county Bay Area[2], to establish and periodically update a list of improvements, programs and actions which can be used by local governments in developing element C of the Deficiency Plans. The list should include items that " ... (i) measurably improve the level of service of the system ..., and (ii) contribute to significant improvements in air quality, such as improved public transit service and facilities, other rideshare programs and promotions, improved non-motorized transportation facilities, high occupancy vehicle facilities, and transportation control items." The statutes also state that "[i]f an improvement, program, or action is not on the approved list, it shall not be implemented unless approved by the local air quality management district."

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1 Level of Service, commonly abbreviated as LOS, is a method of measurement of congestion that compares actual or projected traffic volume with the maximum capacity of the facility under study. LOS ranges from A to F, with F describing the most congested conditions. Except in a few instances, the standard established in the CMPs of the nine Bay Area counties is LOS E. Some counties have designated LOS D for facilities located within undeveloped and rural areas.

2 The Bay Area Air Quality Management District includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, the western part of Solano, and the southern part of Sonoma Counties.

Confusion has arisen over whether a city or county in its Deficiency Plan can recommend widening a "deficient" highway segment or expanding a "deficient" intersection to resolve a level of service deficiency. The CMP legislation provides for that option as noted in element B above. However, even when a jurisdiction knows in advance that it wants to opt for a "direct fix" to the problem, it still must prepare a Deficiency Plan because the segment has become deficient (determined through LOS monitoring). In that Deficiency Plan, the jurisdiction still must develop element C of the Plan that evaluates improvements, programs and actions contained on the BAAQMD's list.

The CMP process is largely directed at alleviating and avoiding peak-period roadway congestion. Because of this, the Deficiency List contains items intended to help reduce peak-period motor vehicle travel, although many items on the list will also work to reduce travel during other periods of the day. The Deficiency List does not contain certain "market-based" revenue and pricing measures (e.g., gas tax increase, higher bridge tolls, congestion pricing, smog fee, "pay as you drive" insurance, etc.). Each of these need (1) state enabling legislation prior to any city or county action to implement, and (2) a well-orchestrated regional implementation strategy to ensure success. For these reasons, the market-based measures are not appropriate for the Deficiency List at this time.[3]

In a region as large and diversified as the Bay Area, it would be difficult to identify improvements, programs and actions that individually work to "...measurably improve the level of service of the system...and contribute to significant improvements in air quality...". The items that have been included on our list work in some degree to improve roadway conditions and lessen air pollution. The degree to which each item does both varies: Some are very strong improvers of traffic congestion, but make small contributions in improvements to air quality; others help to improve air quality, but offer very little in the way of traffic relief; and then still others offer little in both categories, yet are very necessary as supporting measures.[4] Because of this, emphasis should be given to the benefits derived from combining the various measures, viewing their effectiveness in terms of joint application.

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3 The Deficiency List does include Parking Management (measure E6) through pricing strategies.

4 Certain measures included on the District's list focus on providing alternatives to the single occupant vehicle that will benefit the Region's air quality in the long term. Implementation of these measures as part of a deficiency plan may contribute to or cause localized congestion for motor vehicles (examples include Signal Preemption by Transit Vehicles [B11] and Bus Stop Bulbs [B12]). Without changes to State law, a jurisdiction could have to prepare a Deficiency Plan to remedy a level of service deficiency caused by implementation of a measure (or measures) on this list.

The following measures have been included in this initial Deficiency List, but will undergo further evaluation due to revised air pollutant emissions factors recently released by the California Air Resources Board (CARB):

- Accelerated implementation of the *2005 HOV Master Plan* (D3)
- Auxiliary Lanes of up to One Mile in Length Where HOV Lanes are Provided (F3)
- Signalization Improvements (F4)
- Computerized Traffic and Transit Control/Management on Arterials (F5)

These new emissions factors show that vehicles emit more Carbon Monoxide and Hydrocarbons at speeds greater than 35 miles per hour. Following: (1) resolution of the current debate among CARB, the U.S. Environmental Protection Agency (EPA), Caltrans, the Federal Highway Administration (FHWA) and MTC on emissions factors for vehicle speeds of 20-50 miles per hour, or (2) more technical information becoming available, BAAQMD staff will reassess the appropriateness of these measures for the Deficiency List. Furthermore, Ramp Metering (F2) has the potential to create Carbon Monoxide "hot spots" since vehicles must idle while waiting to enter the freeway. Queues that develop at metered freeway entrances can cause motorists to opt to take short trips on local arterials, resulting in more emissions for the entire trip than would have occurred had the motorist waited in the queue to take the trip via freeway. When more technical information on the air quality impacts of ramp metering becomes available, BAAQMD staff will reassess the appropriateness of these measures for the Deficiency List.

The BAAQMD will reevaluate the measures on this list following preparation of revised regional transportation/air quality planning documents designed to replace current planning documents of the same name:

- Regional Transportation Plan (1993)
- Ozone State Implementation Plan (to be prepared for Federal air quality standards) (1993)
- Bay Area 1994 Clean Air Plan (to be prepared for State air quality standards)

Although the statutes do not call for guidance on the implementation of the items on the Deficiency List, BAAQMD staff has provided some. The guidance is general in nature, and is directed towards providing a basis by which local jurisdictions, Congestion Management Agencies and other interested groups can determine the adequacy of a Deficiency Plan. The guidance is not intended to serve as a "cookbook" that specifies the degree to which each item shall be implemented in a particular jurisdiction. Experience gained through the implementation of the items on the list should help District staff in

updating and improving the list. Future versions may contain actions specific to certain Counties or municipalities.

Section I is the District's draft list of programs, actions and improvements to be used by cities and counties in preparing Deficiency Plans. **California law *mandates* that cities and counties select measures from the list in Section I when preparing Deficiency Plans.**

Section II contains the *policy* the BAAQMD will follow in updating the list and for considering items not included on the list but proposed for inclusion in a Deficiency Plan.

Appendix A presents the BAAQMD's guidance on how the draft Deficiency List should be implemented by local governments. **Information in Appendix A is *advisory*. California law does not specify the scope or quantity of measures on the list necessary to mitigate or "offset" a level of service deficiency.**

This document was prepared by David Marshall and Michael Murphy, Senior Planners, Planning Division / Environmental Review Section.

SECTION I

LIST OF PROGRAMS, ACTIONS, AND IMPROVEMENTS FOR INCLUSION IN DEFICIENCY PLANS

Cities/Counties/CMAs' use is mandatory (required by California law)

The items that comprise the list of programs, actions and improvements that cities and counties can incorporate into Deficiency Plans are described below. Each description indicates whether the item is most suitable for local implementation, county wide or corridor level implementation.

Although the items have been grouped into six categories, many are complementary and their individual effectiveness will be increased if undertaken together. For instance, the success and advantages of High Occupancy Vehicle lanes will be enhanced if preferential treatment of buses, carpools and vanpools is designed into parking areas, local arterials and freeway on- and off-ramps.

Each category is preceded with a listing of the Transportation Control Measures (TCM) from the *'91 Clean Air Plan* that will be directly implemented or in some fashion be supported by the items on the list. The development and implementation of Deficiency Plans is not viewed as the main avenue for the implementation of the TCMs in the *'91 Clean Air Plan*. Clearly though, implementation of system-wide improvements through Deficiency Plans can only benefit the success of the strategies set forth in the TCMs.

A. BICYCLE AND PEDESTRIAN MEASURES

A1. Improved Roadway Bicycle Facilities and Bike Paths. Roadways could be improved to provide increased safety and convenience for bicyclists. Improvements include:

- widening shoulders or curb side pavement
- lane re-striping and/or removal of on-street parking to create a wider outside (right) lane for bicycles thus reducing bicycle and automobile conflicts
- installing, marking and/or modifying sensitivity of detection loops at intersections to trigger light changes and allow bicycles to clear the intersection
- completing and expanding Class I bike paths and Class II bicycle lanes that are in the circulation elements of general plans

Caltrans standards shall be followed in designing and constructing bicycle improvements. This measure is suitable for both local and system-wide implementation.

A2. Transit and Bicycle Integration. This measure is intended to increase the number of bus and train routes capable of transporting bicycle riders, as well as improving interconnection between the two modes. Communities in San Mateo, Santa Clara and San Francisco Counties could work with the CALTRAIN Joint Powers Board to allow bicycles on CALTRAIN and to assure peak period bicycle accommodation on the new California cars (when acquired). Communities within the BART service area could work with BART to better accommodate bicycles during commute periods through downtown Oakland and San Francisco, as well as shortening or eliminating the periods during which bicycles are barred from the BART system. An alternative could be to provide special peak-period BART runs in the commute direction that accommodate bicycles. Communities, working with relevant transit districts, could work to increase the number of bus routes and rail services allowing access to bicyclists, as well as providing increased numbers of bicycle lockers (for regular users) and racks that allow use of the U-Bar style locks (for occasional users) at transit transfer centers and other interconnection points. This measure should be implemented on a system-wide basis since most transit service is on a multi-city basis. Local governments that operate their own transit service should implement this measure locally.

A3. Bicycle Lockers and Racks at Park and Ride Lots. Park and ride lots accessible to bicycles should contain bicycle lockers (for regular users) and racks that allow use of the U-Bar style locks (for occasional users). Jurisdictions will have to include in their Deficiency Plans the initial number of storage spaces and criteria for installing additional spaces. Communities can also consider establishing "Bike and Ride" lots: areas along major transit routes designated for bicycle storage only, separate from automobile parking lots. This measure can be implemented on a local basis.

A4. Bicycle Facilities And Showers At Developments. As part of any new office/industrial/commercial/school/special generator and multi-family (four or more units) residential development generating more than 50 person trips per day, cities and counties could require the inclusion of bicycle storage facilities and, for office/industrial/commercial/school/special generator developments employing more than 100 employees, showering and changing rooms. Bicycle storage facilities include bicycle lockers and racks (must allow use of the U-Bar style locks) which are located close to the main entrances or inside of buildings. Existing sites should add bicycle storage facilities and, for developments/buildings/sites employing more than 100 employees, showering and changing rooms where feasible. This measure can be implemented on a local basis.

A5. Improved Pedestrian Facilities. It is the general practice for new development to include sidewalks and other pedestrian facilities. However, efforts can be made to improve and expand upon current requirements and practices to make walking a more integral part of the transportation system. City and county zoning ordinances and design standards should be revised as appropriate to ensure safe, convenient and direct pathways for pedestrians between their residences, shopping and recreational areas, and work sites. Other efforts include requiring, where appropriate, the provision of walkways in commercial and residential areas linking building entrances to street sidewalks and crossings, and linking building entrances to adjacent building entrances and activity centers. Communities can also require continuous and clearly marked pathways across parking lots between sidewalks and building entrances. A preferable approach is to locate entrances and building fronts along street sidewalks, with parking spaces at the sides and rears of buildings. This measure is suitable for local implementation. (See also Land Use Measures [E8].)

A6. Pedestrian Signals. To encourage more walk trips, pedestrian signals should be added on major arterials to enhance safety. This measure should be implemented locally.

A7. Lighting for Pedestrian Safety. Communities can require and install adequate lighting for sidewalks, bus stops, bicycle parking areas and vehicle parking lots to create conditions that are safe for pedestrians. There may be special hardware requirements that must be met for implementation of this measure in proximity to facilities sensitive to light pollution (e.g., Lick Observatory). This measure is suitable for local implementation.

B. TRANSIT (Includes bus, rail and ferry services)

B1. Improvement of Bus, Rail and Ferry Transit Services. This measure is directed at improving public and private transit service. Cities, counties and employers will need to (1) work with the relevant transit districts and private operators to identify appropriate routes for reducing headways, extending service, improving transfers, and coordinating project design and services to new development; and (2) contribute financially toward both capital and operating costs of service improvements. Emphasis should be placed on providing service that will reduce peak period automobile trips (e.g., express and commuter bus/rail/ferry service). Service expansion should be coordinated with the relevant Short Range Transit Plan(s) and also support local and regional trip reduction efforts. This measure should be implemented on a system-wide basis.

B2. Expansion of Rail Transit Service. This measure is directed at extending or expanding rail transit beyond the projects included in MTC's New Rail Starts Program

outlined in MTC Resolution 1876. Emphasis should be placed on expanding rail service to corridors not included in Resolution 1876 that will experience rapid growth in peak period automobile trips. Cities and counties will need to work with local, regional, state and federal transportation agencies to define projects and establish institutional arrangements to construct and operate the services, and fund operating costs. This measure can be implemented locally and on a system-wide basis, and should be considered in conjunction with Improvement of Bus, Rail and Ferry Transit Services (B1).

B3. Expansion of Ferry Services. Freeways, bridges and transit connections around and across San Francisco Bay are heavily congested. High speed ferry service offers an efficient and comfortable transportation alternative. New or enhanced service should focus on peak period travel when congestion is greatest. An example would be to provide high speed commuter ferry service between Vallejo and the San Francisco Ferry Terminal as a reliever of peak period congestion on I-80 in Contra Costa and Alameda counties. This measure should be implemented on a corridor or system-wide basis.

B4. Preferential Treatment for Buses and In-Street Light Rail Vehicles (LRVs). This measure includes strategies that give preference to buses and in-street light rail vehicles, including transit stops at building entrances, bus shelters, LRV platform boarding areas, direct HOV to HOV connecting lanes and ramps, exclusive bus/LRV lanes, bypass lanes at metered freeway ramps, including reserved lanes around any queues that may form on connecting streets or at congested off-ramps. These strategies should be a part of a coordinated regional and/or county HOV system, with individual communities assisting with changes that affect local streets or development review/approval. This measure can be implemented both locally and on a system-wide basis.

B5. Transit Information and Promotion. This measure is intended to work with the Transit and Bicycle Integration (A2), Stricter Travel Demand Management/Trip Reduction Ordinances (E1) and Public Education Programs (E2). Cities and counties can:

- advertise the availability of transit in their communities
- post transit schedules at bus stops
- enhance access to transit via non-motorized modes (e.g., bicycling and walking)
- provide for special accommodation of clean fuel/electric vehicles at rail and ferry stations (e.g., preferential parking and free electric outlets)

Cities and counties must coordinate their recommendations with relevant organizations such as local transit district(s), MTC, RIDES for Bay Area Commuters, Inc., Berkeley TRiP,

San Benito Rideshare, Santa Clara County's Commuter Network, Santa Cruz Share-a-Ride, Solano Commuter Information[1] and the BAAQMD for enhancements to existing programs or implementation of new programs. Promotional activities should be directed at *all* trips, including those for shopping, recreation, commuting and school. This measure can be implemented both locally and on a system-wide basis.

B6. Transit Pricing Strategies to Encourage Ridership and, where applicable, Reduce Transit Vehicle Crowding. Pricing incentives and alternative fare structures can encourage ridership and, where necessary, reduce transit vehicle crowding. These incentives and strategies include subsidy from alternative revenue sources to reduce fares, zonal fares, peak hour fares, elimination of discounts for elder citizens who travel at peak times and free or reduced cost transit on "Spare the Air" day.[2] Transit pricing changes should ideally be done in conjunction with service improvements. Communities can work with neighboring cities and transit agencies to identify and subsidize appropriate incentive programs. This measure, especially appropriate for cities or counties that operate their own transit system, should be implemented on a system-wide basis.

B7. Transit Fare Subsidy Programs. These programs generally are implemented at employment sites in the form of direct employer subsidy of employee transit fares, usually with some monthly or yearly ceiling. Where cities/counties require employers to subsidize transit fares to meet trip reduction requirements, such programs must also equally subsidize persons who use non-motorized modes (e.g., bicycle or walk). Other subsidy programs could be directed towards school, recreational and shopping trips. This program can be implemented locally for a city or county's own employees, or a city or county can include a transit fare subsidy requirement for employers in its local trip reduction ordinance, or a city or county can condition new development to include such programs as a part of the city or county's development approval process.

B8. Transit Centers. To assist current and potential riders in obtaining route information, schedules, and passes, cities and counties would establish (or provide funds for transit agencies to establish) transit centers. The centers can be patterned after Berkeley TRiP. Another option is a mobile, clean fueled/electric "commute store" that would visit activity

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[1] San Benito County, Santa Cruz County and eastern Solano County are outside the BAAQMD's jurisdiction. Reference is made to services offered in these jurisdictions since they are considered within the commute shed of the greater Bay Area.

[2] Depending on how the strategies are constructed, they have potential to significantly impact operating revenue. Any proposal should fully evaluate the impact on operating revenue and identify replacement revenue to cover any potential loss to the transit operator(s). "Spare the Air" day occurs when the BAAQMD forecasts that atmospheric conditions on the following day are likely to result in an exceedance of the health based State ozone standard. Major employers and the media are notified to advise employees and the general public that activities contributing to ozone formation should be limited.

centers and employment sites to disseminate transit, ridesharing, and non-motorized travel information (e.g., maps of bike routes, bicycle commuter handbooks, and city walking guides). A second option is to install electronic kiosk centers, which are able to dispense tickets, route information, and in some cases, assist with ride matching operations. Another option is to franchise out the centers to mailbox services, photocopying centers, or other such establishments. Centers could also be established at community centers. Centers should be established at all major transit transfer points. This measure can be implemented both locally and on a system-wide basis.

B9. Improved and Expanded Timed Transfer Programs. Shortening the time passengers wait when transferring between buses, from bus to train or vice-versa, and between transit systems is an important improvement to transit service. Working with the relevant transit districts, cities and counties would need to identify the best locations for timed transfers and which routes would be best suited for schedule adjustments. Current plans to institute timed transfers should be considered for accelerated implementation. This measure should be implemented on a system-wide basis.

B10. Improved and Expanded Fare Coordination. Through the encouragement of MTC, BART and several Bay Area transit operators have developed a fare card that is used to debit fares on BART and also serve as a semi-monthly "flash pass" on major Bay Area bus systems. Each month more people purchase this card, demonstrating the public's desire for a simplified Bay Area transit fare structure. MTC is working diligently with transit operators to test and implement a "universal" fare card. Cities and counties can work in partnership with MTC, CMAs and relevant transit districts to develop and implement fare coordination agreements, and contribute financially to the necessary hardware, software, equipment maintenance and, where applicable, operator subsidies.

B11. Signal Preemption by Transit Vehicles. Transit vehicles could be equipped with preemption devices that hold or trigger a green light in order to avoid delays at intersections. Since implementation of this measure could be highly disruptive to traffic flow in an optimally timed, signalized corridor, and thus increase emissions, affected local governments should work closely with transit agencies to implement signal preemption only where most appropriate. This measure should be implemented on a system-wide or corridor basis.

B12. Bus Stop Bulbs. A strategy to improve passenger pickup and off-loading is to extend sidewalks across the parking lane to the first through traffic lane. Such an extension is called a bus stop bulb. With bus stop bulbs, buses are not delayed merging back into traffic after stops, and cars are prevented from blocking the stops, both of which improve bus travel time.[3]Some transit agencies prefer bus turn outs (which remove the

bus from the traffic stream for passenger loading to minimize delay to motorists and allow the bus to reenter the traffic stream only when an adequate gap in traffic becomes available), while others prefer neither bus turn outs nor bus bulbs. Cities or counties that want to implement Bus Stop Bulbs (B11) should work closely with their respective transit agency(ies). The District does not consider bus turn outs as an appropriate alternative to bus stop bulbs since turn outs favor single occupant vehicles and lengthen bus travel times. This measure can be implemented both locally and on a system-wide basis.

B13. School Bus Transit Service. This measure is directed at establishing school bus services in school districts where bus service has been reduced or eliminated. Reinstating or expanding school bus service would provide an alternative to many students who drive to school or are driven to school by others. Reinstating or expanding school bus service would also provide capacity on existing public bus services for commuters displaced by student riders. Cities and counties will need to work with school districts to establish arrangements for funding the service. This measure would be implemented locally or system-wide.

C. CARPOOLING, BUSPOOLING, VANPOOLING, TAXIPOOLING, JITNEYS, CASUAL CARPOOLING AND OTHER SHARED RIDES (Ridesharing)

C1. Preferential Treatment for Shared Ride Vehicles. This measure includes strategies that give preference to carpools, buspools, vanpools, taxipools, jitneys and other shared rides, including reserved parking spaces next to building entrances, transit stops at building entrances, direct HOV to HOV connecting lanes and ramps, bypass lanes at metered freeway ramps, including reserved lanes around any queues that may form on connecting streets or at congested off-ramps. These strategies should be a part of a coordinated regional and/or county HOV system, with individual communities assisting with changes that affect local streets or development review/approval. This measure can be implemented both locally or on a system-wide basis.

C2. Increased use of Commuter/Employer Services. To increase the number of carpools and vanpools, commuters and employers should be encouraged to use the free computerized ridematching services provided by RIDES for Bay Area Commuters, Inc., Berkeley TRiP, San Benito Rideshare, Santa Clara County's Commuter Network, Santa Cruz Share-a-Ride and Solano Commuter Information.[3] RIDES maintains a database that serves commuters in the nine Bay Area counties and several outlying counties. RIDES'

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database is electronically linked to ridesharing programs in San Benito County, Santa Clara County, Santa Cruz County, Solano County and the City of Berkeley as well as to ridesharing programs of several Bay Area employers. As an integral part or cities' and counties' trip reduction efforts, employers of all sizes should encourage their employees to take advantage of these services. In addition, employer services offered by RIDES, Santa Clara County's Commuter Network, Solano Commuter Information and Berkeley TRiP could serve as an integral part of training, education and outreach efforts for employee transportation coordinators. This measure can be implemented locally or on a system-wide basis.

D. HIGH OCCUPANCY VEHICLE (HOV) FACILITIES

D1. Preferential Treatment for HOVs. See measures B4 and C1.

D2. Bus and Carpool/Buspool/Vanpool/Taxipool Priority Lanes on Local Arterials. This measure is aimed at providing time savings for buses and car/bus/van/taxipools on local arterials. Many peak period commute trips occur on congested local streets. Provision of the Priority lanes during the commute periods will act as an incentive for ridesharing. In some instances, this measure can be combined with Restrictions on Curb-Side Deliveries and On-Street Parking (F11) to provide lanes without taking away mixed flow capacity. (However, streets with existing or planned bicycle lanes should not have the parking lane converted, as this could cause conflicts between bicyclists and motor vehicles.) Cities and counties incorporating this measure in their Deficiency Plan should indicate how any proposed priority lanes will supplement or otherwise support any county-wide or regional HOV plans. This measure should be implemented on a system-wide basis.

D3. Accelerated Implementation of the *2005 HOV Master Plan*. The Metropolitan Transportation Commission (MTC), Caltrans, and the California Highway Patrol (CHP) have identified a regional system of High Occupancy Vehicle Lanes. Some of the projects have already been programmed for funding and completion by 1995. The remainder are assumed for completion by 2005. Communities can place a greater priority on these projects so that they can be constructed before the year 2005. For areas, such as Solano County, which are not included in the *2005 HOV Master Plan*, emphasis can be placed on developing HOV lanes identified in another study, such as the *I-80 Strategic Plan*. Cities and counties should work with MTC, Caltrans and the CHP to evaluate HOV lanes on freeway segments not included in the *2005 HOV Master Plan*.

The technical analysis accompanying the *2005 HOV Master Plan* indicated that successful HOV lanes require support facilities, such as park and ride lots, express bus service and exclusive HOV bypass lanes and connecting ramps. It is recommended that Deficiency

Plans incorporating this measure focus on providing support facilities for HOV lanes. Some, such as by-pass lanes and connecting ramps, would be constructed at the time the HOV lane is constructed. Others, such as park and ride lots and improved transit service should be implemented prior to the opening of the HOV facility. This measure can largely be implemented on a system-wide basis, although supporting actions can be done on a local basis. *(See note on page 3 regarding this measure.)*

D4. HOV to HOV Facilities. Local government work with Caltrans and CMAs to identify and program for construction ramps that provide a direct connection between HOV facilities. This could significantly reduce travel time for HOVs that otherwise would be required to negotiate a very slow merge across three or four lanes of single occupant vehicle (SOV) traffic twice in order to exit one freeway and enter another. This measure can be implemented on a system-wide basis.

D5. Direct HOV Lane Entrance/Exit Ramps to Arterials and Special Generators. Where high volumes of HOVs would benefit from direct access to freeway or expressway HOV lanes, direct HOV ramps should be provided for (1) arterials that provide access to major activity centers and (2) connecting roadways to special generators (e.g., airports, stadiums, universities, military facilities, etc.). This measure could be implemented region-wide or locally.

E. OTHER TCMS, RELATED MEASURES.

E1. Stricter Travel Demand Management/Trip Reduction Ordinance. As part of a Deficiency Plan, a city or county will modify their mandated Trip Reduction Ordinance to include requirements *beyond* those either currently identified or recommended in their county's CMP. After the adoption of the BAAQMD's Employer-Based Trip Reduction Rule, jurisdictions would revise their programs to go *beyond* the requirements embodied in the District's rule and other local trip reduction requirements, where applicable. This program can be implemented locally.

E2. Expanded Public Education Programs. A Public Education program should be an essential part of any Deficiency Plan. Jurisdictions can include educational materials regarding air quality and congestion relief and the use of the automobile with programs dealing with waste recycling, water conservation, etc. The conservation of air quality and the efficient use of the transportation system are messages compatible with other waste reduction and resource conservation programs. Public education programs might include the following topics:

- health effects of air pollution and traffic congestion
- the air pollution effects of older cars and cars that are out of tune
- list of available low emission vehicles (electric, natural gas, methanol, etc.) and their sellers
- the air pollution effects of cold starts and short trips
- the benefits of linking trips for shopping, errands, recreation, work, particularly during the afternoon on weekdays and during the weekend
- the role of alternative means of transportation in improved regional air quality, local congestion relief, and reduced energy use
- the benefits of compact development, particularly near transit stations
- the benefits of leaving the car at home at least one or two days a week
- the benefits of taking feeder buses, bicycling or walking to regional rail or bus transfer centers and other destinations
- advertising the location, cost and availability of discount transit tickets
- educational materials designed for use in school curricula

The BAAQMD has already begun a public education program for the region. Materials developed as part of the program will be available to cities and counties. RIDES for Bay Area Commuters, Inc., Berkeley TRiP, San Benito Rideshare, Santa Clara County's Commuter Network, Santa Cruz Dial-a-Ride, and Solano Commuter Information each provide a variety of public information and services available to cities, counties, CMAs, transit agencies, employers and other transportation agencies/organizations.[4] Educational materials should also be developed for planning and zoning commissions and governing boards that make land use and transportation decisions impacting air quality. This program can be implemented locally.

E3. Child Care Facilities at or close to Employment Sites, Transit Centers and Park and Ride Lots. Many commuters need to drop off and pickup their children at child care. The intent of this measure is for jurisdictions to facilitate the location of child care facilities at, or more likely, close to employment sites, major transit centers (e.g., BART, CalTrain and Santa Clara Light Rail stations, and park and ride lots. The intent is to shorten or eliminate the automobile portion of the commute trip. Jurisdictions and employers may need to provide financial incentives to operators of such facilities. This program can be implemented locally. (See also Land Use Measures [E8].)

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E4. Retail Services at or close to Employment Sites, Transit Centers and Park and Ride Lots. Trips could be eliminated and perceived transit waiting time would be reduced if retail services (e.g., automated bank teller machines (ATMs), dry-cleaners, coffee shops, book stores, etc.) were offered in conjunction with employment sites, transit centers and park and ride lots. Jurisdictions could provide incentives for and work with transit operators to encourage development at or in immediate proximity to areas where people wait to take a bus or train. Activity at or near a transit center or park and ride lot would also enhance safety and thus increase patronage. (See also Land Use Measures [E8].)

E5. Telecommuting Centers and Work-at-Home Programs. Under this measure, jurisdictions and employers would facilitate through discussions with major employers:

- the creation of centers in their communities for telecommuting
- implementation of programs that allow employees to work at home

Businesses would rent space in the center for their employees to work, being connected by telephone wires to the main office and/or allow their employees where appropriate to work at home one or two (or more) days per week. This program can be implemented locally.

E6. Parking Management. This is a broad measure, overlapping with measures dealing with employer-based trip reduction and traffic flow improvements. Jurisdictions can implement parking charges, restrict parking during peak hours along busy corridors, require preferential parking for carpools and vanpools at major activity centers, require shared parking arrangements at developments, land bank parking space, establish automobile free zones, parking standards in zoning ordinances to discourage vehicle trips (e.g., establish maximum parking ratios rather than minimum ratios, revise minimum ratios to require fewer spaces, etc.). This program can be implemented locally.

E7. Parking "Cash-Out" Program/Travel Allowance. AB 2109 (Katz, Ch. 92-0554) requires employers of 50 persons or more who provide a parking subsidy[5] to employees to offer a parking cash-out program. Under a parking cash-out program, the employer offers to provide a cash allowance to an employee equivalent to the parking subsidy that the

5 "Parking subsidy" is defined as the difference between the out-of-pocket amount paid by an employer on a regular basis in order to secure the availability of an employee parking space and the price, if any, charged to an employee for use of that space.

employer would otherwise pay to provide the employee with a parking space.[6] Employees who wish to continue to drive will receive a parking space in lieu of the cash allowance. Employees who forego the use of parking can use the travel allowance for any purpose, including subsidizing the use of alternative transportation modes. Employers may also offer transit passes or ridesharing subsidies as all or part of the travel allowance to help reduce the tax impact on employees.[7]

As part of a deficiency plan, a city or county could pass an ordinance, amend its trip reduction ordinance, or work with employers to implement parking cash-out programs that go beyond this new State requirement.[8] Examples include:

- include employers with fewer than 50 employees
- include employers that own their own parking spaces, using the market rate for parking in the area as the cost of parking and the amount of the cash travel allowance
- require or encourage building owners to separate the cost of parking from the cost of leasing office space, thereby facilitating/requiring parking cash-out programs in multi-tenant office complexes
- implement a parking cash-out program at city/county employment sites as a model for other employers

This program, which should be implemented locally, must be designed to minimize any adverse impact on parking in neighborhoods adjacent to the participating employment sites.

E8. Land Use Measures. Land use exerts a strong influence on travel patterns and transportation mode choice. Site design strategies (e.g., clustering and minimizing walk distance to transit) also influence mode choice. Strategies which local governments can undertake include revising general plan policies and land use designations, zoning ordinances and design standards to provide for:

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6 AB 2109 also requires cities and counties in which a commercial development will implement a parking cash-out program which is included in a CMP pursuant to subdivision (b) of Government Code Section 65089 or a deficiency plan pursuant to Government Code Section 65089.3 to grant that development an appropriate reduction in the parking requirements otherwise in effect for new commercial development.

7 Under State and Federal law a cash travel allowance is considered gross income and is therefore taxable. Transit subsidies and some other ridesharing subsidies are not taxable up to varying amounts, depending upon State or Federal tax law.

8 To meet the requirements of this Deficiency List, cities and counties must require that the employer program not be designed to disproportionately favor use of any alternative mode (e.g., giving a travel allowance to the employee in the form of a "Commute Check" that can be used for public transit only, and offering no equivalent monetary benefit for those who rideshare, bicycle or walk).

- phase development to occur near current transit service (i.e., infill)
- mixed land uses where residences, work places and services are located close enough together to minimize the need for private motorized transportation between them[9]
- pedestrian oriented design, such as sidewalks, adequate crosswalks on major streets, building entries near sidewalks rather than behind parking lots, and convenient transit stops
- affordable housing near major employment sites
- incentives for infill development
- higher densities at transit stops and along major transit lines
- sites for alternative fuel vehicle fueling facilities

This measure can be implemented both locally and on a system-wide basis. (See also Improved Pedestrian Facilities [A5], Child Care Facilities at or close to Employment Sites, Transit Centers and Park and Ride Lots [D3] and Retail Services at or close to Employment Sites, Transit Centers and Park and Ride Lots [D4].)

F. TRAFFIC FLOW IMPROVEMENTS.

F1. Preferential Treatment of HOVs. See measure B4 and C1.

F2. Ramp Metering. Caltrans District 4 is currently working on a comprehensive ramp metering program for the region's freeways. Ramp metering must include bypass lanes for buses and carpools. Jurisdictions placing this measure in their Deficiency Plans must show how they will work with Caltrans and MTC to help fund and assist in expediting the implementation of ramp metering on freeway ramps within their community. Solano County would coordinate with any ramp metering plans developed by Caltrans, District 10. This measure would be implemented on a system-wide basis. *(See note on page 3 regarding this measure.)*

F3. Auxiliary Lanes of Up to One Mile in Length Where HOV Lanes are Provided. This measure would allow the addition of freeway auxiliary lanes between interchanges of not more than one mile in length (i.e., in locations with closely spaced interchanges) to promote ease of HOV lane access and egress and provide for safe merging of conflicting

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[9] Cities and counties, prior to zoning for or approving housing or other sensitive receptors (e.g., schools, hospitals or convalescent facilities) near industry should consider the nature of activity that may occur and whether that activity does/could pose a risk of nuisance (e.g., odors) or potential public health problems. Similar care should be taken when considering locating industry or related land uses near residences and other sensitive receptors. BAAQMD Planning Division staff is available in such cases to advise cities and counties of appropriate action and mitigation strategies (e.g., buffer zones) where feasible.

traffic. This measure is for *freeways only* (not expressways), since expressway auxiliary lanes would diminish the safety of bicyclists. This measure would be implemented on a system-wide basis. *(See note on page 3 regarding this measure.)*

F4. Signalization Improvements. Jurisdictions would be expected to improve signal timing and sequencing to smooth traffic flow and increase average speeds during the peak periods. Jurisdictions could identify roadways to undergo signalization improvements, as well as a timetable for doing so. Jurisdictions that have planned improvements can use those programs. Signalization improvements should be coordinated with any programs to improve signalization and preemption advantages for transit vehicles. This measure would be implemented on a system-wide basis. *(See note on page 3 regarding this measure.)*

F5. Computerized Traffic and Transit Control/Management on Arterials. This measure includes installing traffic sensors, closed circuit television, low wattage "highway-advisory radio" broadcasts, and centrally controlled changeable message signs on local arterials to convey current traffic and transit information. This driver and transit rider information system will supply travelers with real-time traffic and transit information to assist them in planning routes and times of travel. This will be especially helpful in reducing congestion from surges of traffic such as special events, sporting events and parades. *(See note on page 3 regarding this measure.)*

F6. Turn Lanes at Intersections. This measure would be applicable on arterials where placement of a maximum of one left turn lane and/or a maximum of one right turn lane per approach would significantly reduce average stopped delay at an intersection. Double left- or double-right turn lanes would not be appropriate at intersections or freeway/arterial on/off ramps since these create an unfriendly environment for trips by non-motorized modes (pedestrian, bicycle and other travel).[10] This measure would be implemented locally.

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[10] An exception to the double turn lane restriction for arterial/arterial intersections would be appropriate only in cases where all of the following criteria are met: (1) the curb to curb distance remains the same for all approaches after changes to intersection geometry; (2) the width of the median (if any), which serves as pedestrian refuge, is not reduced to accommodate changes to intersection geometry; (3) the signal cycle length is reduced so pedestrians have more frequent opportunities to cross the intersection; (4) the minimum green time in each phase (for pedestrian crossing) is maintained or increased; and (5) the width of the right most through lane is maintained or increased from its width prior to changes to intersection geometry (for bicyclists' safety).

F7. Turn Restrictions at Intersections. This measure consists of restricting turns at some intersections throughout the day or during peak periods only. This measure can be implemented locally.

F8. Reversible Lanes. This measure is applicable on arterials in areas of employment concentration, where congestion occurs in the inbound direction in the morning and the outbound direction during the afternoon. It consists of temporarily increasing the capacity of the congested direction, with the reversed lane dedicated as an exclusive lane for buses, carpools and vanpools. This program can be implemented locally.

F9. One Way Streets. In areas of high traffic volumes, jurisdictions can convert roadways to one-way streets. This measure has been employed in many of the larger central business districts within the Bay Area. Jurisdictions using this measure should identify streets to be converted to one-way and an implementation schedule. However, streets should not have the parking lane taken away where this would cause conflicts between bicyclists and motor vehicles by decreasing the lane area for bicyclists.[11] This program can be implemented locally.

F10. Targeted Traffic Enforcement Programs. Where double parking, parking in bus stops, "gridlock" or illegal use of HOV lanes pose a problem, jurisdictions can provide additional parking and traffic enforcement to help manage congestion. This program can be implemented locally.

F11. Restrictions on Curb Side Deliveries and On-Street Parking. This measure is intended as a peak hour measure. The intent is to handle peak flows without adding permanent capacity to the roadway. It is expected that this measure would be used in conjunction with measures to provide arterial HOV lanes or transit priority lanes facilities. In some instances, restrictions may only apply to one-side or for a portion of a roadway/arterial, depending on the peak-flow. This measure may also be useful in handling congestion around commercial areas during their peak period. Jurisdictions may require that all deliveries be made at the rear of buildings, if space and building lot design allows. This program can be implemented locally.

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[11] A combination bus and bike lane would be acceptable since the frequency of buses is limited.

SECTION II

BAAQMD ADMINISTRATION OF DEFICIENCY LIST

DISTRICT REVIEW OF MEASURES NOT ON THE APPROVED LIST

Section 65089.3(b)(1)(c) of the State Government Code requires that any programs, actions or improvements **included in a Deficiency Plan** which are not taken from the adopted District list may not be implemented unless approved by the District.[1] To facilitate the timely review of such measures the following procedures should be followed.

(1) The District's Air Pollution Control Officer (APCO) and the appropriate Congestion Management Agency should be notified concurrently at the earliest practicable date of any local government's intent to seek District approval of an unlisted measure.

(2) A complete description of the proposed measure(s) should be submitted to the District and the appropriate CMA concurrently. We recommend that the submittal include all documentation demonstrating the effectiveness of the proposed measure in reducing VMT on the CMP system. The District will inform the local government in writing within thirty days if additional information is needed. Review of the measure(s) will not commence until all needed information has been received by the District.

(3) Once all relevant information has been received regarding the measure(s), the District Board of Directors, upon receiving a recommendation from the APCO, will either approve or disapprove the measure(s) within ninety (90) days. The APCO will notify the local government and the applicable Congestion Management Agency concurrently in writing of the reasons for the determination.

BIENNIAL UPDATE OF LIST

The list will be updated every two years, immediately following the period during which Congestion Management Agencies make their determinations that local governments conform (or do not conform) to requirements of the CMP legislation. Changes to the measures on the list or to the procedures governing their implementation will be adopted by the District's Board of Directors at a regularly scheduled meeting. Drafts of any changes will be available for public review at least two months prior to the Board taking action. District staff will continue its regular, ongoing consultative process with CMAs, MTC, Caltrans and ARB through the Clean Air/Congestion Management Working Group.

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[1] Following adoption of this Deficiency List by the BAAQMD Board of Directors, California Congestion Management Program (CMP) law does not prohibit cities, counties, CMAs and Caltrans from continuing to manage congestion by including in their **Capital Improvements Programs** traffic flow improvements that are thought to have a long term detrimental effect on air quality (e.g., freeway, expressway, and arterial widening for single occupant vehicles and intersection improvements of any geometry). The law does however preclude cities and counties from placing in a **Deficiency Plan** any program, action or improvement not on this Deficiency List, unless approved by the BAAQMD according to administrative procedures outlined in this section.

Attachment 1

Excerpts from Government Code of the State of California (as amended in 1992 by the California Legislature [AB 2109/AB 3093]).

65089.3

(a) The agency shall monitor the implementation of all elements of the congestion management program. Annually, the agency shall determine if the county and cities are conforming to the congestion management program, including, but not limited to, all of the following:

(1) Consistency with levels of service and performance standards, except as provided in subdivisions (b) and (c).

(2) Adoption and implementation of a trip reduction and travel demand ordinance.

(3) Adoption and implementation of a program to analyze the impacts of land use decisions, including the estimate of the costs associated with mitigating these impacts.

(b) (1) A city or county may designate individual deficient segments or intersections which do not meet the established level of service standards if, prior to the designation, at a noticed public hearing, the city or county has adopted a Deficiency Plan which shall include all of the following:

(A) An analysis of the causes of the deficiency.

(B) A list of improvements necessary for the deficient segment or intersection to maintain the minimum level of service otherwise required and the estimated costs of the improvements.

(C) A list of improvements, programs, or actions, and estimates of costs, that will (i) measurably improve the level of service of the system, as defined in subdivision (b) of Section 65089, and (ii) contribute to significant improvements in air quality, such as improved public transit service and facilities, improved non-motorized transportation facilities, high occupancy vehicle facilities, parking cash-out programs, and transportation control measures. The air quality management district or the air pollution control district shall establish and periodically revise a list of approved improvements, programs, and actions which meet the scope of this paragraph. If an improvement, program, or action is on the approved list and has not yet been fully implemented, it shall be deemed to contribute to significant improvements in air quality. If an improvement, program, or action is not on the approved list, it shall not be implemented unless approved by the local air quality management district or air pollution control district.

(D) An action plan, consistent with the provisions of Chapter 5 (commencing with Section 66000) of Division 1 of Title 7, that shall be implemented, consisting of improvements identified in paragraph (B), or improvements, programs, or actions identified in paragraph (C), that are found by the agency to be in the interest of the public's health, safety and welfare. The action plan shall include a specific implementation schedule.

(2) A city or county shall forward its adopted Deficiency Plan to the agency. The agency shall hold a noticed public hearing within 60 days of receiving the Deficiency Plan. Following the hearing, the agency shall either accept or reject the Deficiency Plan in its entirety, but the agency may not modify the Deficiency Plan. If the agency rejects the plan, it shall notify the city or county of the reasons for that rejection.

APPENDIX A

Cities/Counties/CMAs' use is advised (not required by California law)[1]

Procedures for the implementation of the list of programs, actions and improvements developed by the Bay Area Air Quality Management District in response to the Congestion Management legislation is outlined below. The items listed in Section I provide a wide range of options from which communities can choose during the development of a Deficiency Plan. One of the key issues that will confront the preparers of Deficiency Plans is how many of the items from the list must be included in a particular plan.

The responsibility for determining the adequacy of a Deficiency Plan rests with the Congestion Management Agencies. The CMAs can either accept or reject a Deficiency Plan, but may not modify it. The CMAs will be responsible for developing appropriate criteria for determining the adequacy of Deficiency Plans submitted by the communities. To assist the CMAs with this task, we have included a methodology for assessing whether or not enough of the items from the list have been included in a Deficiency Plan.

The approach that we have chosen revolves around the offsetting of a deficient facility's contribution to congestion and air quality. A Deficiency Plan is adequate if it includes sufficient items from the District's list to offset over the system the increased amount of vehicle miles travelled (VMT) on the deficient facility due to its operation at LOS F rather than LOS E.[2] The basic steps in the process are described below.

STEP 1 - Identify v/c Ratio That Must be Mitigated:

Use the county wide transportation model to identify the volume to capacity (v/c) ratio of the deficient segment. The amount by which this v/c ratio exceeds (or is projected to exceed) the upper limit of the Congestion Management level of service standard (e.g., 0.99 for LOS E) is the v/c ratio increment that must be mitigated through implementation of items on the BAAQMD's list.

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1 The next few years will offer a number of opportunities for cities and counties to examine different ways of choosing deficiency strategies as they come up with plans mitigating congestion on parts of the network that have failed the Level of Service (LOS) test. We urge cities, counties and CMAs to encourage experimentation in alternative methods to match LOS deficiencies with congestion management and air quality strategies and remedies.

2 The BAAQMD acknowledges that not every measure on the Deficiency List will reduce VMT (see Introduction). Some measures do more to improve congestion than air quality (e.g., traffic flow improvements, HOV lanes involving highway widening, etc. These measures have been included on the Deficiency List because they support other air beneficial measures (e.g., an HOV lane supports ridesharing) or encourage jurisdictions to implement low cost, cost effective strategies to enhance personal/vehicular mobility (e.g., lane re-striping and signs for one-way streets/reversible lanes to increase vehicle throughput and lane re-striping and signs to create wide outside lanes for bicycles).

Let's say the forecast v/c ratio is 1.12 (LOS F) and the v/c ratio necessary to achieve the county wide LOS Standard is 0.99 (upper limit of LOS E). This would mean that mitigation items would need to be identified that offset a v/c ratio 'deficiency' of 0.13.

STEP 2 - Translate the v/c Ratio Deficiency to Vehicle Miles Traveled (VMT)

Consider the segment of U.S. 101 from Novato to Petaluma in Marin and Sonoma Counties.[3] This segment of U.S. 101 is approximately seven miles in length and hypothetically both Marin and Sonoma Counties' transportation models agree its projected northbound traffic volume in the 2000 PM Peak Hour is 4,039.

0.13 x 7 x 4,039 = 3,675 VMT

Thus, 3,675 VMT would need to be mitigated through items from the BAAQMD list.

STEP 3 - Identify Items that Offset the VMT Deficiency

The BAAQMD has prepared a list of Deficiency Plan mitigation items that improve traffic conditions and benefit air quality throughout the Bay Area. The city, county or CMA preparing a Deficiency Plan may choose any of these items, individually or in combination. Since we recognize certain items may be more effective at reducing VMT in a given geographic area, we have outlined two options to assess the adequacy of Deficiency Plan items:

Option 1: Use Region wide Effectiveness Data. The data contained in Table 1 reflect region wide effectiveness of various TCMs in the '91 Clean Air Plan.[4] (This table is forthcoming; not included in this draft.) The proportion of the Deficiency Plan item (or '91 Clean Air Plan TCM) defined in Table 1 that the local government identifies funding for in the Deficiency Plan and implements (or effects implementation) prior to the end of the 7-Year CIP horizon year is the proportion of VMT reduction for which credit can be taken. Detail on applying Option 1 is presented below under "Examples."

Option 2: Exercise County wide Transportation Model. The VMT reduction effects of certain Deficiency Plan items (e.g., transit improvements) may be analyzed more accurately using a county wide transportation model. Certain Deficiency Plan items (e.g., new bicycle lockers) could not be analyzed using a county wide transportation model.

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3 This segment of U.S. 101 currently operates at LOS F, and as allowed by statute, both Marin and Sonoma counties have established a LOS standard of F for the segment. Thus this is not a segment for which a Deficiency Plan will be required. Both the example selected and the numbers used are intended for illustration only.

4 "Transportation Control Measures for the San Francisco Bay Area: Analyses of Effectiveness and Costs," prepared for the BAAQMD by Deakin, Harvey, Skabardonis, Inc., July 1991 (revised October 1991). Copies of this report are available from the BAAQMD upon request.

Examples of Option 1

1. Provide funding for the BAAQMD-delegated Region wide Trip Reduction Rule to apply to 61,000 additional employees in Marin and Sonoma Counties (beyond requirements of the rule).

The rule was assumed in the '91 Clean Air Plan to apply to 3 Million employees.
61,000/3,000,000 = 0.02033 (just over 2%)

1999 VMT (Daily) = 110,856,000
Effectiveness of TCM at reducing VMT = 3.2% (from Table 1)

110,856,000 x 0.032 = 3,547,392 daily VMT reduced by implementation of rule throughout Bay Area, or 354,739 peak-hour VMT (estimated at 10% of daily)

354,739 VMT x 2.033% = 7,212 VMT reduced during the peak hour as a result of implementing the Deficiency Plan Item

2. Provide support for RIDES staff to inform 5,000 employees at Hamilton Field about commute alternatives

The TCM was assumed to apply to 250,000 employees.
5,000/250,000 = 0.02 (2%)

1999 VMT (Daily) = 110,856,000
Effectiveness of TCM at reducing VMT = 0.18% (from Table 1)

110,856,000 x 0.0018 = 199,541 daily VMT reduced by implementation of program throughout Bay Area, or 19,954 peak-hour VMT (estimated at 10% of daily)

19,954 VMT x 2% = 399 VMT reduced during the peak hour as a result of implementing the Deficiency Plan Item. This would mean that 40 of the 5,000 informed about commute alternatives traveling during the peak hour actually shift modes, assuming an average trip length of 10 miles.

3. Fund Phase II bus service expansion at $12.88 Million/yr. The CMAs would spearhead member local governments in the 101 Corridor entering into a service agreement with the Golden Gate Bridge, Highway and Transportation District to provide additional service in the U.S. 101 Corridor from Santa Rosa to San Francisco.

The TCM was assumed to implement new bus service costing $140 Million/yr.
12.88/140 = .092 (9.2%)

1999 VMT (Daily) = 110,856,000
Effectiveness of TCM at reducing VMT = 0.4% (from Table 1)

110,856,000 x 0.004 = 443,424 daily VMT reduced by implementation of service expansion throughout Bay Area, or 44,342 peak-hour VMT (estimated at 10% of daily)

44,342 VMT x 9.2% = 4,079 VMT reduced during the peak hour as a result of implementing the Deficiency Plan Item.

Summary of Examples

The items in Examples 1 or 3 would be adequate to offset the required 3,675 peak hour VMT reduction. The item selected for Example 2 would not be sufficient to offset the required VMT reduction. Thus, additional Deficiency Plan items would need to be identified in conjunction with the item in Example 2.

Content of Deficiency Plans

Each Deficiency Plan should show the amount of VMT[5] to be offset, the data it was derived from, and how each item selected from the BAAQMD's list contributes to the offsetting of the VMT increment. All calculations done should be clearly presented.

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5 Recognizing that all information in Appendix A of this list is advisory and not required by California law, CMAs may elect to use surrogate measures of deficiency in lieu of VMT (e.g., vehicle trips, average vehicle speed, etc.), especially where level of service monitoring conducted by the CMA and/or its cities does not produce data necessary for calculating v/c ratios and VMT (e.g., "floating car" speed surveys).

Table 1

1997 Deficiency Measure Effectiveness
(to be used for improvements implemented by 2000)

Deficiency Measure	Related CAP TCM	Description	Quantity	Percentage Region Wide Daily VMT Reduced	Amount Region Wide Daily VMT Reduced
A1	9	Bicycle Plan Impl Ph I	$3 M/yr. TDA Article 3	0.01	11,890
	9	Bicycle Plan Impl Ph II	$5 M/yr. developer mit/TRO	0.02	23,781
A2	5, 9	Transit/Bicycle Integration		No information available	
A3	9	Bike Lockers/Racks @ PNR Lots		No information available	
A4	9, 16	Bike Facilities/Showers		No information available	
A5	16	Impr Pedestrian Facilities		No information available	
A6	16	Pedestrian Signals		No information available	
A7	16	Lighting for Ped Safety		No information available	
B1	3	Bus Service Exp Ph I	$1 M/yr.	0.17	202,135
	3	Rail Service Exp Ph II	$100 M/yr.	0.60	713,418
	3	Bus Service Exp Ph II	$140 M/yr.	0.40	475,612
	4	Rail Ext Ph II/MTC Reso 1876	$140 M/yr.	0.70	832,322
	5	Rail Access Impr Ph II	$50 M/yr.	0.30	356,709
B2	6	Intercity Rail Ph II	$10 M/yr.	0.04	47,561
B3	7	Reg Ferry Plan Impl	$10 M/yr.	0.03	35,671
B4	8, 12, 16	Pref Treatment Bus/LRT		No information available	
B5	5, 13	Transit Info/Promotion		No information available	
B6	13	Bus-Rail Xfer Subsidy	$5 M/yr.	0.05	59,452
	13	Reduced Transit Fares	$10 M/yr.	0.10	118,903
B7	13	Employer Transit Subsidy		No information available	

Deficiency Measure	Related CAP TCM	Description	Quantity	Percentage Region Wide Daily VMT Reduced	Amount Region W Daily VM Reduc
B8	13	Transit Ticket Distrib	50% employer subsidy for 10% workers	0.06	71,342
	13	Transit Stores	$3 M/yr.	0.02	23,781
B9	13	Improved Timed Xfers		No information available	
B10	13	Fare Coordination	Impr inter-dist wait times 10%	0.05	59,452
B11	12	Transit Signal Preempt	$2 M/yr.	0.02	23,781
B12	12, 16	Bus Stop Bulbs		No information available	
B13	10	School Bus Services	$5 M/yr.	0.03	35,671
	10	50% Student Fare Subsidy	$5 M/yr.	0.02	23,781
C1	15	Ridesharing Toll Elimin	$20 M/yr.	0.30	356,709
C2	1	Employer Audits	$750,000/yr.	0.18	214,026
D1	8	Pref Treatment for HOVs		No information available	
D2	12	HOV Lanes on Arterials		No information available	
D3	8	HOV Sys Exp Ph II	$50 M/yr.	0.45	535,064
D4	8	HOV to HOV Facilities		No information available	
D5	8	Direct HOV Entr Ramps		No information available	
E1	2	TRO Stricter than BAAQMD Rule:			
	2	Employees at sites < 100 empls	1,200,000	0.50	594,515
	2	$3.00 Worksite Parking Charge	2,880,000	1.90	2,259,158
E2	1	ETC Training Materials	$15,000/yr.	0.02	23,781
E3	16, 18	Childcare Facilities		No information available	
E4	16, 18	Retail Services		No information available	
E5	20	Telecommuting		No information available	

Deficiency Measure	Related CAP TCM	Description	Quantity	Percentage Region Wide Daily VMT Reduced	Amount Region Wide Daily VMT Reduced
E6	22	Non-work Parking Charges	Min. $0.80 hr./Empl. 100% transit subsidy	4.20	4,983,929
E7	15, 22	Work Parking Charges/Cash Out		No information available	
E8	16	Indirect Source Ctrl	$12 M/yr. Design mod. new/exist	0.80	951,225
	18	Incr Density nr Transit	200 DUs @ Rail sta./rezoning	0.05	59,452
F1	8, 12, 16	Pref Treatment Bus/LRT		No information available	
F2	11, 12	Ramp metering		No information available	
F3	8 (as support)	Freeway Auxiliary Lanes		No information available	
F4	12	Signal Timing Ph I		Thought to increase VMT	
	12	Signal Timing Ph II		Thought to increase VMT	
F5	11	CCTV/Incident Mgt		Thought to increase VMT	
	11	Traffic Advisory Sys		Thought to increase VMT	
F6	12 (as support)	Turn Lanes @ Intersections		No information available	
F7	12 (as support)	Turn Restr @ Intersections		No information available	
F8	12 (as support)	Reversible Lanes		No information available	
F9	12 (as support)	One Way Streets		No information available	
F10	12 (as support)	Targeted Traffic Enforcement		No information available	
F11	12 (as support)	Delivery/Parking Restrictions		No information available	

Table 1 Assumptions and Notes

(1) Percentage VMT reductions taken from Transportation Control Measures for the S Francisco Bay Area: Analyses of Effectiveness and Costs, Deakin, Harvey, Skabardonis Inc., July 1991 (revised October 1991). Data adjusted by BAAQMD staff for Deficiency List measures B13 and E1 based on additional information known about project/rule implementation as of October 1992.

(2) Daily VMT in 1997 for Nine County Bay Area = 118,903,077
Source: Transportation Improvement Program for the Nine County San Francisco Bay Area, Volume III. Metropolitan Transportation Commission, September 23, 1992, Table A.1, p. III-B-74.

(3) Use peak hour factor of roadway segment to calculate peak hour VMT reduction associated with each measure. If unknown, assume 10% for arterials and 8% for freeways/expressways.

(4) Quantities involving a dollar expenditure per year are assumed to have a five year lifespan. For example, if City A wants to spend $500,000 over 5 years toward the lease of space and staff to operate a transit store as a deficiency plan measure, City A would take credit for implementation of $500,000/$15,000,000 (or 3.3%) of that measure. Daily VMT would be reduced 23,781 x 0.033, or 785 VMT; peak hour VMT would be reduc 2,378 x 0.033, or 79 VMT. Deficiency plans that include measures involving ongoin operating costs would need to make a guarantee of continued funding as part of plan.

APPENDIX D

Guidelines for Deficiency Plan

Appendix D

Deficiency Plan Guidelines

Process

The processes for developing and approving deficiency plans are described on the following flow charts. Figure 7-1 describes the general deficiency plan process. Figure 7-2 depicts the deficiency identification process based on the biennial LOS monitoring process.

Figure 7-3 illustrates the process to be followed for development of two types of single-jurisdictional deficiency plans: location-specific and citywide. A location-specific deficiency plan is required for a deficiency at a single location wholly located within a single jurisdiction and caused by traffic from that jurisdiction. A citywide deficiency plan is required for deficiencies at several locations within a single jurisdiction all caused by traffic from that jurisdiction.

There are also two types of multi-jurisdictional deficiency plans, areawide and cross-county boundaries. An areawide deficiency plan is required for a deficiency located within San Mateo County and caused by traffic generated by more than one jurisdiction, all located within San Mateo County and for a deficiency located within San Mateo County caused by a traffic generator located within San Mateo County and owned by a jurisdiction outside of San Mateo County. The process for areawide deficiency plans is illustrated on Figure 7-4.

A cross-county boundary deficiency plan would be applicable for a deficiency with significant traffic contributions from other counties. These types of deficiency plans are not required by the law because they can be Aresolved@ by the exclusion of interregional traffic. It is C/CAG's intent to work with CMAs of contributing counties to jointly develop deficiency plans for these locations. The process for cross-county boundary deficiency plans is presented on Figure 7-5.

Figure 7-1

DEFICIENCY PLAN GENERAL PROCESS

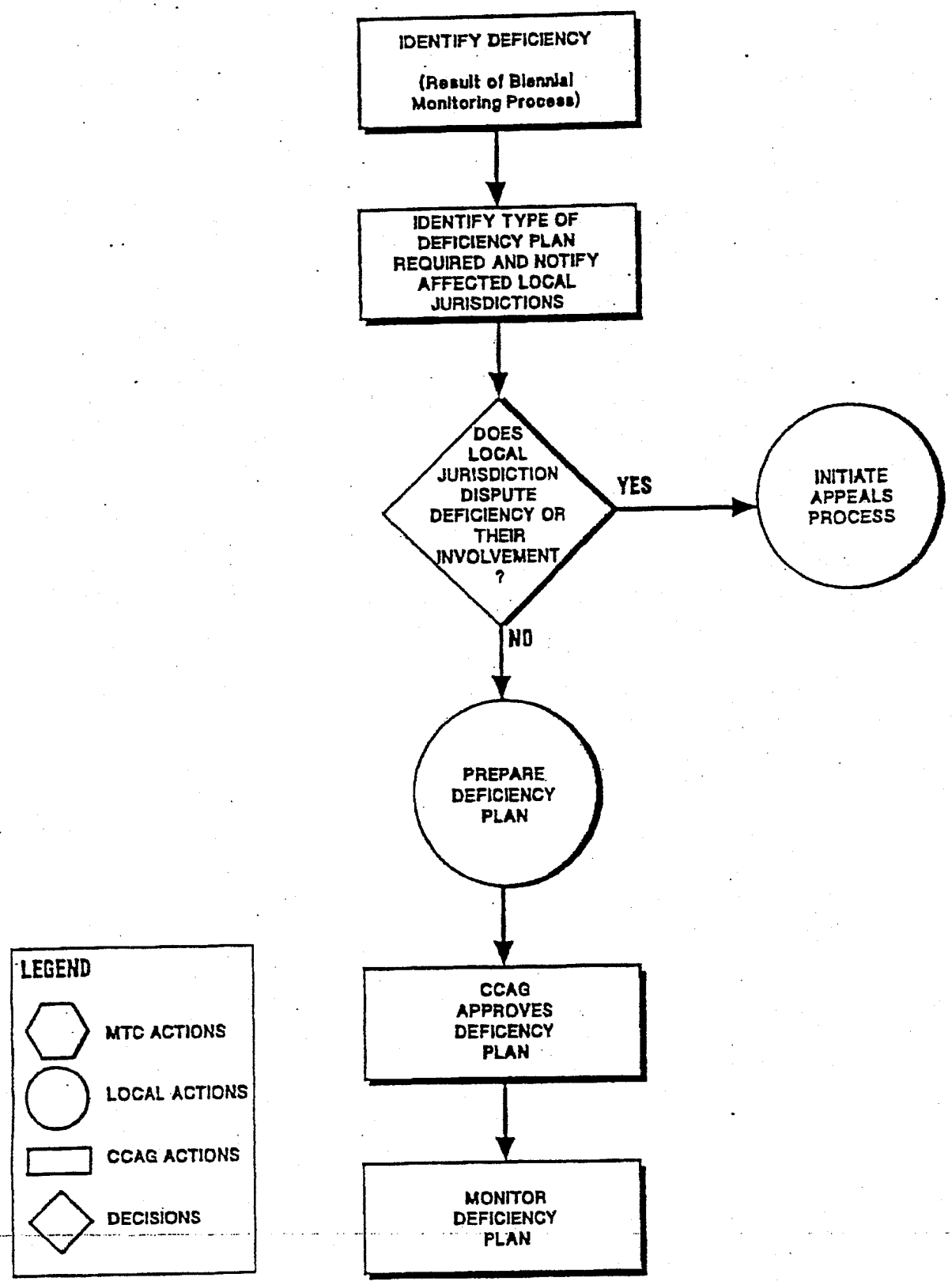


Figure 7-2

IDENTIFICATION OF DEFICIENCY AND TYPE OF DEFICIENCY PLAN

(BIENNIAL MONITORING PROCESS)

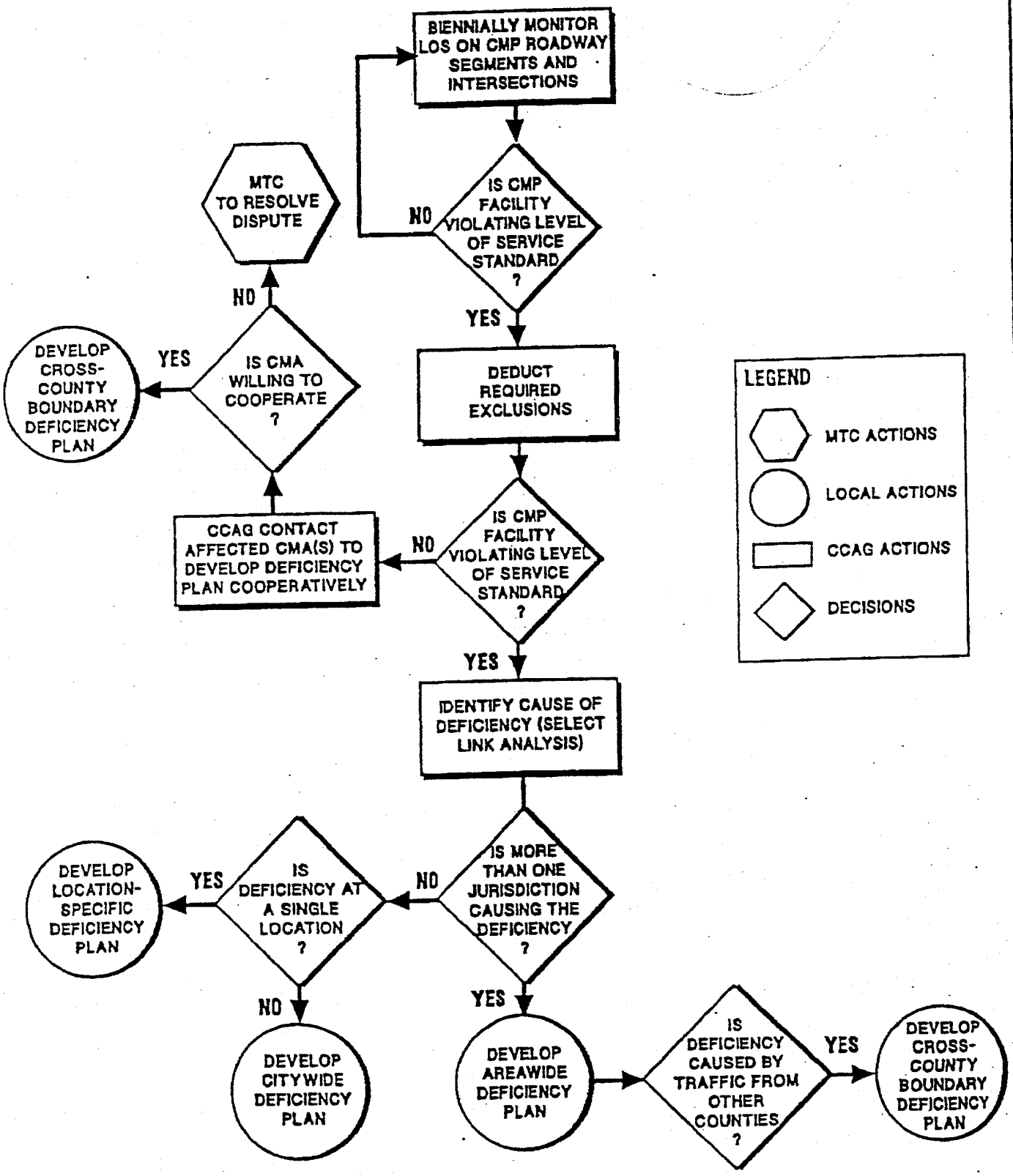


Figure 7-3

DEVELOPMENT OF LOCATION-SPECIFIC OR CITYWIDE DEFICIENCY PLAN

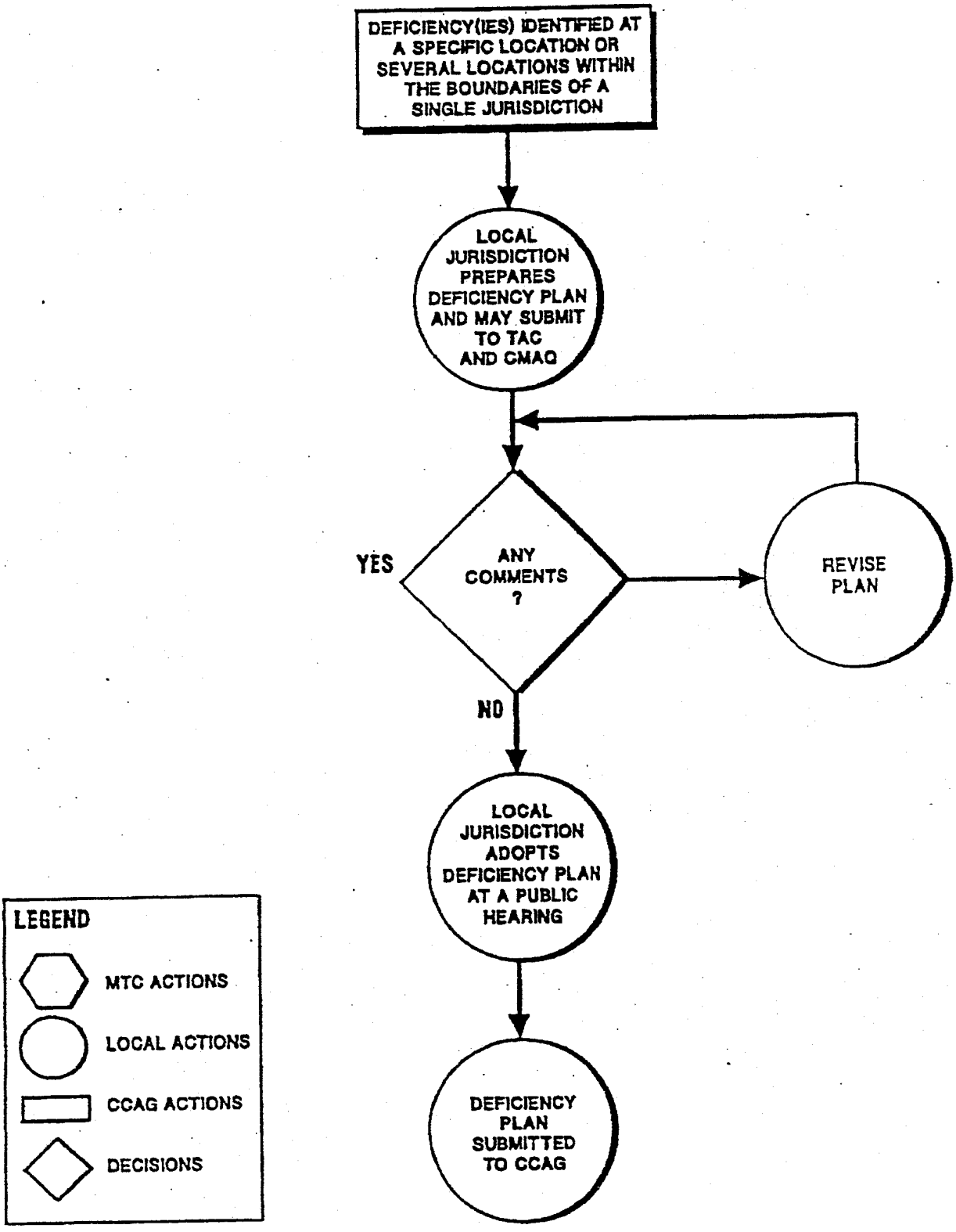


Figure 7-4

DEVELOPMENT OF AREAWIDE DEFICIENCY PLAN

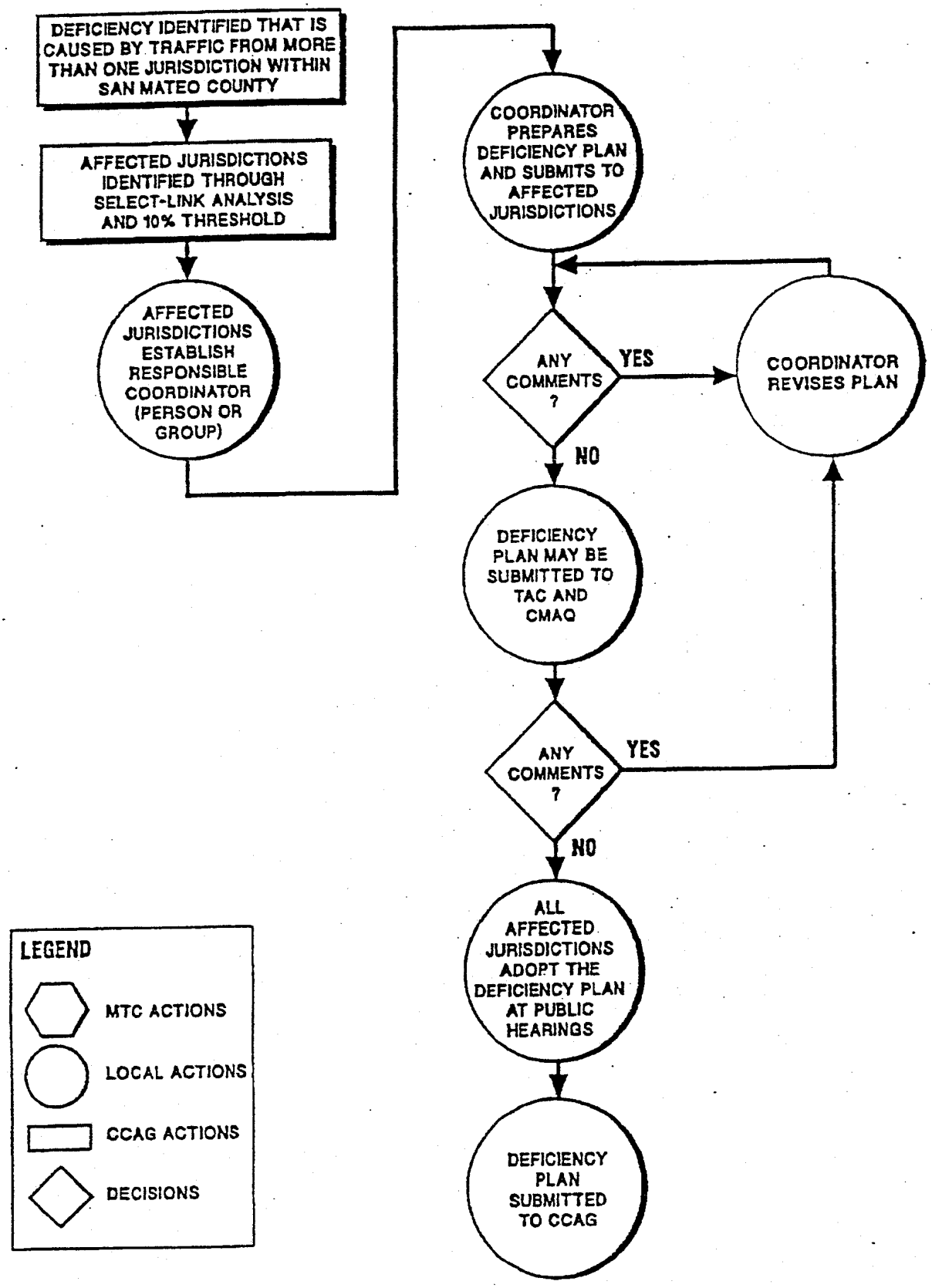


Figure 7-5

DEVELOPMENT OF CROSS COUNTY BOUNDARY DEFICIENCY PLAN

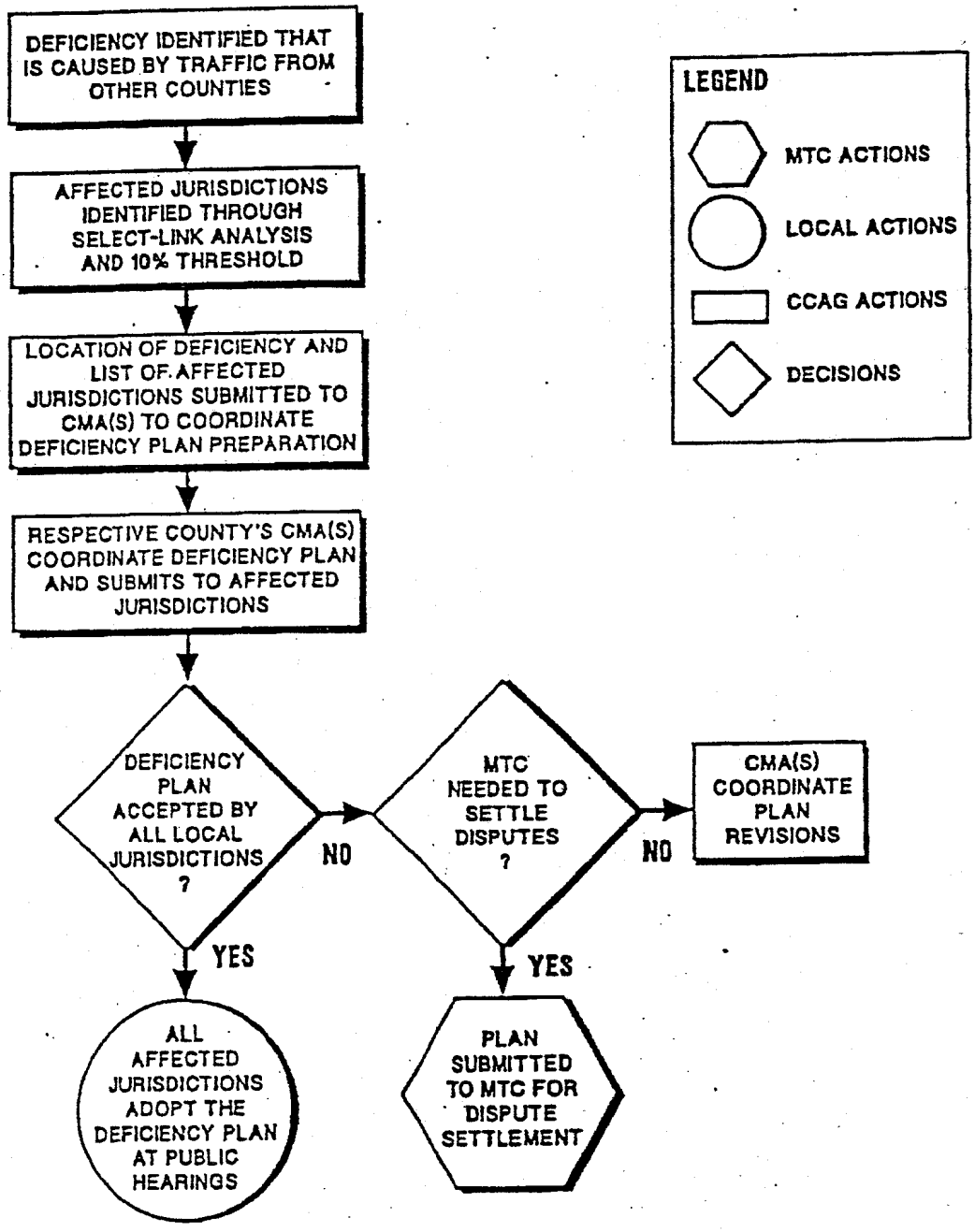


Figure 7-6 shows the process to be followed for C/CAG's approval of deficiency plans. Figure 7-7 presents the process for a local jurisdiction to appeal their involvement in a deficiency plan to C/CAG. Figure 7-8 illustrates the process for monitoring deficiency plans.

Deficiency Identification

The deficiency will be identified by the biennial level of service monitoring process (see Figure 7-2). Roadway segments or intersections on the CMP Roadway System whose existing LOS is F will be addressed in the Countywide Transportation Plan. An LOS deficiency may also be found to exist as a result of a monitoring program developed by a city or the County as part of the approval process for a local land use decision, as discussed in Chapter 6. The seven exclusions (see page 7-4) will be incorporated into the level of service calculations to determine whether a deficiency is occurring. Next, a select-link analysis will be conducted using the San Mateo Countywide Travel Demand Forecasting model to determine the origins of the traffic on the deficient roadway segments or intersections. A jurisdiction will be considered to be contributing to the deficiency if the amount of traffic at the deficiency and generated within its boundaries is greater than 10 percent of the capacity of the deficient location.[1]

If only one jurisdiction is causing the deficiency, then it can either develop a location-specific deficiency plan or a citywide deficiency plan, if there are several deficiencies within that jurisdiction. If more than one jurisdiction is causing the deficiency, either an areawide or cross-county boundary deficiency plan would be required.

Development of Deficiency Plans

The steps to develop the four types of deficiency plans are outlined on Figures 7-3 through 7-5. If a jurisdiction must prepare a deficiency plan, the draft deficiency plan must address these following points:

- Each deficiency's cause and magnitude must be described.
- Actions to be considered should include those that remedy the specific deficiency or that improve the level of service on the CMP Roadway System overall.

[1]The 10 percent of capacity threshold represents a Bay Area standard that was developed by the Bay Area CMA Association. It is based on the fact that 10 percent of capacity represents a change of one full level of service value. It was decided that if jurisdictions were contributing enough traffic to a specific location to change the level of service by one full value, then they should be required to participate in the deficiency plan preparation.

Figure 7-6

DEFICIENCY PLAN APPROVAL PROCESS

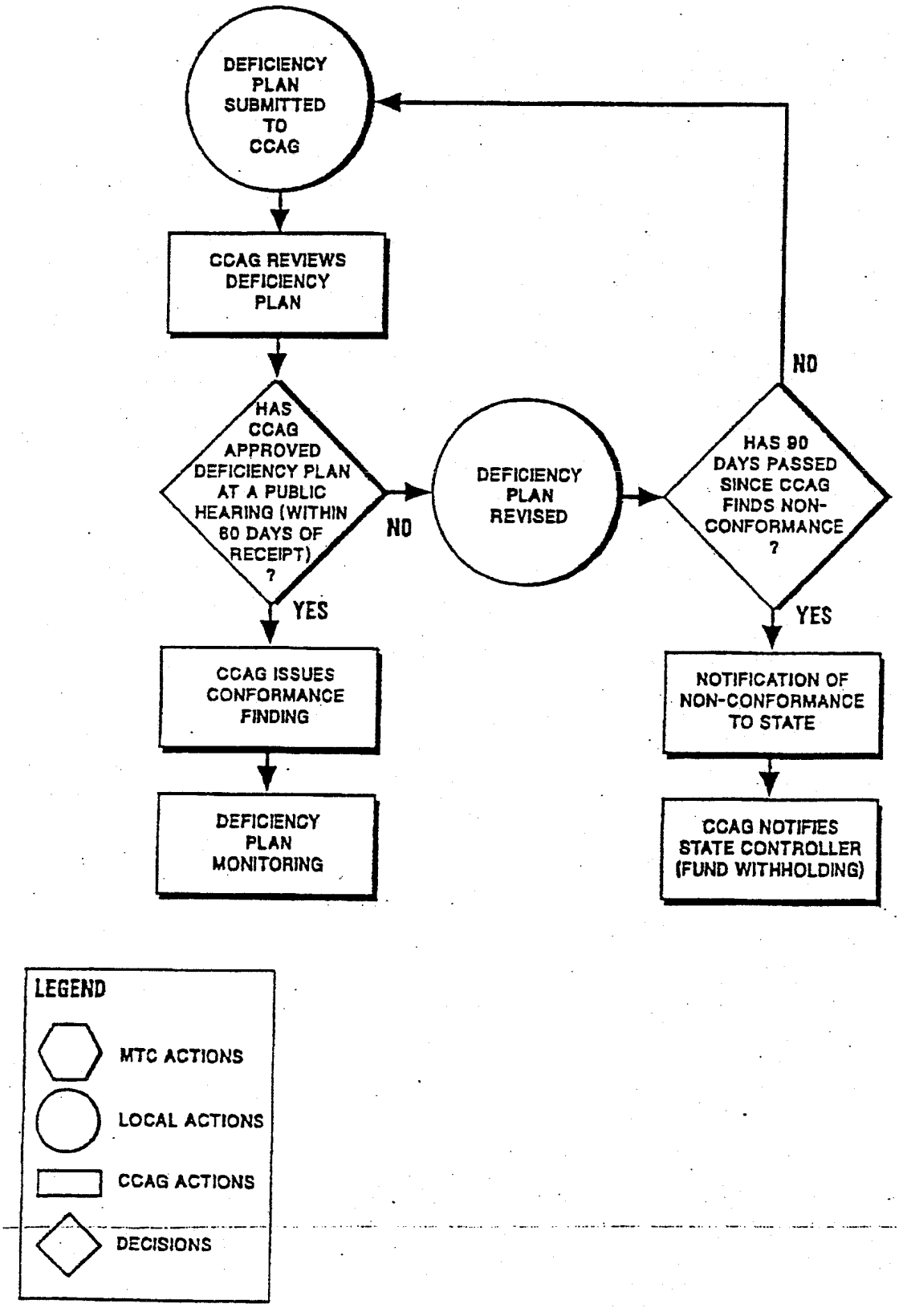


Figure 7-7

DEFICIENCY PLAN APPEALS PROCESS

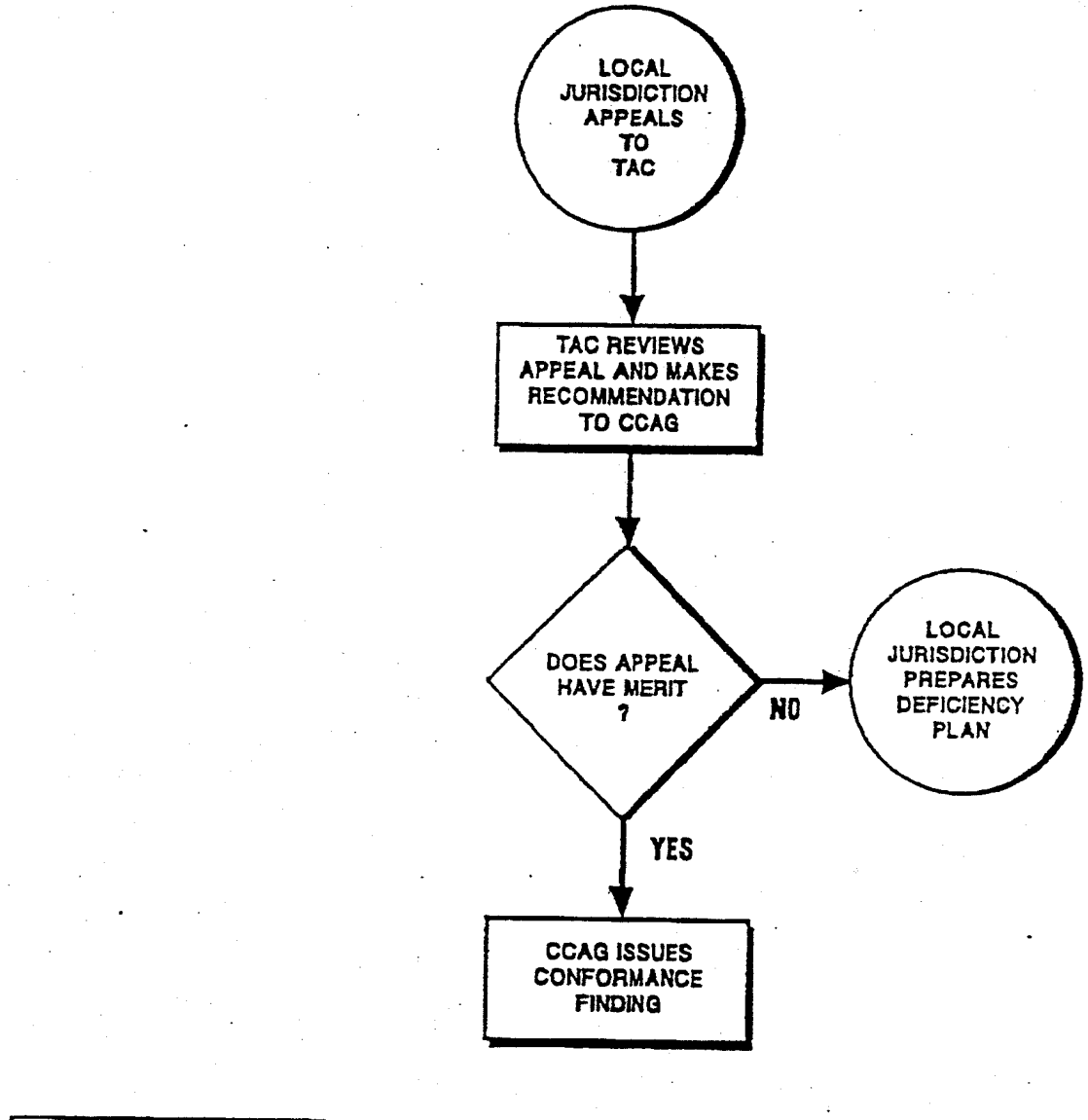
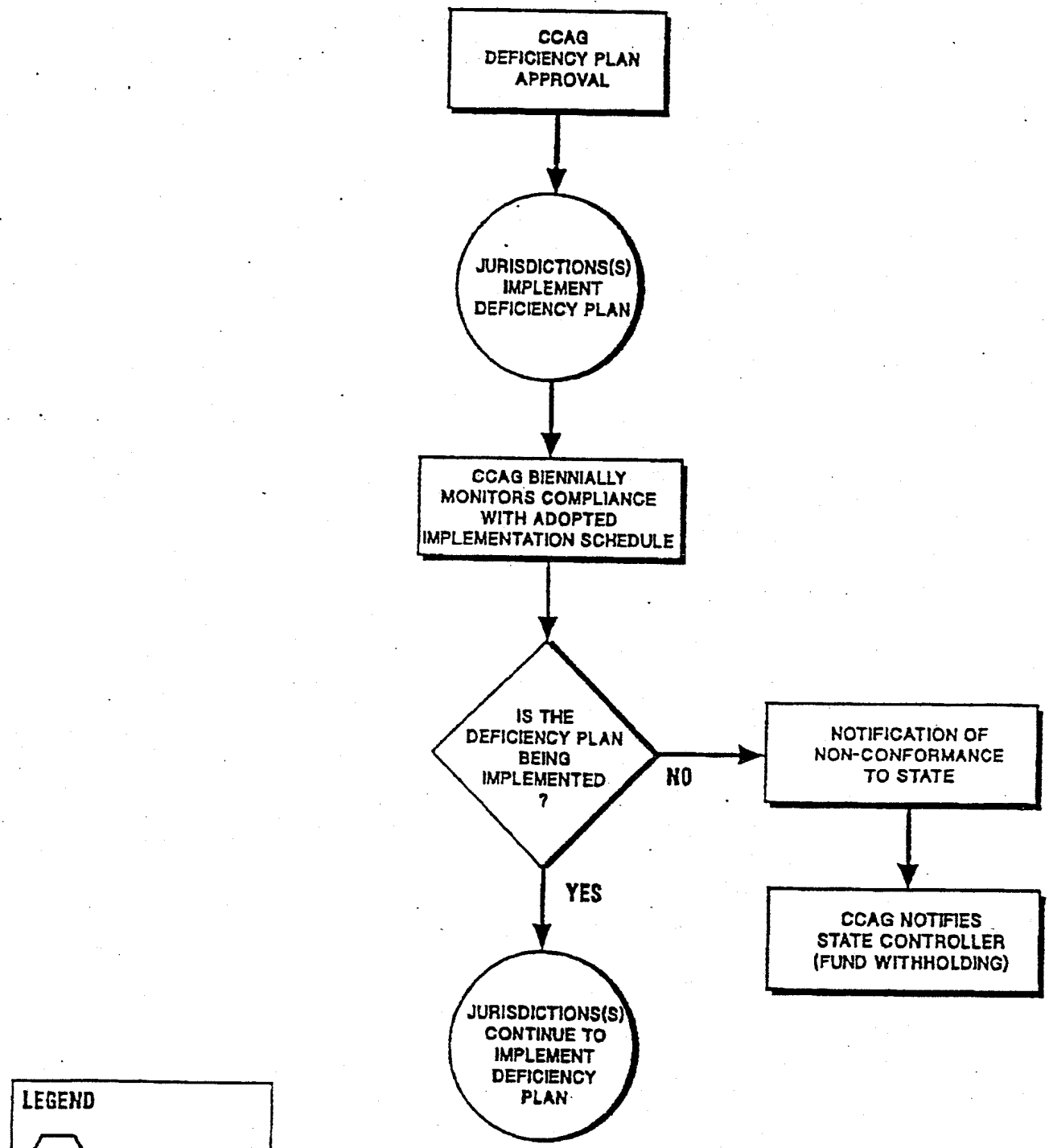


Figure 7-8

DEFICIENCY PLAN MONITORING



- If actions are considered that are intended to improve the overall LOS on the CMP Roadway System, those actions listed in the Bay Area Air Quality Management District's guidelines for deficiency plans, and other possible actions identified by affected jurisdictions and approved by the BAAQMD should be given a suitability assessment. Suitable system actions should be evaluated at a sketch-planning level in order to identify their potential effects on systemwide traffic congestion and air quality. (In some cases, traffic operations analyses or model forecasts may be required.) If this option is selected, a post implementation level of service should be established for the deficient locations, for monitoring purposes.

- A detailed action plan should be developed, including descriptions of the selected actions, anticipated costs and related funding sources, and a corresponding implementation schedule.

Deficiency Plan Approval

The activities included in the deficiency plan approval process are presented on Figure 7-6. As shown on that figure, local jurisdictions and C/CAG (and its representatives) will be responsible for ensuring that any deficiency plans that have to be prepared will meet the requirements of the CMP. Once C/CAG determines that a deficiency exists, a deficiency plan must be developed within 12 months. The jurisdictions may elect to have the TAC and CMAQ review the draft version of deficiency plans. These groups will try to resolve technical issues and will work with representatives of the local jurisdiction so that the local jurisdiction develops a deficiency plan acceptable to that jurisdiction and C/CAG.

A final deficiency plan must be adopted by the affected local jurisdiction(s) at a noticed public hearing. That public hearing must be scheduled not later than 90 days following the receipt by the local jurisdiction of C/CAG's written notification of the conformance findings.

A final plan must be approved by C/CAG. C/CAG will approve or reject a deficiency plan within 60 days of receipt of the deficiency plan from the local jurisdiction. C/CAG cannot modify a deficiency plan. If C/CAG rejects a deficiency plan, it must specify why it was rejected.

Deficiency Plan Appeals Process

The appeals process, as shown on Figure 7-7, has been added to accommodate local jurisdictions that dispute that a deficiency is occurring or that they should be involved in the development of a deficiency plan. The local jurisdiction would first make that appeal to the TAC. Information supporting their position (additional traffic counts, information refuting results of select-link analysis, etc.) should be presented. The TAC will then make a recommendation to C/CAG whether or not the appeal has merit. C/CAG will then make a decision to either uphold the appeal and issue a finding of conformance or to require the local jurisdiction to prepare or contribute to the deficiency plan.

Deficiency Plan Monitoring

Deficiency plans will be monitored biennially by C/CAG, prior to undertaking the conformance determination for the CMP, to establish whether they are being implemented according to the schedule described in their specific action elements. The monitoring process is shown on Figure 7-8.

b. Whether changes have occurred that require modifications of the original deficiency plan or schedule.

Each deficiency plan will include a schedule for implementation of the proposed actions. Compliance with the stated schedule will be monitored. A jurisdiction which is either not implementing the actions stipulated in the approved deficiency plan, or not adhering to the stated schedule, may be found by C/CAG to be in nonconformance. Once the action plan is implemented, the results of the monitoring will determine if the deficiency is still occurring. The evaluation may result in recommending changes to other elements of the CMP, such as the Capital Improvements Program (CIP) or Trip Reduction Ordinances (TROs). Action plans prepared as part of deficiency plans will be incorporated into future updates of the CMP.

Methodology

The scope of each deficiency plan's actions should match the severity of the problem being addressed. Extreme deficiencies will need more significant actions, while minor deficiencies may require the definition of only minor actions. The magnitude of the deficiency shall be influenced by the constraint(s) on capacity that prevent(s) a roadway or intersection from operating at its appropriate level of service.

Actions to resolve problems will fall into one of the following two categories: improvements designed to directly mitigate the specific deficiency, and improvements designed to improve the overall level of service on the CMP Roadway System and provide air quality improvements. Actions of the first type are intended to directly mitigate a deficiency. These include highway, transit, and transportation system improvements. Actions of the second type are intended to provide measurable improvements to air quality and level of service on the CMP Roadway System in cases where deficiencies on specific segments or at specific intersections cannot be mitigated directly. For these types of situations, the Bay Area Air Quality Management District has developed a list of available deficiency plan actions which are considered beneficial for air quality and congestion management. Jurisdictions may include actions other than those on this list, provided that they are reviewed and approved by the BAAQMD prior to adoption of the local deficiency plan. However, C/CAG has ultimate approval of the specific actions included in a deficiency plan.

When developing a deficiency plan, the most current BAAQMD list of actions must be considered. The current list was adopted by the BAAQMD on November 4, 1992, and is contained in Appendix C.

Deficiency plans should contain the following sections:

Introduction and Setting--a short description of the deficient roadway facility, including a map showing its location.

Deficiency Analysis--an explanation of the likely causes of the deficiency, and a quantitative assessment of the magnitude of the deficiency.

Improvement List--a list of the improvements necessary for the deficient segment or intersection to maintain (or attain) the Level of Service Standard and the estimated costs of the improvements.

Action List (Screening of Actions)--a listing of possible actions and a sketch-planning level evaluation of the most suitable actions.

Implementation Plan--a description of the actions proposed for implementation, their costs, a schedule for their implementation and completion, and the definition of responsible parties.

Monitoring Program--a description of the steps that the jurisdiction preparing the deficiency plan will take to monitor implementation of the actions included in the plan.

APPENDIX E

Descriptions of Transportation Control Measures (TCM)

appendix three

transportation control measures

Transportation Control Measures (TCMs) are strategies to reduce vehicle emissions. The federal TCMs shown below were added over successive revisions to the State Implementation Plan (SIP). With the exception of the five new TCMs (A-E), the original set of 28 TCMs has been completed.

Federal TCMs in the State Implementation Plan

TCM Number	Federal Transportation Control Measure
Original TCMs from 1982 Bay Area Air Quality Plan	
TCM 1	Reaffirm commitment to 28 percent transit ridership increase between 1978 and 1983
TCM 2	Support post-1983 improvements in the operators' five-year plans and, after consultation with the operators, adopt ridership increase target for the period 1983 through 1987
TCM 3	Seek to expand and improve public transit beyond committed levels
TCM 4	High-occupancy-vehicle (HOV) lanes and ramp metering
TCM 5	Support RIDES efforts
TCM 6*	Continue efforts to obtain funding to support long-range transit improvements
TCM 7	Preferential parking
TCM 8	Shared-use park-and-ride lots
TCM 9	Expand commute alternatives program
TCM 10	Information program for local governments
TCM 11**	Gasoline Conservation Awareness Program (GasCAP)
TCM 12**	Santa Clara County commuter transportation program
Contingency Plan TCMs Adopted by MTC in February 1990 (MTC Resolution 2131)	
TCM 13	Increase bridge tolls to $1.00 on all bridges
TCM 14	Bay Bridge surcharge of $1.00
TCM 15	Increase state gas tax by 9 cents
TCM 16*	Implement MTC Resolution 1876, Revised — New Rail Starts
TCM 17	Continue post-earthquake transit services
TCM 18	Sacramento-Bay Area Amtrak service
TCM 19	Upgrade Caltrain service
TCM 20	Regional HOV System Plan
TCM 21	Regional transit coordination

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* Deleted by EPA action from 1999 Ozone Attainment Plan

** Deleted by EPA action from 1999 Ozone Attainment Plan, but retained in Carbon Monoxide Maintenance Plan

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TCM Number	Federal Transportation Control Measure
TCM 22	Expand Regional Transit Connection ticket distribution
TCM 23	Employer audits
TCM 24	Expand signal timing program to new cities
TCM 25	Maintain existing signal timing programs
TCM 26	Incident management on Bay Area freeways
TCM 27	Update MTC guidance on development of local Transportation Systems Management (TSM) programs
TCM 28	Local TSM Initiatives

New TCMs in 2001 Ozone Attainment Plan (Being Implemented)

TCM A	Regional Express Bus Program
TCM B	Bicycle/Pedestrian Program
TCM C	Transportation for Livable Communities
TCM D	Expansion of Freeway Service Patrol
TCM E	Transit access to airports

The 19 proposed state Transportation Control Measures (TCMs) in the Draft 2005 Bay Area Ozone Strategy have been updated pursuant to the requirements of the California Clean Air Act (CCAA). The proposed TCMs include transit service improvements, rideshare programs, bicycle and pedestrian enhancements, and land-use, pricing, and traffic management strategies. The implementation steps outlined for each TCM include both near-term and long-term implementation. A full description of these state TCMs will be included in the *Draft 2005 Bay Area Ozone Strategy* publication, available in Summer 2005.

State TCMs Proposed in the Draft 2005 Bay Area Ozone Strategy

TCM Number	State Transportation Control Measure	Implementation Steps
TCM 1	Support voluntary employer-based trip reduction programs	• Provide core support for employer programs, based on an assessment of employer needs and the level of employer interest. Potential support includes assistance in developing or enhancing employer programs, information and referrals, employer networks, and programs to recognize outstanding employer programs. • Support legislation to maintain and expand incentives for employer programs, such as tax deductions and/or tax credits for employer efforts to promote ridesharing, transit, and other commute alternatives • Seek legislation to create stronger voluntary programs for all employers or to require certain minimum elements for public employers
TCM 2	Adopt employer-based trip reduction rule	*TCM deleted* — Health and Safety Code Section 40929 does not permit air districts to require mandatory employer-based trip reduction programs.
TCM 3	Improve local and areawide bus service	• Replace worn-out transit buses with clean-fuel buses and retrofit existing diesel buses with diesel emission control technology • Sustain the existing Regional Express Bus Program • Assist further planning work on enhanced bus and Bus Rapid Transit concepts • Sustain transit service to airports • Restore local bus routes that were eliminated due to economic recession • Implement new Enhanced Bus and Bus Rapid Transit services and additional Lifeline Transit services, and expand of Regional Express Bus Programs as funds become available
TCM 4	Upgrade and expand local and regional rail service	• Upgrade and expand local and regional rail service • Implement MUNI Metro Third Street Light Rail initial operating segment from Downtown SF to Hunter's Point • Implement Caltrain Express/Rapid Rail Phase 1 ("Baby Bullet") to San Francisco • Extend Tasman East and Vasona light-rail transit (LRT) in Santa Clara County • Extend BART to Warm Springs, eBART to Eastern Contra Costa County, tBART to Livermore/Amador Valley and implement Silicon Valley Rapid Transit Corridor and an Oakland International Airport connector • Implement MUNI Metro Central Subway in San Francisco • Implement Caltrain Downtown Extension/rebuild TransBay Terminal • Implement Downtown East Valley LRT in Santa Clara County • Implement new Marin/Sonoma Commuter Rail Service between Cloverdale and a San Francisco-bound ferry service • Implement an additional Capitol Corridor peak-period commuter service between Vacaville and Oakland • Implement Dumbarton Rail Service connecting BART and Caltrain over a rebuilt Dumbarton rail bridge
TCM 5	Improve access to rail and ferries	• Develop demonstration program for station car and bike station concepts at select regional transit centers • Determine long-term funding needs for existing shuttles and examine funding options • Implement Safe Routes to Transit to improve bicycle and pedestrian access • Complete Regional Transit Connectivity Plan • Develop a master plan for innovative secure bicycle storage strategies at key transit hubs

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TCM Number	State Transportation Control Measure	Implementation Steps
TCM 6	Improve interregional rail service	• Implement additional interregional rail service in Capitol (Auburn–Sacramento–Oakland–San Jose) Corridor and track enhancements • Implement additional Altamont Corridor Express rail service and track enhancements • Implement high-speed rail service between Los Angeles and the Bay Area
TCM 7	Improve ferry service	• Conduct initial planning for new ferry service • Implement new high-speed low emission ferry to service Vallejo to San Francisco route • Expand existing ferry service between: Oakland/Alameda and San Francisco, and Larkspur and San Francisco • Implement new ferry service between Berkeley/Albany and San Francisco, and South San Francisco and San Francisco • Implement new intermodal transit hub at Vallejo Ferry Terminal • Expand berthing capacity at the San Francisco Ferry Terminal • Implement hydrogen fuel cell ferry demonstration project from Treasure Island to San Francisco • Assist ferry operators in converting vessel engines to lower emission engines • Study and potentially implement new service between Richmond, Hercules/Rodeo, Martinez, Redwood City and San Francisco; Port Sonoma and San Francisco; and Oakland and San Francisco airports
TCM 8	Construct carpool/express bus lanes on freeways	• Expand existing HOV network, based on 2003 Transportation Improvement Program, where beneficial to air quality. Special attention should be paid to express bus operations to maximize benefits for transit. Monitor and adjust occupancy requirements and hours of operation to maximize air quality and mobility benefits. • Implement HOV support facilities such as park & ride lots at various locations • Implement additional HOV lanes and support infrastructure identified in the Regional Transportation Plan, where beneficial to air quality
TCM 9	Improve bicycle access and facilities	• Fund Regional Bicycle Plan and Safe Routes to Transit improvements • Continue Transportation Development Act (TDA) Article 3, Transportation for Livable Communities (TLC) and Transportation Fund for Clean Air (TFCA) funding for bike improvements • Develop on-line bicycle mapping tool as part of the regional 511 traveler information number • Promote Bike to Work Week/Day • Encourage local jurisdictions to develop safe and convenient bicycle lane and route networks, provide secure bike racks and storage, and require bicycle access and amenities as conditions of approval of development projects • Encourage public education about bicycle safety for both bicyclists and motorists
TCM 10	Youth transportation	• Encourage walking and bicycling to school through the Safe Routes to Schools Program • Establish special carpool formation services for parents, students and staff at Bay Area elementary and secondary schools • Replace school buses with clean-fuel vehicles • Offer transit ride discounts to youth and students
TCM 11	Install freeway traffic management systems	• Integrate traffic management features into new freeway construction projects • Maintain current level of Freeway Service Patrol (FSP) • Maintain 511 transit information service and improve and customer convenience • Extend ramp metering in major freeway corridors • Seek funding for full deployment of Caltrans' Traffic Operation System/Traffic Management Center project • Expand FSP to other routes and times of the day
TCM 12	Arterial management measures	• Maintain current technical assistance program for local jurisdictions that seek to retime signals, including the evaluation of bus priority treatments • Continue TFCA program to fund arterial management projects where air quality benefits can be demonstrated • Coordinate the timing of an additional 1,200 signals and continue updating timing plans • Work with bus operators to provide priority treatment along major bus routes

TCM Number	State Transportation Control Measure	Implementation Steps
TCM 13	Transit use incentives	• Implement Translink® (universal fare card) on transit systems throughout the region • Implement improvements to the 511 transit information service • Encourage employers, transit operators, local governments and others to promote and expand employer-based transit subsidy programs like the Commuter Check and EcoPass programs • Improve signage at transit transfer hubs • Deploy real-time transit arrival information • Increase passenger amenities at transit hubs and stops • Complete Alameda and Contra Costa County transit centers identified in AC Transit's Comprehensive Service Plan
TCM 14	Carpool and vanpool services and incentives	• Maintain current programs of the Regional Ridesharing Program and increase efficiency in delivering services • Explore innovative concepts such as real-time ridematching and more formal pick-up/drop-off locations for casual carpoolers • Explore options for expanding medium-distance (15–30 miles) vanpools
TCM 15	Local land-use planning and development strategies	MTC will: • Implement its 5-point transportation and land-use platform including a new planning grant program to fund station area plans around major transit facilities • Maintain funding for expanded TLC planning and capital grant programs and HIP program • Continue providing Transportation Planning and Land-Use Solutions (T-PLUS) funding to congestion management agencies to promote community revitalization projects • Utilize a Caltrans grant to examine opportunities for transit-oriented development along major transit corridors • Develop incentives and conditions to promote supportive land use policies around major new transit investments BAAQMD will: • Continue to fund bicycle projects, traffic-calming, shuttles, low emission vehicles, trip reduction programs and other clean air projects through the TFCA program • Continue to provide technical assistance to local jurisdictions on air quality analyses in the environmental review process • Continue to encourage cities and counties to reduce emissions from sources other than motor vehicles including lawn and garden equipment, wood stoves and fireplaces, and residential and commercial uses ABAG will: • Periodically monitor and update its Smart Growth demographic projections • Promote multi-jurisdiction planning along select transit corridors to encourage transit-oriented development MTC, ABAG and the BAAQMD will: • Develop financial and other incentives and technical assistance to encourage innovative parking strategies such as reduced parking, parking fees, parking cash-out, shared parking and other parking programs • Pursue legislative changes to remove barriers and provide incentives for smart growth • Promote carsharing as a way to reduce parking requirements • Monitor indirect source mitigation programs in other regions for Bay Area feasibility • Provide technical assistance to local government agencies • Publicize noteworthy examples of local clean air plans, policies and programs, as well as endorse noteworthy development projects • Study opportunities to promote location efficient mortgages (LEMs) to encourage home purchases near transit

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TCM Number	State Transportation Control Measure	Implementation Steps
TCM 16	Public education/ intermittent control measures	• Continue Spare the Air (STA) notices to media, employers, public agencies and individuals, with an emphasis on reactive organic gases (ROG) reductions, obeying freeway speed limits in electronic freeway signs and other outreach efforts • Expand STA notices to add emphasis on ROG reductions, obeying freeway speed limits, and discouraging use of pleasure craft • Expand the Clean Air consortium to include cities and counties, as well as other public agencies • Target major commercial airports and their tenants for greater participation in the STA program • Increase coordination between the Bay Area's STA program with the San Joaquin Valley's STA program • Continue public education program on the proper maintenance and operation of motor vehicles to reduce air pollution • Study effectiveness and costs of free transit on Spare the Air days • Explore possible legislative approaches to formalize and strengthen episodic approaches
TCM 17	Conduct demonstration projects	• Promote demonstration projects to develop new strategies to reduce motor vehicle emissions. Potential projects include: – Low and zero emission vehicles (LEV) and refueling infrastructure – Parts replacement program for middle-aged cars – Heavy duty diesel vehicle idling – Carsharing • Monitor Phase 1 projects and expand depending on effectiveness and resources available
TCM 18	Implement transportation pricing reform	• Advocate for legislative authority to develop and promote revenue measures for: – Congestion pricing on bridges – High-occupancy/toll lanes – Regional and state gas tax increases of up to $.50 per gallon – Regional vehicle miles traveled (VMT) fees – Taxes on diesel fuel – Emissions-based vehicle registration fees
TCM 19	Improve pedestrian access and facilities	• Review and comment on general/specific plan policies to promote development patterns that encourage walking and circulation policies. Emphasize pedestrian travel and encourage amending zoning ordinances to include pedestrian-friendly design standards. • MTC will continue to fund local pedestrian improvement projects through the TLC program, and support the Pedestrian Safety Task Force and associated pedestrian safety programs. • TFCA program will continue to fund pedestrian improvement projects to reduce motor vehicle trips and emissions. • Continue to identify and fund planning projects that enhance pedestrian movement in neighborhoods, downtowns and near transit stops • Continue funding specific improvements through a variety of funding sources • Support Safe Routes to Schools
TCM 20	Promote traffic-calming measures	• Promote traffic-calming measures • Fund traffic-calming projects such as pedestrian-exclusive streets, residential and neighborhood traffic calming measures, and arterial and major route traffic-calming measures • Include traffic-calming strategies in the transportation and land use elements of general and specific plans • Encourage area-wide traffic-calming plans and programs • Include traffic-calming strategies in capital improvements programs

APPENDIX F

2011 CMP Monitoring Report

Submitted to:

C/CAG
City/County Association of Governments of San Mateo County

Level of Service and Performance Measure Monitoring Report - 2011

September 19, 2011

Submitted by:

JACOBS™
300 Frank H. Ogawa Plaza, Suite 10
Oakland, CA 94612

JACOBS

September 19, 2011

City/County Association of Governments of San Mateo County
County Office Building
555 County Center
Fifth Floor
Redwood City, California 94063
Attention: John Hoang, Program Manager

Re: Level of Service and Performance Measure Monitoring Report - 2011

Dear Mr. Hoang:

Jacobs Engineering Group Inc. (Jacobs) is pleased to submit the report for the 2011 LOS and Performance Measure Monitoring to support of the 2011 Congestion Management Program for the City/County Association of Governments of San Mateo County (C/CAG).

Jacobs conducted the 2011 study for C/CAG utilizing the latest technology for performing CMP studies. Our extensive and unique experience provides a cost-effective and cutting edge process to obtain and analyze traffic data. Jacobs has developed a methodology including GPS and GIS over the past 10 years with exciting results. The addition of the GIS linear reference system has added a component that has never before been applied to network analyses. For the first time, C/CAG now has an extensive database integrated in GIS for easy access and historic comparisons.

C/CAG has taken a major step forward in having the ability to take the GIS data, in addition to the historic tables, and integrate the digital data with your travel demand model. The speeds, roadway attributes, etc can be conflated with the model to produce a very robust and comprehensive system. This was not available in the past because the methodology used with tables and charts did not produce the value added products of this 2011 study. Jacobs will continue to support C/CAG to produce the best value that not only meets the intended LOS monitoring requirements to allow historic comparisons of this project, but produces the results in a form that can be used by many other areas within the county and by its members.

Sincerely,
Jacobs Engineering Group Inc.

Steve T. Taylor, P.E., PTOE
Project Manager

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A. EXECUTIVE SUMMARY

The City/County Association of Governments of San Mateo County (C/CAG) has an established Congestion Management Program (CMP) to monitor the transportation network within the county. All roadways included in the CMP network are evaluated for conformity at least every two years.

The goal of the monitoring program is to improve the performance of the transportation system by identifying congested areas and related transportation deficiencies. This information is then used to help prioritize transportation funding decisions based on system performance, land use factors, multimodal characteristics, and other considerations.

This year's monitoring study was conducted in the spring 2011 with data collection between April and May including travel time runs on approximately 163.3 directional miles of freeways and arterials, 72-hour counts on 23 segments representing 301.4 centerline miles of arterials, and 16 intersection turning movement counts.

This is the first monitoring cycle during which the C/CAG has used Global Positioning System (GPS) technology integrate in a geographic information system (GIS) to monitor Level of Service (LOS) on the CMP network. The primary tasks completed as part of this study include:

- Mapping of the CMP network
- Travel time data collection
- LOS Analysis

With the 2011 monitoring cycle, C/CAG is calculating LOS based on two methodologies—Highway Capacity Manual (HCM) 1994 and HCM 2000. This dual reporting facilitates historical comparisons while also reporting LOS based on the more current methodology. For freeways, only HCM 1994 LOS is reported, as the HCM 2000 methodology requires traffic volume information for all unique freeway segments and ramps. The HCM 2000 criteria was used only for the intersection LOS using the collected peak period turning movement counts analyzed in Synchro. Collection of comprehensive freeway traffic volumes is beyond the scope of the CMP monitoring effort. By HCM 1994 standards, only one official freeway segment evaluated during the PM peak period was found to operate at LOS F. That segment is SR 92 between I-280 and US 101.

With the introduction and use of GIS, included in this years monitoring report, comes the ability to determine LOS for various smaller intersection segments and not only the longer summary segments as determined in the past. Intersection segment results were also calculated in addition to the (generally longer) official CMP segment results. By subdividing the CMP segments into intersection-level results, localized congestion can be quickly identified along the route segment. This helps identify locations of intense congestion. Improvements such as traffic signal upgrade/coordination, dedicated transit lanes, access management, and/or pedestrian and bicycle improvements could be considered for the intersection segments that exhibit high degrees of localized traffic congestion.

B. INTRODUCTION

History of the Congestion Management Program

C/CAG has an established Congestion Management Program (CMP) to monitor the transportation network within the county. All roadways included in the CMP network are evaluated for conformity at least every two years by the agency, which is the designated Congestion Management Agency (CMA) for San Mateo County. The goal of the monitoring program is to improve the performance of the transportation system by identifying congested areas and related transportation deficiencies. This information is then used to help prioritize transportation funding decisions in light of system performance, land use factors, multimodal characteristics, and other considerations.

This year's study was conducted in the spring of 2011 with travel time runs between April and May of 2011. The most recent assessment prior to this study was performed in March 2009. The primary tasks completed as part of this study include:

- Mapping of the CMP network
- Travel time data collection
- Level of Service Analysis

Study Background

This year's monitoring study was conducted in the spring 2011 with data collection between April and May including travel time runs on approximately 163.3 directional miles of freeways and arterials, 72-hour counts on 23 segments representing 301.4 centerline miles of arterials, and 16 intersection turning movement counts. CMP legislation requires that state highways (including freeways) and principal arterials be included in the CMP network. The network must be useful to track the transportation impacts of land development decisions, as well as to help assess the congestion management implications of proposed transportation projects. C/CAG's network therefore includes numerous local thoroughfares since most urban traffic occurs on city arterials (rather than on the freeways). **Figure 1** shows the routes that were monitored.

All of the study roadways were evaluated during the AM and PM peak period between the hours of 7 AM - 9 AM and 4 PM - 7 PM. As in previous studies, both time periods are considered when determining the LOS to be reported. The directionality of the segment is not reported in many of the summary tables, but the worst LOS found for either direction for either AM or PM peak period is shown as the official result. In most cases, the PM period is the focus of the CMP since consistently, the PM period results in higher volumes, slower speeds, and more congestion. The methodology used included performing floating car travel time studies, 72-hour traffic counts, and intersection turning movement counts.

The total directional miles and number of route segments for each roadway type are shown in **Table 1**.

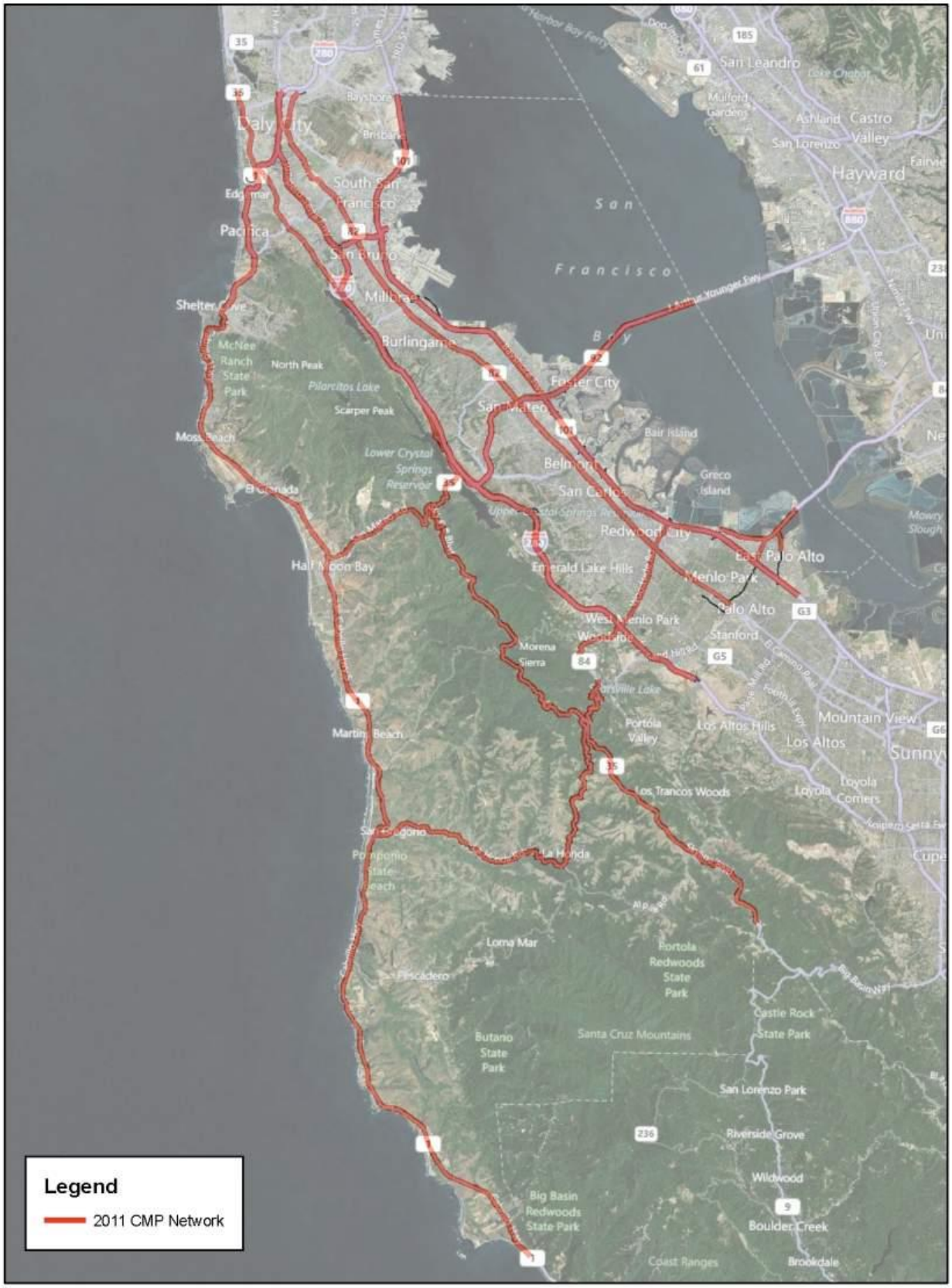


Figure 1 – Spring 2011 CMP Monitored Routes

Table 1 – Total Study Miles Summary

Roadway Type	Total Directional Miles
Arterial / State Routes	301.4
Freeway	163.3
Total	464.7

This monitoring report focused on the five performance measures established in the San Mateo County Congestion Management Program. These performance measures are:

1. Roadway Level of Service
   a: Travel Time – Average Speed
   b. 72-hour traffic counts – V/C for rural arterials
2. Intersection LOS
3. Travel Time for various modes (single occupant, carpools, and transit)
4. Pedestrian and Bicycle Improvements
5. Ridership / Person Throughput for Transit

As noted, the "Roadway Level of Service and Intersection LOS" are the primary CMP performance measures; therefore, a mitigation plan is required if the resulting LOS is below the established minimum standard.

The following sections focus on each of the above performance measures with emphasis on the Roadway and Intersection LOS. The other items are included to provide some alternative views to help explain the changes in performance and the opportunities for improvement.

C. METHODOLOGY

Mapping of CMP Network

Global Positioning System (GPS)

Historically, CMP travel time runs were done manually. Jacobs introduced the use of GPS and GIS to C/CAG in 2011. In general, the equipment used by Jacobs received consistent GPS signals across the County.

Before performing the travel time runs, all roadways were mapped using GPS technology. The Haicom-BT Bluetooth receiver was mounted on a vehicle and used in the mapping. The receiver uses differential GPS (DGPS) to provide position information to sub-meter accuracy. These receivers were used in combination with the controlling software developed by Jacobs while driving each roadway to inventory all roadway attributes related to speed.

The data collection process was made more efficient by collecting data electronically using GPS technology. The methodology provided C/CAG with background mapping and traffic-related elements that can be integrated with the agency's GIS/travel demand model for future use.

Mapping Runs

The roadway mapping was done in-vehicle using the Haicom-BT GPS equipment and software. Mapping was done in one direction for each roadway segment during off-peak periods.

Certain traffic elements were recorded such as the posted speed limit, presence of traffic signals, number of through lanes, and construction areas. This information could be used later to determine the segment lengths and theoretical travel times, and to provide better insight into the resulting travel time runs.

Video on Mapping Runs

The roadway segments were videotaped during the mapping process in order to provide a reference of the conditions. The digital videos were later linked to the GIS results for future reference. This provides a video log of the CMP network roadways. These video logs can be invaluable for future tasks such as asset management where all traffic items can easily be viewed.

Travel Time Data Collection

Travel time runs were conducted using the floating car method. In the floating car method, the driver of the test vehicle "floats" with the traffic to represent the average vehicle by attempting to safely pass as many vehicles that pass the test vehicle.

Travel time runs were conducted during the morning and afternoon peak periods on all roadway segments; runs were only conducted on Tuesdays, Wednesdays, or Thursdays, and school district spring break periods were avoided. A minimum of five (5) runs were made in each direction during each peak period. During the travel time runs, the Haicom BT GPS equipment recorded position and time at one-second intervals into a Dell Personal Digital Assistant (PDA) using Bluetooth technology. The driver of the test vehicle drove the speed limit if no other cars were present and at the school zone speed limit if a school zone speed limit was in effect at the time of the travel time run.

D. EVALUATION

LOS Analysis – HCM 1994

The tables in the Appendix highlight the 2011 CMP route segments that had LOS lower than the established standard during the AM or PM Peak by HCM 1994 standards directly from the travel time runs or 72-hour counts. The CMP enabling legislation allows for the reduction in volume for those interregional trips for those segments that have a LOS lower than the established standard; i.e. those trips that originate from outside the county and either pass through the county or have a destination within San Mateo County.

Other Performance Measures Results

Apart from average speeds aggregated to the CMP route segments level, intersection segment level average speeds were also calculated in 2011 for all routes. These results are available in the GIS tables provided to C/CAG.

An example from the 2011 monitoring cycle that illustrates the utility of Intersection Segment level results is presented here. The segments included as official CMP segments are illustrated in **Figure 2**. If the analysis focused only on these segments, much of the corridors highlighted would be missed. Historically, the surface streets have not been evaluated using travel time runs. The performance review has focused either on the traffic counts at various intersections or on link 72-hour traffic counts on the rural arterials. For demonstration this year, travel time runs were completed on SR 82 (El Camino Real) in addition to the intersection turning movement counts. **Figure 3** illustrates the benefit of this methodology to highlight the delays that occur at the local level and may not be reflected in the results when only relying on the traffic counts. The intersections have been evaluated only on an isolated level and consideration was not given for the benefits of coordinate signal timing. Travel time runs when illustrated in GIS, paint a clear picture as to the efficiency of the existing signal timing for progression.

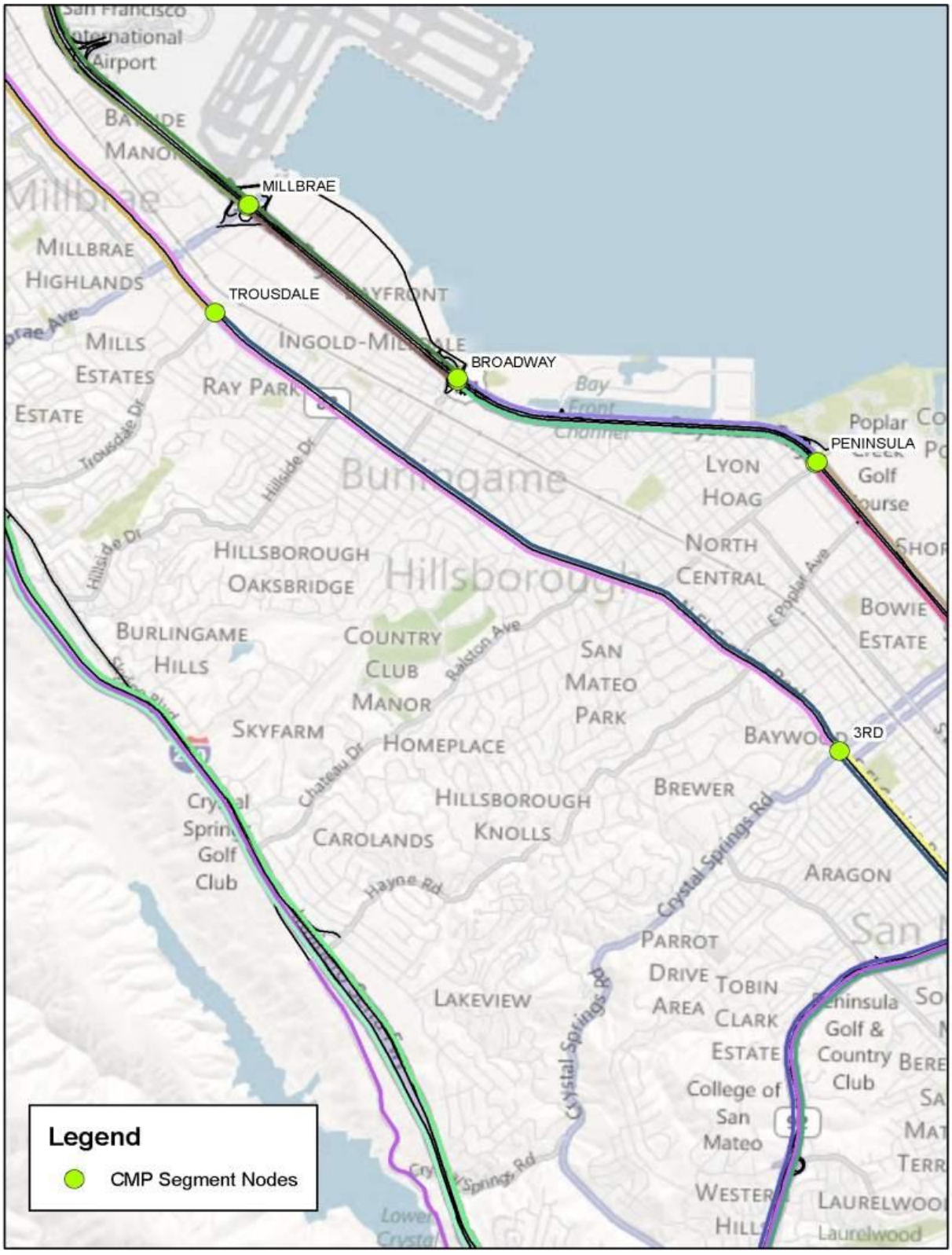


Figure 2 – Example CMP Segment – SR 82 between 3rd Street and Trousdale

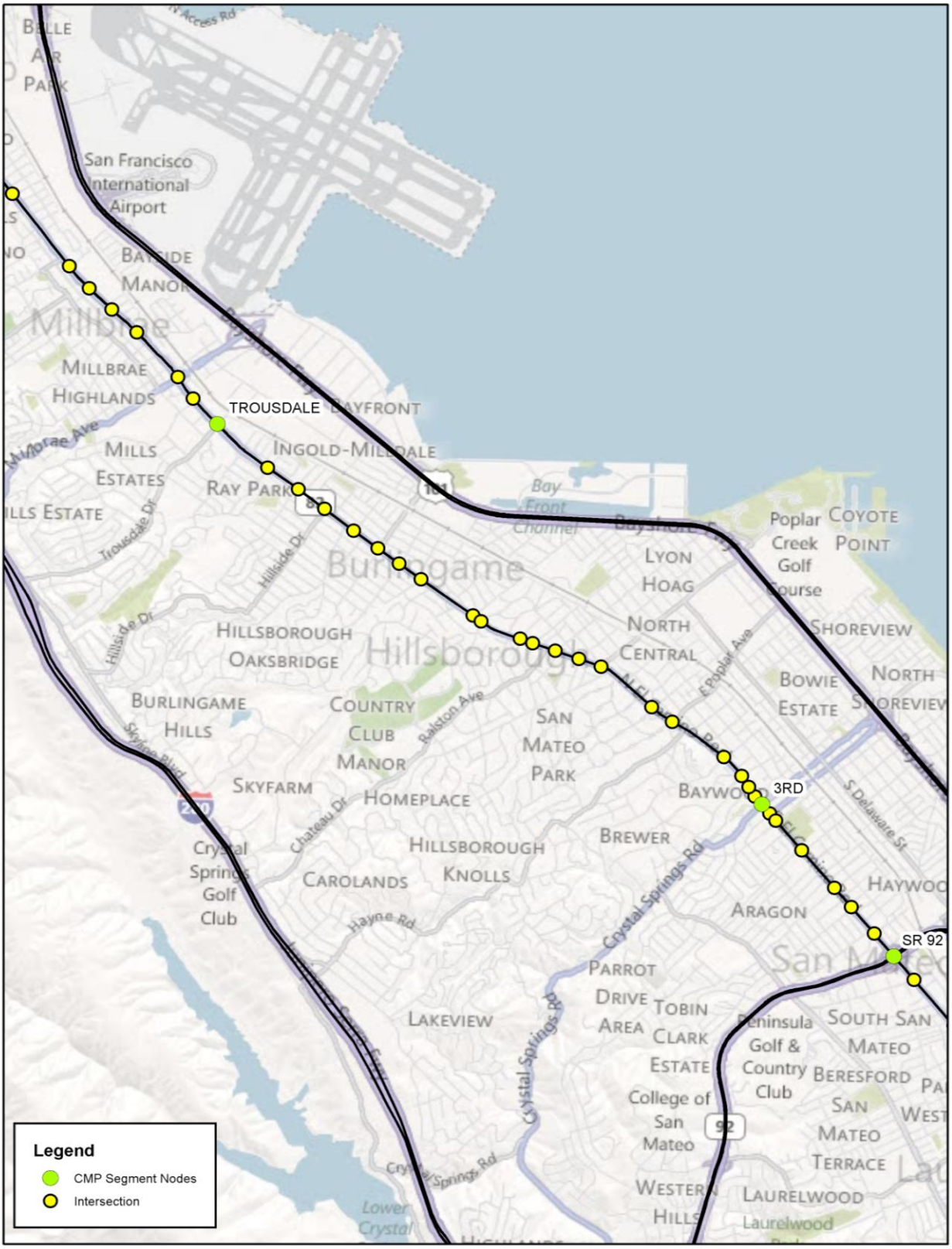


Figure 3 – 21 Included Intersection Segments on SR 82 between 3rd Street and Trousdale

E. ROADWAY LEVEL OF SERVICE (LOS)

Traffic Flow

The Highway Capacity Manual (HCM) defines capacity as "…the maximum hourly rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions."

The vehicle capacity and operational characteristics of a roadway are a function of a number of elements including: the number of lanes and lane widths, shoulder widths, roadway alignment, access, traffic signals, grades, and vehicle mix. Generally, roadways with wider travel lanes, fewer traffic control devices, straight alignments, etc. allow faster travel speeds and therefore greater vehicle flow per unit time.

Level of Service

The HCM defines level of service (LOS) as "…a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience."

"Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions."

In accordance with CMP legislation, the county and city governments are required to show that all CMP route segments within their jurisdiction are operating at or above the CMP traffic LOS standard. Section 65089(b)(1)(B) of the California Government Code states that "In no case shall the LOS standards established be below the LOS E or the current level, whichever is farthest from LOS A. When the level of service on a segment or at an intersection fails to attain the established level of service standard, a deficiency plan shall be adopted pursuant to section 65089.4."

All CMP network segments were evaluated in the spring 2011 monitoring cycle. In addition to the base methodology historically used to evaluate SR 82 which included intersection turning movement counts and 72-hour link counts, the corridor was also monitored for the first time using floating car travel time runs for reference and planning purposes. These results using the floating car results are not subject to performance requirements.

All freeway segments in the network, as included in **Figure 4**, were monitored using the floating vehicle method, which allows for determination of LOS on the basis of average operating speed. C/CAG primarily uses the 1994 and 2000 HCM methodology to monitor LOS on the CMP network, as this methodology was utilized in the baseline monitoring cycle and is necessary to maintain historical comparisons, identify exempt segments, and monitor

potential network deficiencies. The specific methodologies used for monitoring freeway and arterial segments are listed below per HCM definitions:

- **Freeway Segments (HCM 1994 - Chapter 3)** – All freeway segments were evaluated using the "basic freeway sections" methodology of HCM 1994 where the LOS for each freeway segment was determined using its average travel speed.

  Freeway LOS was not calculated based on HCM 2000 methodology. In order to evaluate all freeway segments using the HCM 2000 methodology, the volumes on all freeway sections (mainline) with distinct characteristics (e.g., quantity of lanes), as well as on entrances and exits would be required. Changes to the methodology will be considered along with the next update cycle when the HCM 2010 may be incorporated. Until then, the methodology of previous updates was followed to maintain the historical context for comparisons of the results.

- **Multilane, Two-Lane and Arterial Segments (HCM 1994 – Chapters 7, 8, and 11)** – All non-freeway surface street segments were evaluated based on the volume to capacity ratio (V/C) dependant on the local free-flow speed, cross-section, number of lanes, % no-passing zones, and functional class.

  Multilane and Two-Lane highways were evaluated primarily based on the current volumes as measured through 72-hour traffic counts at 23 locations throughout the county. These counts and resulting V/C were then compared to the applicable criteria in the HCM 1994 to determine the respective LOS.

  Many arterial segments used by C/CAG for CMP purposes (called "CMP Segments") span several blocks and include multiple signals and/or stop controlled intersections. If an Intersection Segment is defined as a segment from one controlled intersection to the next, the CMP segments are a collection of consecutive Intersection Segments. Jacobs methodology of travel time estimation can calculate average speeds at the Intersection Segment level and these data can be aggregated to calculate the average speeds at the CMP segment level. The average speed on each CMP segment is computed as the ratio of total length of the segment to the sum of average travel time on each individual intersection segment within the CMP segment. The average travel time on each intersection segment is computed as the arithmetic mean of travel times of individual floating car runs on that segment. The travel times of individual floating car runs are calculated by measuring the time taken by a floating car to travel from the middle of one controlled intersection to the middle of the next controlled intersection. The average speed thus accounts for time in motion and time spent at the signals or stop signs.

Table 2 shows the relationship between average travel speed and level of service for basic freeways according to HCM 1994. There are four (4) freeway categories based on the free-flow speed of the facility (ranging from 55-70 mph).

*Figure 4 –2011Routes and LOS Methodologies – **Magenta** 72-hour Counts (HCM 1994), **Blue** Freeways and SR 82 using Floating Car (HCM 1994), Yellow Intersections using Peak Period Turning Movement Counts (HCM 2000)*

Table 2 – Example LOS from Freeway with Free-Flow Speed of 65 mph (HCM 1994)

Roadway Type	Basic Freeway
Free Flow Speed (mph) Range	**65**
A	≥ 65
B	≥ 65
C	≥ 64.5
D	≥ 61
E	≥ 56/53
F	< 56

Roadway Segment LOS Analysis Results

Table 3 summarizes the current year roadway segment LOS. Additionally, **Figures 6 and 7** illustrate the results graphically. As highlighted in **Table 3**, there are 13 segments found to be below the established minimum. **Table 3** includes a summary of the historic results since 1999. All results included in this update have consistently used the HCM 1994 for all roadway types and the HCM 2000 for the intersections. Variations in the LOS results may be explained through capital improvements, construction, use of transit and other modes, and reduction in traffic volumes due to the economy. The values included in Table 3 reflect the lowest LOS for either direction on the segment in either the AM or PM peak period. Basically, it is the worst case LOS for the link in either direction in either time of day.

Table 3 – CMP Roadway Segment Monitoring Results (Lowest LOS)

2011 CMP Roadway Segment Levels of Service							
			2011 LOS				
Route	Roadway Segment	LOS Standard	Without Exemption[3]	With Exemption	2009 LOS[2]	2007 LOS[2]	2005 LOS[2]
1	San Francisco County Line to Linda Mar Blvd.	E	F	B	F[3]/ F[4]	F[3]/ F[4]	F[3]/ F[4]
1	Linda Mar Blvd. to Frenchmans Creek Road	E	D	-	D	D	D
1	Frenchmans Creek Road to Miramontes Road	E	E	-	E	E	E
1	Miramontes Road to Santa Cruz County Line	D	B	-	B	B	C
35	San Francisco county Line to Sneath Lane	E	A	-	C	C	C
35	Sneath Lane to I-280	F	F	-	E	F	F
35	I-280 to SR 92	B	C	B	B	B	C/C
35	SR 92 to SR 84	B	B	-	B	B	B
35	SR 84 to Santa Clara County Line	E	B	-	B	B	B
82	San Francisco County Line to John Daly Blvd	E	A	-	A	A	A
82	John Daly Boulevard to Hickey Boulevard	E	A	-	A	A	A
82	Hickey Boulevard to I-380	E	A	-	A	C	A
82	I-380 to Trousdale Drive	E	A	-	A	B	A
82	Trousdale Drive to 3rd Avenue	E	B	-	A	A	A
82	3rd Avenue to SR 92	E	A	-	A	A	A
82	SR 92 to Hillside Avenue	E	A	-	B	B	B
82	Hillside Avenue to 42nd Avenue	E	B	-	B	B	B
82	42nd Avenue to Holly Street	E	A	-	B	B	A
82	Holly Street to Whipple Avenue	E	C	-	C	D	D
82	Whipple Avenue to SR 84	E	B	-	C	C	C
82	SR 84 to Glenwood Avenue	E	B	-	B	B	B
82	Glenwood Avenue to Santa Cruz Avenue	E	B	-	B	C	D
82	Santa Cruz Avenue to Santa Clara County Line	E	A	-	B	B	C
84	SR 1 to Portola Road	C	C	-	C	C	C
84	Portola Road to I-280	E	B	-	B	B	B
84	I-280 to Alameda de las Pulgas	C	D	C	C	D/A	C
84	Alameda de las Pulgas to U.S. 101	E	E	-	E	E	E
84	U.S. 101 to Willow Road	D	B	-	E/E	C	B
84	Willow Road to University Avenue	E	F	C	F/E	F/F	F/F
84	University Avenue to Alameda County Line	F	F	-	F	F	F
92	SR 1 to I-280	E	E	-	E	E	E
92	I-280 to U.S. 101	D	F	F	E[3]/D[4]	F[3]/D[4]	F[3]/ E[4]
92	U.S. 101 to Alameda County Line	E	F	A	A/B[3]	A/B[3]	A/B[3]

Table 3 ('cont) – CMP Roadway Segment Monitoring Results (Lowest LOS)

2011 CMP Roadway Segment Levels of Service							
			2011 LOS				
Route	Roadway Segment	LOS Standard	Without Exemption[3]	With Exemption	2009 LOS[2]	2007 LOS[2]	2005 LOS[2]
101	San Francisco County Line to I-380	E	F	A	D[3]	E[3]	D[3]
101	I-380 to Millbrae Avenue	E	F	C	D[3]	F[3]/C[4]	F[3]/ D[4]
101	Millbrae Avenue to Broadway	E	F	C	F[3]/C[4]	F[3]/C[4]	F[3]/ D[4]
101	Broadway to Peninsula Avenue	E	F	C	F[3]/D[4]	F[3]/C[4]	F[3]/ D[4]
101	Peninsula Avenue to SR 92	F	F	-	F[3]	F[3]	F[3]
101	SR 92 to Whipple Avenue	E	F	D	F[3]/E[4]	F[3]/D[4]	F[3]/ E[4]
101	Whipple Avenue to Santa Clara County Line	F	F	-	F[3]	F[3]	F[3]
109	Kavanaugh Drive to SR 84 (Bayfront Expwy.)	E	C	-	D	D	C
114	U.S. 101 to SR 84 (Bayfront Expressway)	E	B	-	C	C	B
280	San Francisco County Line to SR 1 (north)	E	E	-	F[3]/D[4]	F[3]/A	E[3]
280	SR 1 (north) to SR 1 (south)	E	A/B	-	E	E	E[3]
280	SR 1 (south) to San Bruno Avenue	D	F	D	E[3]/D[4]	F[3]/C[4]	F[3]/ E[4]
280	San Bruno Avenue to SR 92	D	D	-	E[3]/C[4]	A/B[3]	A/B[3]
280	SR 92 to SR 84	D	A/B	-	D[3]	D[3]	D[3]
280	SR 84 to Santa Clara County Line	D	E	A	D[3]	D[3]	E[3]/ C[4]
380	I-280 to U.S. 101	F	F	-	F[3]	F[3]	E[3]
380	U.S. 101 to Airport Access Road	C	A	-	B[3]	D[3]/C	A[3]
Mission St	San Francisco County Line to SR 82	E	A	-	A	A	A
Geneva Ave.	San Francisco County Line to Bayshore Blvd.	E	A	-	A	A	A
Bayshore Blvd.	San Francisco County Line to Geneva Avenue	E	A	-	A	A	A

Notes:

[2] The first value represents LOS without exemptions, and the second value represents LOS with exemptions.

[3] Based on average speed from travel time surveys.

[4] Exemptions applied to volume-to-capacity ratios estimated from average speeds.

"-" = not applicable. LOS standard is not violated. Therefore, exemptions were not applied.

LOS Standard violations (after application of exemptions) are highlighted in red

LOS based on 1994 Highway Capacity Manual Methodology.

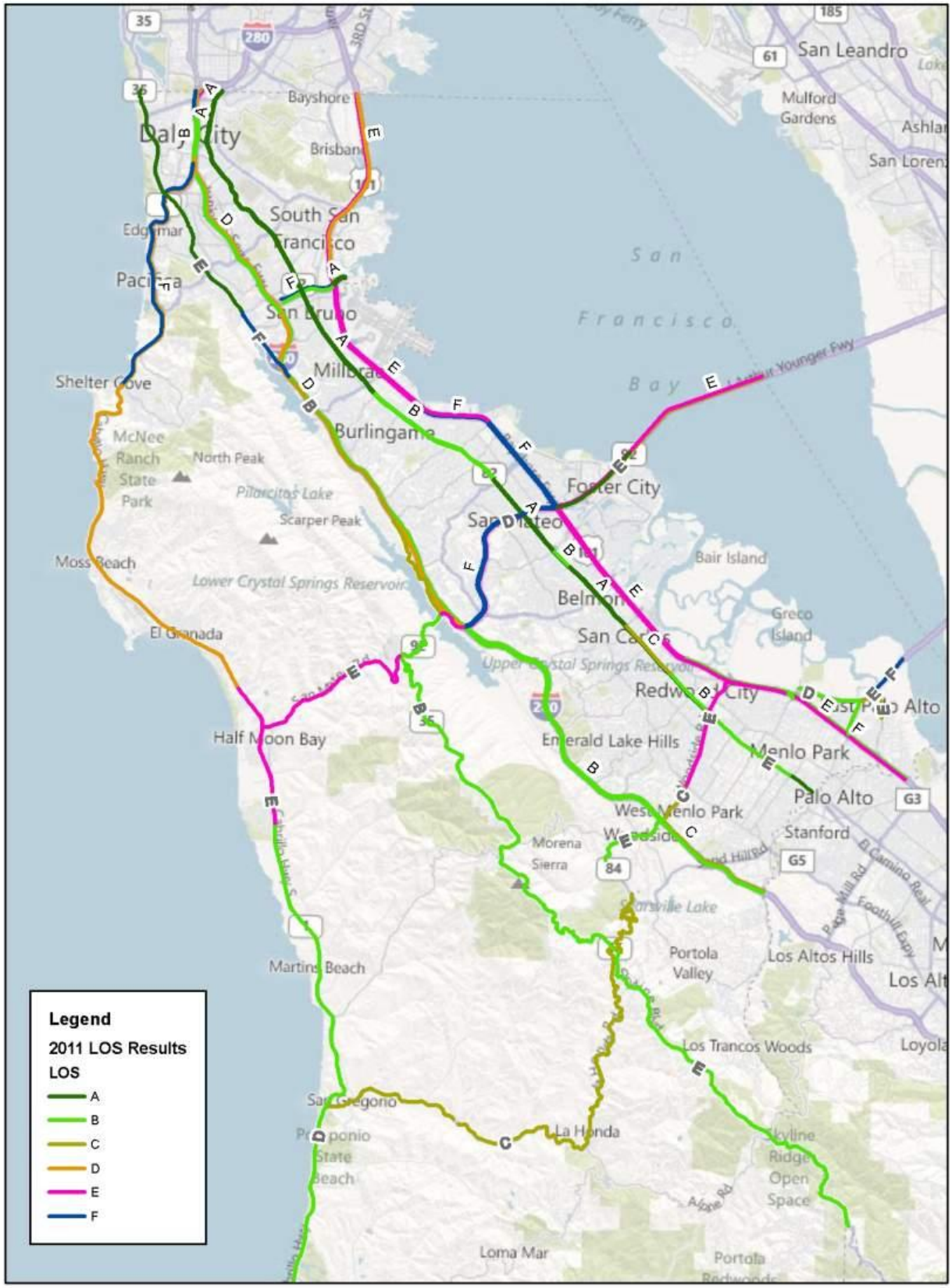


Figure 5 – LOS Results (before Exemptions)

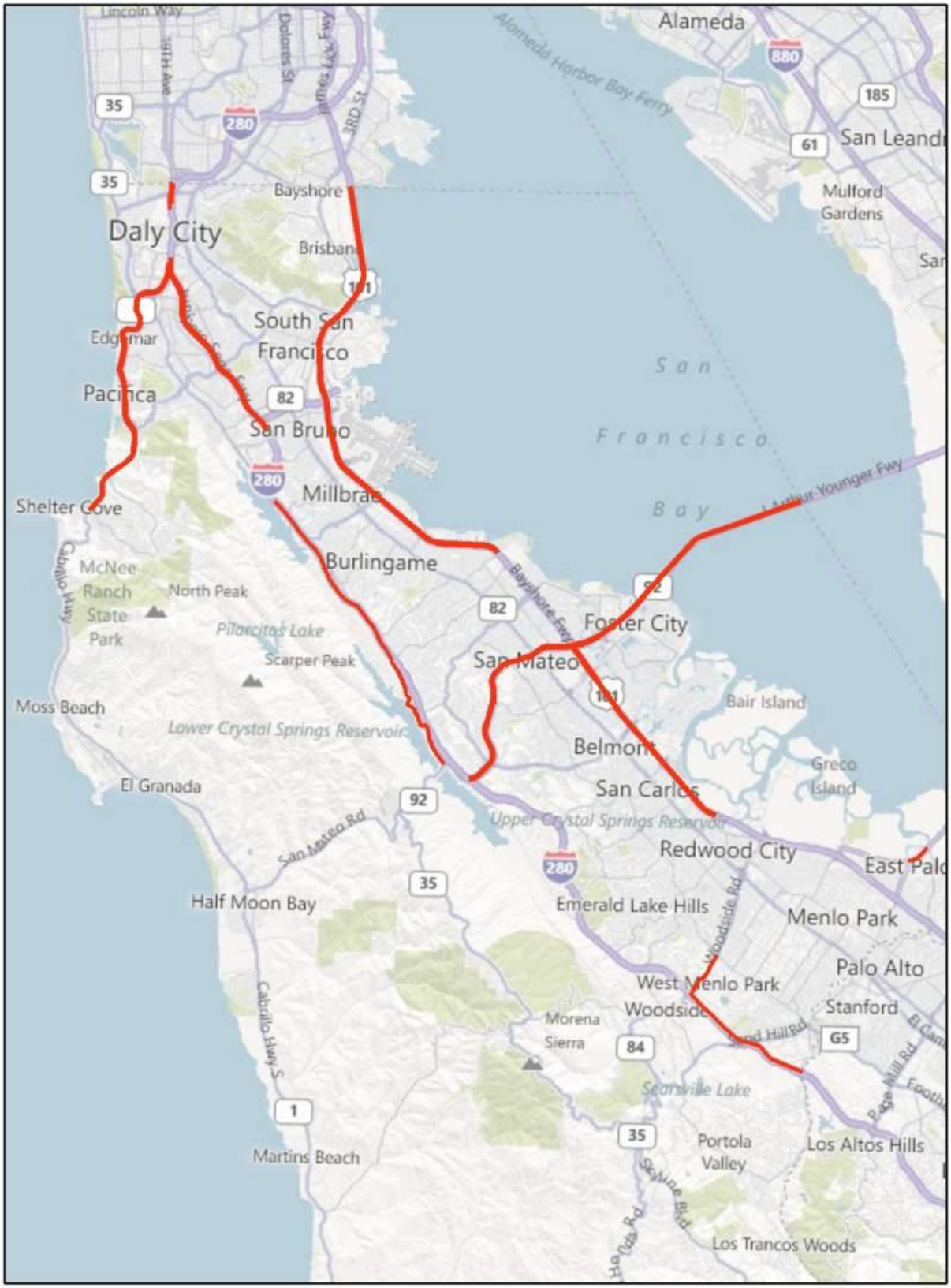


Figure 6 – CMP Segments with LOS Lower than Standard (before Exemptions)

F. REDUCTION IN VOLUMES DUE TO INTERREGIONAL TRIPS

The CMP-enabling legislation allows for the reduction in volume for those trip that are interregional. In this case, "interregional" are those trips that originate from outside the county. That is those that either traverse the county or have a destination within the county. For those CMP segments found with a LOS below the standard, the county travel demand model is used to determine the proportion of the volume estimated to be from interregional travel. As shown in **Table 3**, there were 13 segments that had at least one direction in either the AM or PM peak period that had a lower LOS than the established standard. **Table 4** includes the resulting percentage of traffic from the travel demand model that is estimated to be interregional by segment.

Table 4 – Interregional Trips for Segments with LOS Lower than Standard

Link	Segment	Time Period	AM Peak		PM Peak	
		Direction	NB/WB	SB/EB	NB/WB	SB/EB
Rte 1	SF Co. Line to Linda Mar Blvd	NB, AM & SB, PM	3.2%			55.0%
Rte 35	I-280 to SR 92	SB, AM & PM		24.8%		31.1%
Rte 84	I-280 to Alameda de Las Pulgas	WB, AM & PM	2.6%		6.6%	
Rte 84	Willow to University Av	EB, PM				30.5%
Rte 92	I-280 to US 101	EB & WB, AM & PM	9.3%	40.7%	8.1%	45.0%
Rte 92	US 101 to Alameda Co. Line	WB, PM			100.0%	
Rte 101	SF Co. Line to I-380	SB, PM				99.2%
Rte 101	I-380 to Millbrae Av	SB, PM				56.1%
Rte 101	Millbrae Ave to Broadway	NB, AM; SB, PM	31.1%			42.1%
Rte 101	Broadway to Peninsula Av	NB, AM; SB, PM	36.9%			37.1%
Rte 101	SR 92 to Whipple Rd	SB, AM; NB, PM		36.5%	26.9%	
Rte 280	SR 1 south to San Bruno Ave	SB, AM; NB, PM		67.9%	33.4%	
Rte 280	SR 84 to SC Co. line	NB, PM			91.6%	
Intersection	SR 82 & Millbrae Ave	AM - all approach legs	14.2%			

When applying reductions, they can be deducted directly for those where V/C is the performance measure used, but for those segments that use floating car to determine the average speed of a segment, a few extra steps are required to reflect the exemption. As mentioned earlier, freeway LOS is primarily determined based on density, but historically, the LOS Monitoring Study has made use of the LOS tables as included in the HCM 1994 that include reference speeds for given free-flow speeds and LOS. In order to reflect the reduction, the V/C must first be estimated from the same tables. This adds a level of error given that density is the preferred performance measure and the methodology is to use a secondary measure to estimate another secondary measure, take the reduction, and then reverse the calculation using the V/C and determine the adjusted LOS with the exemption.

G. DEFICIENT CMP SEGMENTS

After incorporating the reduction in volume for those segments found to have a LOS lower than the standard, only one segment was found to be deficient, as shown in **Figure 7**. This segment is also highlighted in Table 3 and is SR 92 between I-280 and US 101. The LOS standard is D and was found to be LOS F with and without the interregional traffic exemption of 45% during the PM peak period.

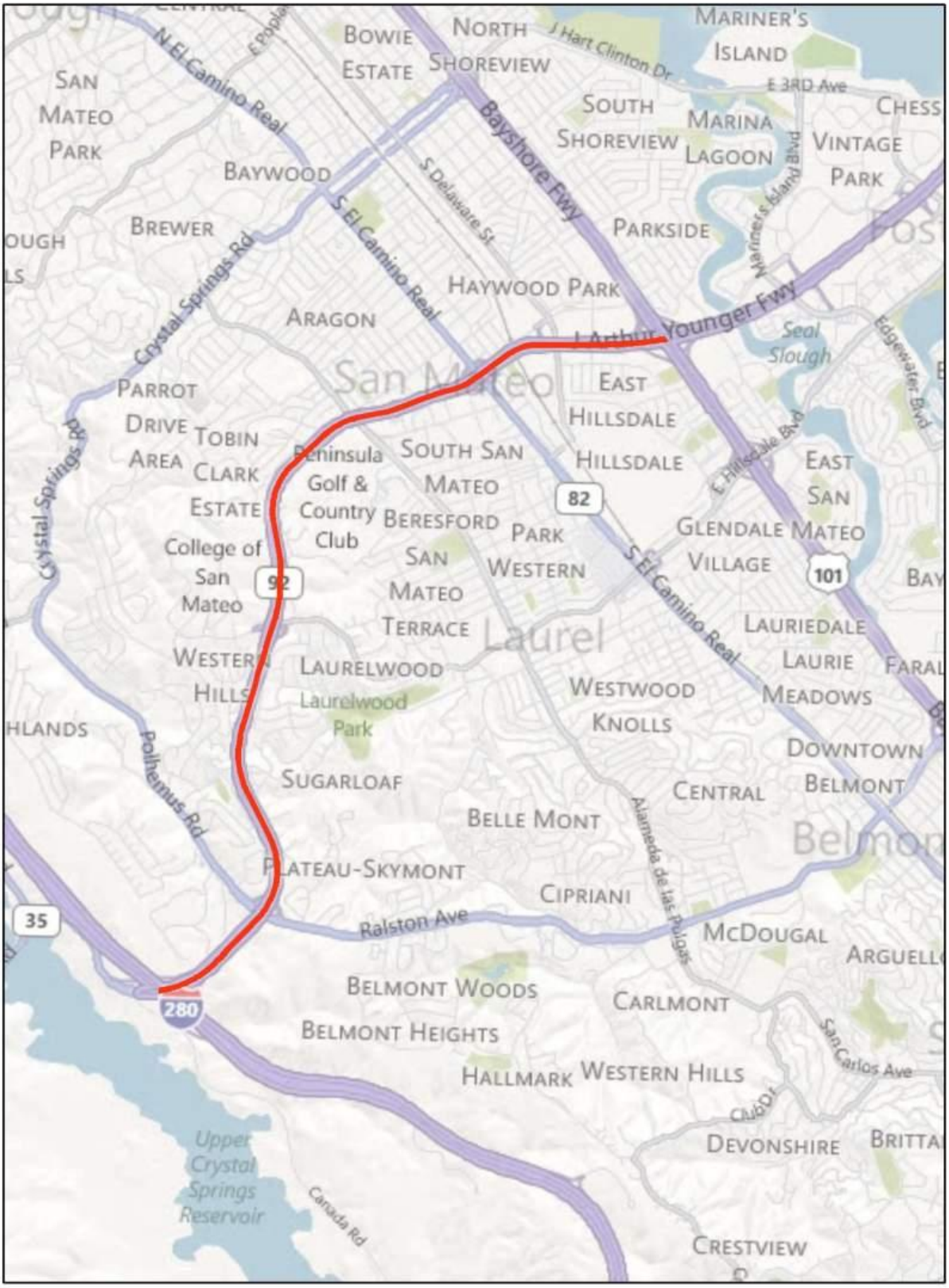


Figure 7 – Deficient Segment after Exemption

H. INTERSECTIONS

Sixteen intersection were analyzed as part of the 2011 LOS Monitoring. These intersections have been included in previous studies since 1999 and are included in **Table 5** for reference. The performance measure for intersection is LOS, but different from freeways and highways, the HCM 2000 was used to determine the LOS. Turning movement counts were collected for each intersection during the AM and PM peak periods and modeled in Synchro. The intersections were analyzed as if they were isolated (not coordinated or in a signal system) and optimized given the existing geometry. The modeled results provide an estimate of the optimized LOS and may not represent the actual conditions if the intersection is either using less than optimal phasing, splits or cycle length. In past reports, the LOS results using Circular 212 was also included, but this year it was eliminated given that it is more applicable to planning studies where limited data is available. The LOS as included with this method in previous studies commonly underestimated the LOS when compared to the methodology of the HCM 1994.

Table 5 includes the results for the 2011 study as well as those back to 2005 using the HCM 2000 methods (other results are included for years back to 1999 using the Circular 212 Method). As highlighted in the table, one intersection was found to be operating at a LOS less than the standard. Intersections 11, 12, 13, and 16 have a LOS standard of F while the others are E. Therefore, intersection #5 – SR 92 at Millbrae is operating at a LOS of F but following the 14.2% reduction in volume based on the current travel demand model, as shown in **Table 4**, the intersection improves to LOS D and is no longer deficient.

Table 5 – Intersection LOS

				2000 HCM Method				Circular 212 Method			
Int #	Intersection	LOS Standard	Peak Hour	2011 LOS	2009 LOS	2007 LOS	2005 LOS	2009 LOS	2007 LOS	2005 LOS	2011 Standard Exceeded
1	Bayshore & Geneva	E	AM	B	C	B	C	A	A	A	No
			PM	B	C	C	C	A	A	A	No
2	SR 35 & John Daly Blvd	E	AM	C	B	B	B	A	A	B	No
			PM	C	C	B	C	C	B	B	No
3	SR 82 & Hillside/John Daly	E	AM	B	C	C	C	A	B	B	No
			PM	C	D	C	D	C	B	C	No
4	SR 82 & San Bruno Ave	E	AM	C	C	C	C	A	A	A	No
			PM	C	D	D	D	A	B	A	No
5	SR 82 & Milbrae Ave	E	AM	F/D	E	E	E	E	E	E	No
			PM	E	D	E	E	D	E	E	No
6	SR 82 & Broadway	E	AM	B	B	B	B	A	A	A	No
			PM	B	A	B	B	A	A	A	No
7	SR 82 & Park-Peninsula	E	AM	C	B	B	B	A	A	A	No
			PM	C	B	B	B	A	A	A	No
8	SR 82 & Ralston	E	AM	C	D	D	E	C	D	D	No
			PM	C	D	D	E	C	D	E	No
9	SR 82 & Holly	E	AM	C	C	C	C	A	A	A	No
			PM	C	D	C	C	C	B	B	No
10	SR 82 & Whipple Ave	E	AM	C	C	C	D	A	A	C	No
			PM	C	D	D	D	C	C	D	No
11	University & SR 84	F	AM	C	B	B	B	C	D	C	No
			PM	F	F	F	E	F	F	E	No
12	Willow & SR 84	F	AM	C	C	C	C	A	B	B	No
			PM	E	F	F	E	E	F	D	No
13	SR 84 & Marsh Rd	F	AM	D	C	C	C	D	B	B	No
			PM	E	F	D	C	F	D	C	No
14	Middlefield & SR 84	E	AM	C	D	D	D	D	D	D	No
			PM	D	D	D	D	D	C	D	No
15	SR 1 & SR 92	E	AM	D	C	D	D	A	B	B	No
			PM	C	D	D	D	B	D	D	No
16	Main St & SR 92	F	AM	C	C	C	C	A	D	D	No
			PM	B	C	C	C	A	C	C	No

Figures 8 and **9** illustrate the finding for the intersection LOS. Each intersection is represented with two circles. The larger one is the base and is the LOS Standard. The smaller circle in the middle is the resulting peak period LOS for the respective time period.

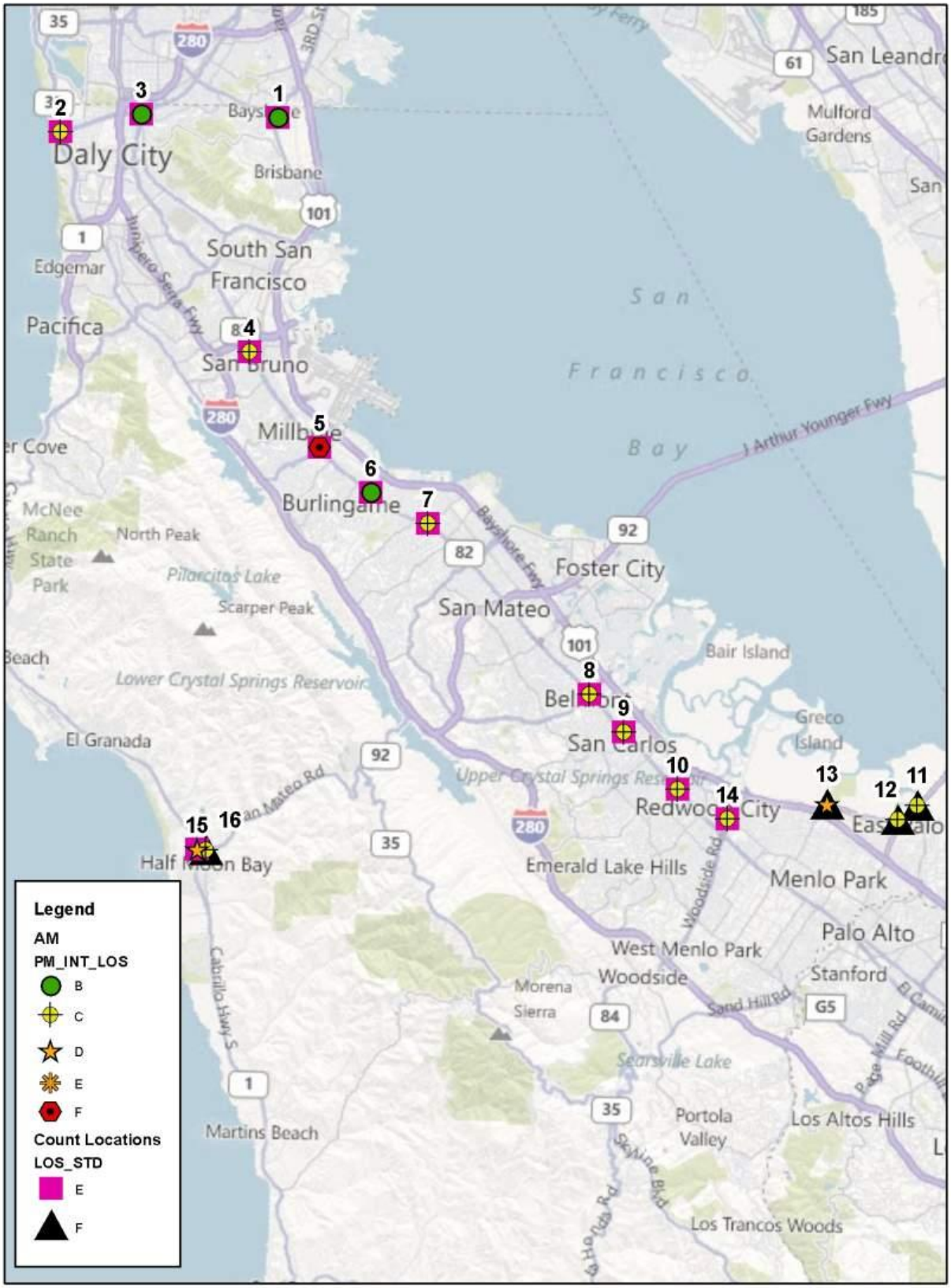


Figure 8 – AM Intersection LOS (Underlying Color is LOS Standard)

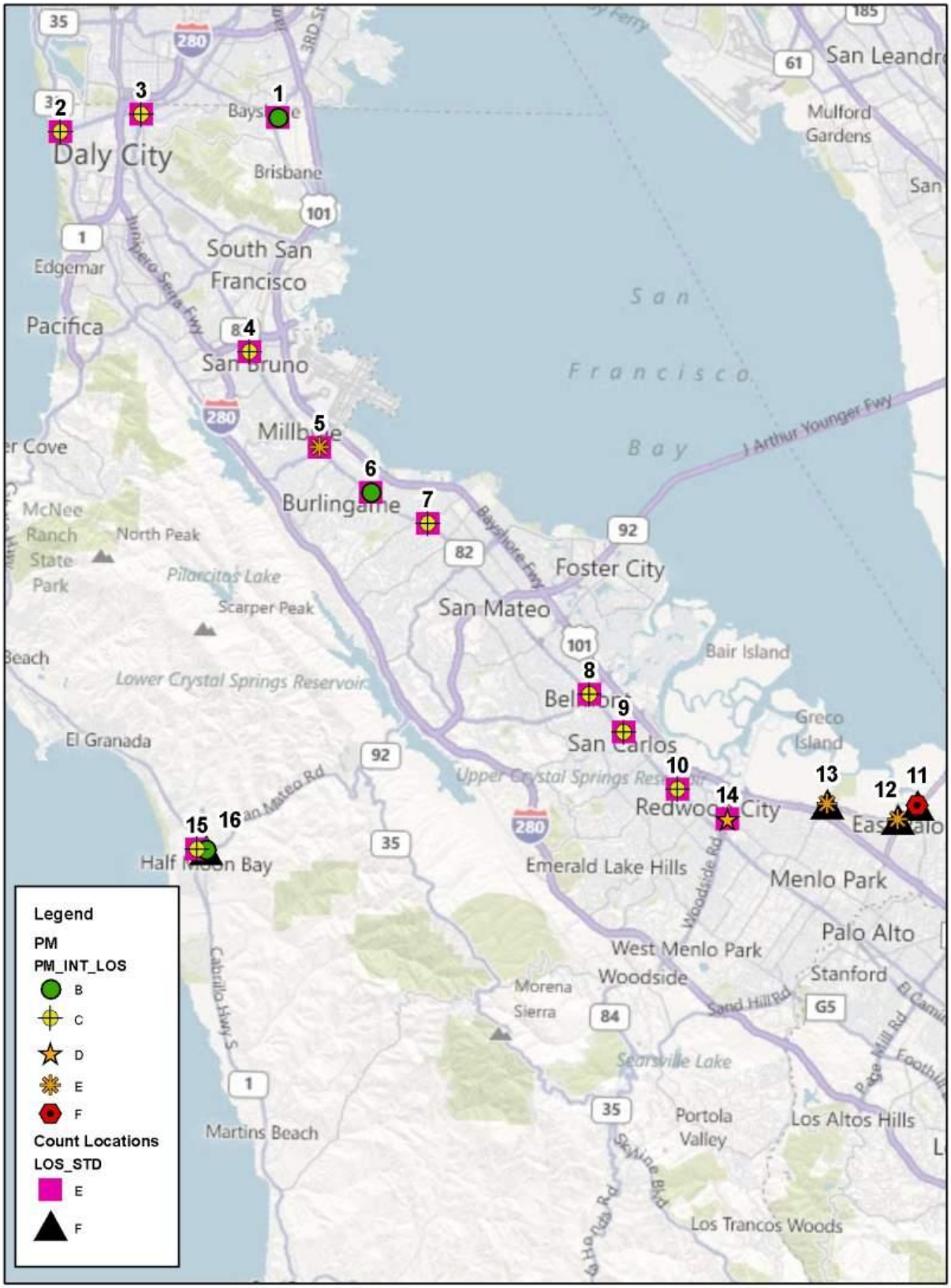


Figure 9 – PM Intersection LOS (Underlying Color is LOS Standard)

I. 2011 MULTI-MODAL PERFORMANCE MEASURE MONITORING PROGRAM

Beginning in 1995, the Transit LOS Standard element of the San Mateo County CMP was replaced with the Performance Measure element. Four Performance Measures were selected and incorporated in the 1997 CMP Update and used each update cycle through 2009. The four measures are used to measure the performance of the overall multi-modal transportation system, including non-automotive modes. They are:

- Level of service,
- Travel times from single-occupant automobiles, carpools, and transit,
- Pedestrian and bicycle improvements, and
- Ridership / person throughput for transit.

This section presents the 2011 measurements of these performance measures and includes the historic results for context.

Level of Service

The levels of service of the CMP corridors and segments are included in the previous sections of this monitoring report. The results show that one roadway exceeded the respective LOS standard following reflection of the interregional trips. For the 16 intersections included in the CMP network, all intersections were found to operated at or better than the established standard after incorporating exemptions.

Travel Times for Single-Occupant Automobiles, Carpools, and Transit

This multi-modal performance measure compares the travel time of the various modes available in the US 101 corridor from the Santa Clara County line to the San Francisco County line. Those include using the general purpose lanes, using the carpool lane for the limits available, or using transit via SamTrans or Caltrain.

The general purpose travel times previously presented early in this report will represent the average time and speed for those using the general purpose lanes for the full length of the county along US 101.

The current limits of the carpool lane in San Mateo County are from the Santa Clara County line to Whipple Avenue. For those that are able to use this lane during the peak hours, the remainder of the run will take place in the general purpose lane.

Travel times for those using transit include the option to access SamTrans route KX along the US 101 corridor or Caltrain. The travel times for the transit options are represented based on the published schedules. Actual data collection for these routes was not performed but is shown consistent with methods used in previous LOS monitoring studies.

The travel times for the various mode options are included in **Table 6** below. The table includes the respective travel times, listed by direction and peak periods, for the current reporting period as well as previous years back to 2005.

Table 6 – Average Travel Time in US 101 Corridor (in minutes)
Between San Francisco and Santa Clara County Lines

Mode	AM - Morning Commute Peak Period								PM - Evening Commute Peak Period							
	Northbound				Southbound				Northbound				Southbound			
	2011	2009	2007	2005	2011	2009	2007	2005	2011	2009	2007	2005	2011	2009	2007	2005
Auto - Single Occ.	29	30	26	31	34	28	35	38	32	33	33	33	40	29	30	35
Carpool - HOV Lane	28	30	26	30	30	26	31	31	30	32	31	32	35	27	29	32
Caltrain (combined local and express)	35	35	35	42	31	31	34	42	34	34	38	42	35	35	34	42
SamTrans Route KX	76	79	75	72	81	85	78	72	81	83	80	79	78	89	81	75

The AM and PM northbound auto travel times in the general purpose lanes have remained unchanged since 2009. In contrast, the southbound runs in the same general purpose lanes have increased in both the AM and PM periods by as much as 38% (from 29 to 40 minutes in the PM period).

The carpool travel times have increase slightly in all cases other than the northbound AM period.

Caltrain has maintained its schedules since 2009 on the Baby Bullet express that was introduced in 2005, thus the travel times remain unchanged.

The published schedule for SamTrans Route KX indicate a shorter schedule by as much as 11 minutes for the southbound PM route.

Pedestrian and Bicycle Improvements

The purpose of this performance measure is to maintain a focus on non-vehicular alternatives. This should be reflected in connectivity to transit and other modes to not only make connections convenient, but safe and attractive. During the CMP update process, seven-year Capital Improvement Program (CIP) projects are identified and evaluated. The top-ranked projects are forwarded to MTC to be evaluated in the regional process for State and Federal funding.

C/CAG developed the San Mateo County Comprehensive Bicycle and Pedestrian Plan (September 2011) to address the planning, design, funding, and implementation of bicycle and pedestrian projects of countywide significance. The Plan includes a policy framework to guide and evaluate implementation of projects identified by the local implementing cities and the County. To maximize funding available for bikeway projects, the Plan emphasizes projects that improves safety, promote access to jobs, and located within high population as well as employment densities. The Plan also establishes geographical focus areas for countywide investment in pedestrian infrastructure.

Ridership / Person Throughput for Transit

The purpose of this performance measure is to document the number of patrons using the available transit options. Within San Mateo County, there are three options including SamTrans, Caltrain, and BART. BART has three stops that serve the county including the SFO Airport extension that opened in 2005, Colma, and Daly City.

The 2011 transit ridership data for SamTrans, Caltrain, and BART (Bay Area Rapid Transit) is included in Table 7. The FY 2011 data indicates annual and average weekday ridership for SamTrans has decreased approximately 10% whereas Caltrain ridership has remained relatively the same when compared to FY 2009. Data for BART indicates a slight decrease for the Colma and Daly City stations and an increase of 2% for the SFO Extension stations. Total transit ridership indicates a decrease of about 3% (annually and average weekday) when compared with FY 2009.

Table 7 – Transit Ridership

	Annual Total				Average Weekday			
	2011	2009	2007	2005	2011	2009	2007	2005
SamTrans	13,474,466	14,951,949	14,351,402	14,189,548	44,910	49,950	47,535	46,797
Caltrain	12,673,420	12,691,612	10,980,802	9,454,467	39,909	40,066	34,867	29,270
BART (Colma & Daly City)	7,014,816	7,026,186	6,864,974	6,211,514	23,598	23,711	23,214	20,992
BART (SFO Ext. Stations)	10,097,310	9,900,626	7,662,450	6,788,036	32,294	31,485	24,516	22,196
Combined Transit	43,260,012	44,570,373	39,859,628	36,643,565	140,711	145,212	130,132	119,255

APPENDIX

AM and PM Roadway LOS Tabular Results

TECHNICAL APPENDIX

- The technical details, database and support documents are included in a separate geographic information system (GIS) deliverable

APPENDIX G

Status of Capital Improvement Projects

STATUS OF CAPITAL IMPROVEMENT PRJOECTS

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
1997/98	Demonstration	Freeway	San Mateo	Route 92 and El Camino Real interchange improvements	2.8 M	X			
1997/98	Demonstration, SAFETEA-LU (HPP)		Pacifica	San Pedro Creek Bridge project at Route 1	1.2 M, 2.2M	X			
1997/98	STIP	Freeway	Half Moon Bay	Route 92 and Main Street intersection improvements: Route 92 widening and realignment	2.8M				X
2004/05	MTC HIP 2nd cycle Transp	Bike/Ped	South San Francisco	BART Linear Park Project (Park Station Lofts Project)	304,800				X
2004/05	MTC RBPP	Bike Ped	Daly City	Lake Merced Blvd Bike Lane (PSE)	74,000				X
2004/05	MTC TLC	Bike/Ped	South San Francisco	BART Linear Park Project	970,000				X
2004/05	SAFETEA-LU (HPP)	Bike/Ped	Belmont	US101 pedestrian bridge	1.7248M & 880,000				X
2004/05	SAFETEA-LU (HPP)	Other Roadway Improvements	C/CAG	Dumbarton Bridge to US 101 connection improvement study	352,000	X			
2004/05	SAFETEA-LU (HPP)	Freeway	SMCTA	Route 101 Auxiliary Lanes: San Mateo 3rd Ave to Millbrae Ave	2.64M				X
2004/05	TOD 3rd Cycle (Co CMAQ)	Ped	Daly City	American Baptist Homes of the West (Mission St Ped improve)	54,530			X	
2004/05	TOD 3rd Cycle (Co CMAQ)	Ped	Daly City	Landmark Plaza Development (Mission St Ped improvement)	238,470			X	
2004/05	TOD 3rd Cycle (Co CMAQ)	Bike Ped	San Mateo	Palm Residences (Delaware Street Improvement)	37,000				X
2004/05	TOD 3rd Cycle (Co TE)	Bike Ped	South San Francisco	SSF BART Station Transit Village (Park Station)	117,012			X	
2004/05	TOD Incentive	Community Improvement	Daly City	Landmark Plaza Development Project	486,200			X	
2004/05	TOD Incentive	Community Improvement	Daly City	Hillcrest Senior Housing	129,100			X	
2004/05	TOD Incentive	Community Improvement	Daly City	Mission Street/John Daly Boulevard Pedestrian Plaza	615,300			X	
2004/05	TOD Incentive	Community Improvement	Redwood City	Villa Montgomery Housing Development streetscape improvements	387,900				X
2004/05	TOD Incentive	Community Improvement	San Bruno	El Camino Real/San Bruno Avenue Streetscape Improvement Project	103,800	X			
2004/05	TOD Incentive	Community Improvement	San Mateo County	Colma Transit Village Apartments connections	1,078,800				X
2005/06	CMIA, SAFETEA-LU (HPP)	Freeway	SMCTA	Route 101 Auxiliary Lanes: Marsh Road to Santa Clara County	60M, 1.58M			X	

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2005/06	STIP	Operational Improvements	C/CAG	San Mateo County Intelligent Transportation System (ITS) Project	1.977M			X	
2005/06	STIP	Operational Improvements	Caltrans	El Camino Real Signal Coordination	5.0M			X	
2005/06	STIP	R.R. Grade Separations /Crossing Improve	SMCTA	Tilton Avenue and E. Poplar Avenue RR Grade Separations	9.103M			X	
2005/06	STP	Road Pavement	East Palo Alto	Bay Road rehabilitation	122,000				X
2005/06	STP	Road Pavement	San Bruno	Various streets rehabilitation	294,000				X
2005/06	STP	Road Pavement	San Mateo	Alameda de las Pulgas rehabilitation	448,000				X
2006/07	CMAQ	Ramp Meter	San Mateo County	US 101 San Mateo Ramp Metering (CON)	500,000				X
2006/07	MTC RBPP	Bike Ped	Daly City	Lake Merced Blvd. Bicycle Lane Project (CON)	463,000				X
2006/07	MTC RBPP	Bike Ped	Daly City	Lake Merced Blvd Bike Lane project	537,000				X
2006/07	MTC TLC	Bike Ped	SSF	BART Linear Park (CON)	1,933,000				X
2006/07	STP	Road Pavement	Belmont	Old County Road Rehabilitation (PE)	14,000				X
2006/07	STP	Road Pavement	Daly City	Mission Street rehabilitation	395,000				X
2006/07	STP	Road Pavement	Foster City	Chess Drive rehabilitation	128,000				X
2006/07	STP	Road Pavement	South San Francisco	Grand Ave Rehabilitation (CON)	290,000				X
2006/07	STP 2nd Cycle	Other Roadway Improvements	Belmont	Old County Road rehabilitation	134,000				X
2006/07	STP 2nd Cycle	Road Pavement	Menlo Park	Sand Hill Road rehabilitation	184,000				X
2006/07	STP 2nd Cycle	Road Pavement	Millbrae	Millbrae Avenue rehabilitation	110,000				X
2006/07	STP 2nd Cycle	Road Pavement	San Mateo County	Various streets rehabilitation	500,000				X
2006/07	STP 2nd Cycle	Road Pavement	South San Francisco	Grand Avenue rehabilitation	290,000				X
2006/07	STP 3rd Cycle	Road Pavement	Atherton	Valparaiso Avenue Rehabilitation (CON)	470,000				X

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2006/07	STP 3rd Cycle	Road Pavement	Daly City	East Market & Hillside Blvd Rehabilitation (CON)	350,000				X
2006/07	STP 3rd Cycle	Road Pavement	Menlo Park	Sand Hill Road Rehabilitation/Resurfacing (CON)	707,000				X
2006/07	STP 3rd Cycle	Road Pavement	Pacifica	Palmetto Avenue Rehabilitation (CON)	405,000				X
2006/07	STP 3rd Cycle	Road Pavement	Redwood City	Alameda de las Pultgas/Bay Road Rehabilitation combined w/ Bay Rd/Florence St (CON)	900,000				X
2006/07	STP 3rd Cycle (backfill)	Road Pavement	Half Moon Bay	SR 92 / Main Street Widening (CON)	1,544,000				X
2007/08	Regional Bike /Ped	Bike Ped	County	El Granada (Coastside) bicycle & pe	181,287				X
2007/08	Regional Bike /Ped	Bike Ped	Daly City	Mission Street pedestrian improvements	500,000				X
2007/08	Regional Bike /Ped	Bike Ped	Pacifica	San Pedro Terrace multi-purpose trail	1,000,000				X
2007/08	Regional Bike /Ped	Bike Ped	San Mateo	Delaware Street bicycle and pedestrian improvements	282,600				X
2007/08	Regional Bike /Ped	Bike Ped	SSF	Linear Park trail	537,950				X
2007/08	STIP	ITS	Caltrans	El Camino Real Signa Interconnect and Upgrade	7,135,000			X	
2007/08	STIP	Highway	Caltrans/SMCTA	Auxiliary lanes - 3rd Ave to Millbrae Ave	100,000,000				X
2007/08	STP 3rd Cycle	Road Pavement	Burlingame	Calif Dr Resurfacing	103,000				X
2007/08	STP 3rd Cycle	Road Pavement	Burlingame	Hillside Dr Resurfacing	72,000				X
2007/08	STP 3rd Cycle	Road Pavement	Burlingame	Rollins Rd Resurfacing	103,000				X
2007/08	STP 3rd Cycle	Road Pavement	County	Bay Road Resurfacing	250,000				X
2007/08	STP 3rd Cycle	Road Pavement	Foster City	Foster City Blvd Resurfacing	337,000				X
2007/08	STP 3rd Cycle	Road Pavement	Foster City	Shell Blvd Resurfacing	140,000				X
2007/08	STP 3rd Cycle	Road Pavement	Menlo Park	Oak Grove Ave. Resurfacing	109,000				X
2007/08	STP 3rd Cycle	Road Pavement	Millbrae	Skyline Blvd. Pavement repair	124,000				X

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2007/08	STP 3rd Cycle	Road Pavement	Pacifica	Sharp Park Rd rehab	165,000				X
2007/08	STP 3rd Cycle	Road Pavement	Pacifica	Terra Nova Blvd rehab	175,000				X
2007/08	STP 3rd Cycle	Road Pavement	Pacifica	Oddstadd Blvd rehab	150,000				X
2007/08	STP 3rd Cycle	Road Pavement	San Mateo	J. Hart Clinton Rehab	575,000				X
2007/08	STP 3rd Cycle	Road Pavement	San Mateo	Poplar Ave. Rehab	325,000				X
2007/08	TDA Art 3	Bike Ped	Brisbane	Bayshore Corridor North-South Bikeway Project (Class II)	550,000				X
2007/08	TDA Art 3	Bike Ped	Burlingame	California Drive: Shared-Lane Bike Route (Class III)	25,387				X
2007/08	TDA Art 3	Bike Ped	Burlingame	In-Pavement Illuminated Crosswalk System at Broadway & Paloma	40,000				X
2007/08	TDA Art 3	Bike Ped	Burlingame	Howard Avenue Bike Lane (Class II)	50,467				X
2007/08	TDA Art 3	Bike Ped	Daly City	Soutgate Avenue Bike Lanes (Class II & III)	100,000				X
2007/08	TDA Art 3	Bike Ped	Daly City	Traffic Accessibility Modifications (Audible and Countdown)	40,000				X
2007/08	TDA Art 3	Bike Ped	Half Moon Bay	Highway 1 Bicycle Trail Project - Class I	500,000				X
2007/08	TDA Art 3	Bike Ped	Menlo Park	Install Video Detection Systems for Bicycles at Intersections	110,000				X
2007/08	TDA Art 3	Bike Ped	San Mateo County Parks	Crystal Springs Regional Trail Design/Construction Documents	105,000		X		
2007/08	TDA Art 3	Bike Ped	South San Francisco	Bikeway Connections and Kiosk	25,738		X		
2008/09	CMAQ	Operational Improvements	C/CAG	Traffic Incident Management (PE)	367,000				X
2008/09	CMAQ	Pedestrian	Colma	D' Street Pedestrian Enhance (CON)	235,000				X
2008/09	CMAQ	Pedestrian	Colma	D' Street Pedestrian Enhance (CON)	250,000				X
2008/09	CMAQ	Pedestrian	Daly City	Mission St. Ped. Improvements. Ph. I (CON)	47,000			X	
2008/09	CMAQ	Pedestrian	Daly City	Mission St. Ped. Improvements. Ph. I (CON)	499,000			X	

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2008/09	CMAQ	Pedestrian	Daly City	Mission St. Ped. Improvements. Ph. I (CON)	293,000			X	
2008/09	CMAQ	Pedestrian	Daly City	Mission St. Ped. Improvements. Ph. I (CON)	123,000			X	
2008/09	CMAQ	Pedestrian	Daly City	Mission St. Ped. Improvements. Ph. I (CON)	900,000			X	
2008/09	CMAQ	Pedestrian	Pacifica	San Pedro Terrace multi-purpose trail (CON)	150,000				X
2008/09	CMAQ	Pedestrian	Pacifica	San Pedro Terrace multi-purpose trail (CON)	450,000				X
2008/09	CMAQ	Pedestrian	Pacifica	San Pedro Terrace multi-purpose trail (PE)	50,000				X
2008/09	CMAQ	Streetscape	Redwood City	ECR/Broadway Streetscape (CON)	8,000				X
2008/09	CMAQ	Streetscape	Redwood City	ECR/Broadway Streetscape (CON)	251,000				X
2008/09	CMAQ	Streetscape	Redwood City	ECR/Broadway Streetscape (CON)	380,000				X
2008/09	CMAQ	Streetscape	San Mateo	Delaware Street Improvements (CON)	70,000				X
2008/09	CMAQ		San Mateo County	Mirada Surf Coastal Trail (CON)	181,000				X
2008/09	CMAQ		San Mateo County	Colma - 'F' Street Sidewalk and streetscape (CON)					X
2008/09	CMAQ		San Mateo County	Menlo Park - Santa Cruz Ave Ped Improv (CON)	27,000				X
2008/09	CMAQ	Bike	San Mateo County	Westborough Blvd Bike lanes improve	18,000				X
2008/09	CMAQ		San Mateo County	Install Permanent Traffic Calming Advisory signs	40,000				X
2008/09	CMIA	Highway	Caltrans/SMCTA	Auxiliary lanes - Marsh to Embarcadero	74,221,000			X	
2008/09	STIP	ITS	CCAG	San Mateo County Smart Corridors	11,000,000		X		
2008/09	STP	Road Pavement	Belmont	Old County Rd Rehab (CON)	120,000				X
2008/09	STP	Road Pavement	Foster City	Shell Blvd Rehab					X
2008/09	TDA Art 3	Bike Ped	Belmont	Curb ramps	40,000				X

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2008/09	TDA Art 3	Bike Ped	County of San Mateo - Parks	Mirada Surf Coastal Trail	100,000				X
2008/09	TDA Art 3	Bike Ped	Daly City	Install sidewalk bulb-outs	50,000				X
2008/09	TDA Art 3	Bike Ped	Daly City	New sidewalk and curb ramps	55,000				X
2008/09	TDA Art 3	Bike Ped	East Palo Alto	Convert Rail Spur into a ped trail	100,000				X
2008/09	TDA Art 3	Bike Ped	Half Moon Bay	Class I trail on Hwy 1	100,000				X
2008/09	TDA Art 3	Bike Ped	San Bruno	Install Class II Bike Lanes	32,500				X
2008/09	TDA Art 3	Bike Ped	San Bruno	Specialized routing signs	9,000				X
2008/09	TDA Art 3	Bike Ped	San Carlos	Class III Bike Routes and racks	65,000				X
2008/09	TDA Art 3	Bike Ped	San Mateo	Pedestrian Countdown Signal Heads	15,808				X
2008/09	TDA Art 3	Bike Ped	South San Francisco	Video Detection for bicyclist	76,667				X
2008/09	TDA Art 3	Bike Ped	South San Francisco	Bike route signs	40,000				X
2008/09	TDA Art 3	Bike Ped	South San Francisco	Install 2 in-ground lighted crosswalks	40,000				X
2008/09	TDA Art 3	Bike Ped	Woodside	Reconfigure Woodside Rd lanes	25,000				X
2008/09	TDA Art 3	Bike Ped	Woodside	Modify bike lane drainage inlet	12,000				X
2008/09	TLSP	ITS	CCAG	San Mateo County Smart Corridors	10,000,000		X		
2009/10	ARRA	Road Pavement	Atherton	Atherton Roadway Rehabilitation	718,000				X
2009/10	ARRA	Road Pavement	Belmont	2009 Belmont Overlay	564,000				X
2009/10	ARRA	Bike Ped	Belmont	Belmont Bike Pedestrian Bridge	4,500,000				X
2009/10	ARRA	Road Pavement	Brisbane	Brisbane - Bayshore Blvd Overlay	231,000				X
2009/10	ARRA	Road Pavement	Burlingame	Burlingame Various Streets Resurfacing	551,000				X

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2009/10	ARRA	Road Pavement	Colma	Colma - Serramonte Blvd Pavement Rehabilitation	217,000				X
2009/10	ARRA	Road Pavement	County of San Mateo	San Mateo County Various Streets Resurfacing	1,726,000				X
2009/10	ARRA	Road Pavement	Daly City	Street Resurfacing 2009	1,363,000				X
2009/10	ARRA	Road Pavement	East Palo Alto	East Palo Alto Various Streets Rehabilitation and Resurfacing	421,000				X
2009/10	ARRA	Road Pavement	Foster City	Foster City Blvd Resurfacing Project	440,000				X
2009/10	ARRA	Road Pavement	Half Moon Bay	Half Moon Bay Downtown Streets Rehabilitation	210,000				X
2009/10	ARRA	Road Pavement	Hillsborough	Hillsborough 2009 Asphalt Overlay	813,000				X
2009/10	ARRA	Road Pavement	Menlo Park	Menlo Park Various Resurfacing of Various Federal Aid Routes	710,000				X
2009/10	ARRA	Road Pavement	Millbrae	Millbrae 2009 Various Streets Repair	565,000				X
2009/10	ARRA	Road Pavement	Pacifica	City of Pacifica Various Fed Aid Street Pavement Rehabilitation Project	777,000				X
2009/10	ARRA	Road Pavement	Portola Valley	Portola Valley FY 2008-09 Various Streets Resurfacing	196,000				X
2009/10	ARRA	Road Pavement	Redwood City	Redwood City - various streets overlay	736,000				X
2009/10	ARRA	Bike Ped	Redwood City	Redwood City - El Camino Real/Broadway Streetscape	1,423,000				X
2009/10	ARRA	Road Pavement	San Bruno	San Bruno Various Roadway Resurfacing and Overlays	959,000				X
2009/10	ARRA	Bike Ped	San Carlos	2009 Pedestrian Improvement Project	559,000				X
2009/10	ARRA	Road Pavement	San Mateo	City of San Mateo FY 2008-09 Various FAU/MTS Streets Rehabilitation	1,545,000				X
2009/10	ARRA	ITS	San Mateo	San Mateo County Smart Corridors	1,000,000			X	
2009/10	ARRA	Road Pavement	South San Francisco	South San Francsico FY 2008-09 Various Streets Resurfacing	1,661,000				X
2009/10	STIP (TE)	Bike Ped	San Mateo County	County Bike Lane	200,000			X	
2009/10	STIP (TE)		San Bruno	Median Landscape on El Camino Real	779,000			X	

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2009/10	STIP (TE)		Half Moon Bay	Route 1 median landscaping	223,000				X
2009/10	STIP (TE)	Bicycle	Brisbane	Bayshore Bike Lane	803,000				X
2009/10	TDA Art 3	Bike Ped	Burlingame	Ped/Bike Bridge Connection	136,000		X		
2009/10	TDA Art 3	Bike Ped	Burlingame	Bike Route Signs	7,500		X		
2009/10	TDA Art 3	Bike Ped	Half Moon Bay	Class I Bike/Ped Trail	300,000		X		
2009/10	TDA Art 3	Bike Ped	Menlo Park	Bike Route Signage	4,000		X		
2009/10	TDA Art 3	Bike Ped	Redwood City	Crosswalks & Curb Ramps	33,584		X		
2009/10	TDA Art 3	Bike Ped	Redwood City	Bike Route Sign/Detectors/Racks	42,792		X		
2009/10	TDA Art 3	Bike Ped	Redwood City	In-Roadway Warning Light System	64,860		X		
2009/10	TDA Art 3	Bike Ped	San Bruno	Pedestrian Sidewalk Access Ramps	160,000		X		
2009/10	TDA Art 3	Bike Ped	San Carlos	Bikeway Sign/Detectors/Class II & III	83,500		X		
2009/10	TDA Art 3	Bike Ped	South San Francisco	In-Ground Lighted Crosswalk	47,000				X
2009/10	TDA Art 3	Bike Ped	South San Francisco	Bay Trail Improvements	131,000				X
2010/11	CMAQ	SR2S	CCAG	San Mateo County Safe Routes to School Program	1,279,000		X		
2010/11	CMAQ	Road Pavement	Millbrae	El Camino Real/Victoria Ave Pedestrian	355,000		X		
2010/11	CMAQ		San Carlos	East Side Community Transit (PE)	425,696		X		
2010/11	CMAQ	Bicycle	San Mateo	Delaware Street Bike Lane (PE)	60,000		X		
2010/11	STP		Burlingame	Burlingame - Federal Grant Street	308,000		X		
2010/11	STP	SR2S	CCAG	San Mateo County Safe Routes to School Program	150,000		X		
2010/11	STP	Road Pavement	Daly City	Street Rehab Program	1,058,000		X		

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2010/11	STP	Road Pavement	Pacifica	Pavement Rehab	383,000		X		
2010/11	STP	Road Pavement	Redwood City	2010-11 Street	946,000		X		
2010/11	STP	Road Pavement	San Bruno	Various Streets resurfacing	398,000		X		
2010/11	STP	Road Pavement	San Mateo	Street Rehab of Various Fed.	1,255,000		X		
2010/11	STP	Road Pavement	San Mateo County	Pavement Program	1,416,000		X		
2010/11	STP	Road Pavement	San Mateo County	Resurfacing of Pescadero Creek Road (PE)	84,989		X		
2010/11	STP	Road Pavement	South San Francisco	Various Streets resurfacing	712,000		X		
2010/11	TDA Art 3	Bike Ped	C/CAG	San Mateo County Comprehensive Bicycle and Pedestrian Plan	200,000				X
2011/12	CMAQ		Burlingame	Burlingame Ave. and Broadway District	301,000	X			
2011/12	CMAQ		Daly City	Citywide Accessibility	420,000	X			
2011/12	CMAQ		Half Moon Bay	Hwy 1 Bicycle Pedestrian Trail	420,000	X			
2011/12	CMAQ		Redwood City	Bair Island Bay Trail Improvement	337,000	X			
2011/12	CMAQ	Bicycle	Redwood City	Skyway/Shoreline Bike Route	218,000	X			
2011/12	CMAQ	Bicycle	Redwood City	Skyway/Shoreline Bike Route (PE)	38,000	X			
2011/12	CMAQ		San Bruno	Street Median and Grand	654,000	X			
2011/12	CMAQ		San Bruno	Transit Corridor Pedestrian	263,000	X			
2011/12	CMAQ		San Carlos	East Side Community Transit	1,795,304	X			
2011/12	CMAQ	Bicycle	San Mateo	Delaware Street Bike Lane	545,000	X			
2011/12	CMAQ		San Mateo	El Camino Real Phase 1 Improvement	203,000	X			
2011/12	CMAQ		San Mateo County	CSRT South of Dam Conversion	300,000	X			

Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2011/12	CMAQ		South San Francisco	Regional Gap	261,000	X			
2011/12	STIP	Highway	Caltrans	Aux lane landscaping #700B - 2-yr plant establishment	33,000		X		
2011/12	STIP	Highway	SMCTA	US 101/Willow Interchange Reconstruction	4,500,000		X		
2011/12	STIP	Highway	SMCTA/Pacifica	Hwy 1 San Pedro Creek Bridge Replacement	3,000,000		X		
2011/12	STP	Road Pavement	Menlo Park	2010/11 Resurfacing	385,000	X			
2011/12	STP	Road Pavement	San Carlos	Pavement Rehab Program	319,000	X			
2011/12	STP		San Mateo County	Resurfacing of Pescadero Creek Road	985,011	X			
2011/12	TDA Art 3	Bike Ped	County of San Mateo	Crystal Springs Regional Trail South of Highway 92	194,549	X			
2011/12	TDA Art 3	Bike Ped	County of San Mateo	Crystal Springs Regional Trail South of Highway 92	194,549	X			
2011/12	TDA Art 3	Bike Ped	Half Moon Bay	Highway 1 Trail Extension - Seymour to Wavecrest Road	250,000	X			
2011/12	TDA Art 3	Bike Ped	Menlo Park	Alpine Road Bike Lane Improvements	78,000	X			
2011/12	TDA Art 3	Bike Ped	Redwood City	Brewster Avenue Bicycle Improvements	107,640	X			
2011/12	TDA Art 3	Bike Ped	San Mateo	Bay to Transit Trail - Phase 1	312,000	X			
2011/12	TDA Art 3	Bike Ped	San Mateo	Downtown Bicycle Parking	98,783	X			
2011/12	TDA Art 3	Bike Ped	San Mateo	Downtown Bicycle Parking	98,783	X			
2011/12	TDA Art 3	Bike Ped	South San Francisco	Pedestrian Crossing Improvements at El Camino H.S.	98,000	X			
2012/13	STIP	Highway	C/CAG	San Mateo County Smart Corridor - Segment 3	1,977,000	X			
2013/14	STIP	Highway	SMCTA	US 101/Willow Interchange Reconstruction	1,471,000	X			
2013/14	STIP	Highway	SMCTA	US 101/ Broadway Interchange	19,000,000	X			
2013/14	STIP	Highway	SMCTA/Pacifica	Calera Parkway Project	6,900,000	X			

STATUS OF CAPITAL IMPROVEMENT PRJOECTS

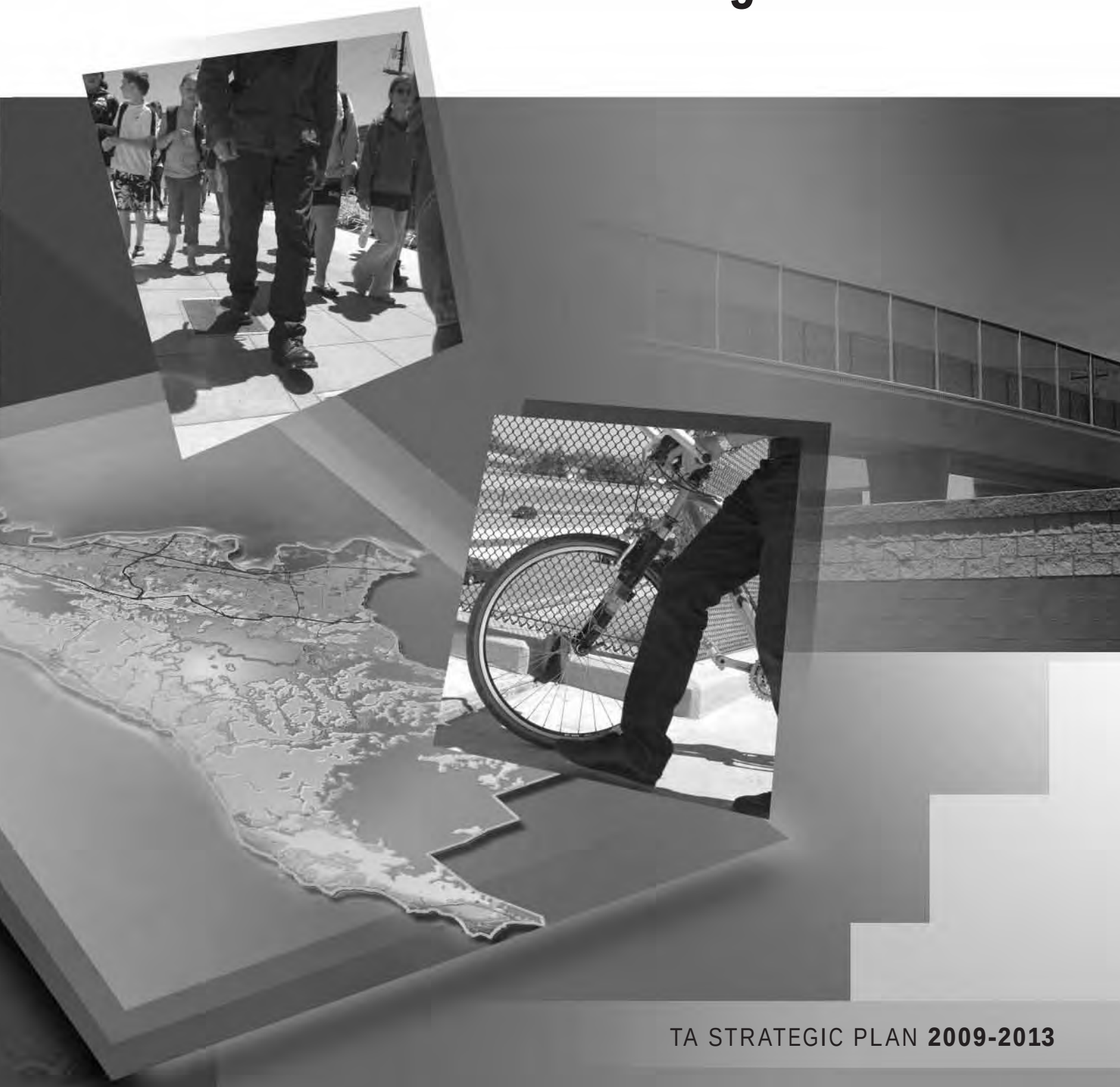
Program Year	Program	Type	Jursidiction	Project Description	Amount	Funding Obligation Pending	Funding Fully Obligated	Under Construction	Completed
2014/15	STIP	Highway	C/CAG	Countywide ITS Project	4,298,000	X			
2014/15	STIP	Highway	SMCTA	US 101/Willow Interchange Reconstruction	20,471,000	X			
2015/16	STIP	Highway	C/CAG	Phase 2 (ENV) at SR 92/US 101 Interchange Vicinity	2,411,000	X			
2016/17	STIP	Highway	San Mateo	Phase 1 - SR 92 Improvement at SR 92/US El Camino Real Interchange	5,000,000	X			

APPENDIX H

Measure A Program Strategic Plan

CHAPTER 3

2009-2033 Measure A Program



3.0 2009 – 2033 Measure A Program

On January 1, 2009, the 2009 – 2033 Measure A Program will commence, continuing the generation of sales tax revenues in San Mateo County for transportation facilities, services and programs. The voter-approved Expenditure Plan sets the program categories and percentage split of the sales tax revenues to each of the program categories described below. Additionally, the guidelines and requirements contained in the Expenditure Plan are highlighted in this section.

3.1 2004 Expenditure Plan Goals

The goals of the 2004 Expenditure Plan Program are:

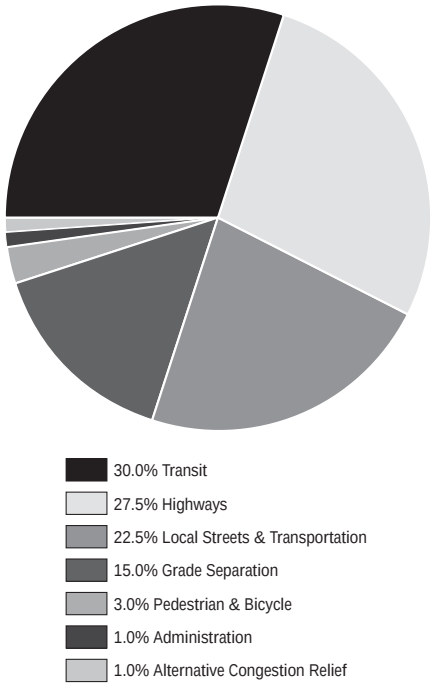
- **Reduce commute corridor congestion**
- **Make regional connections**
- **Enhance safety**
- **Meet local mobility needs**

Meeting these goals involves investment in multiple transportation modes. Funding is identified for six primary program categories: Transit, Highways, Local Streets/Transportation, Grade Separations, Pedestrian and Bicycle, and Alternative Congestion Relief programs. Each category is designated for a percentage share of the total projected revenues which are currently estimated at $1.5 billion (in 2004 dollars) over the life of the Measure A Program, as illustrated in Figure 2 .

The 2004 Expenditure Plan outlines restrictions in the use of Measure A funds to target funding to transportation projects in San Mateo County and maximize the leveraging of other funding. The restrictions include:

- **Measure A funds may not be used to replace or supplant existing funds and resources on projects**
- **Measure A funds may only be used for transportation facilities and services**
- **Measure A funds may only be used for projects within San Mateo County, with exception to the systemwide costs for Caltrain Improvements, and for Highway projects that minimally extend into adjacent counties**

Figure 2. 2004 Expenditure Plan



3.2 Program Category Details

The Measure A Program includes six programs: Transit, Highways, Local Streets/Transportation, Grade Separations, Pedestrian and Bicycle, and Alternative Congestion Relief programs. Funding can be used for planning, design development, construction projects or operations in San Mateo County.

Table 3 lists the total estimated sales tax revenue over the life of the measure for each program category and matching funds from potential local, state and federal sources.

The definition and purpose of each program area are described in the following paragraphs. Also indicated for each program area, if applicable, are key parameters identified in the 2004 Expenditure Plan.

Transit

The Transit Program provides funding for multiple modes of transit including Caltrain, Local Shuttles, Accessible Services, Ferry, the Dumbarton Corridor and BART.

– Caltrain

Caltrain is a 77-mile, 32 station commuter rail system that provides service in the counties of San Francisco, San Mateo and Santa Clara. Caltrain operates 98 weekday trains with less frequent service on weekends, serving nearly 12 million customers a year. The purpose of the Caltrain program is to fund system upgrades and service expansions. Up to 50 percent of the funding can be used for operating expenses.

– Local Shuttle

Local shuttle services are transit shuttle services provided with vehicles that are typically larger than vans and smaller than buses. The purpose of the Local Shuttle program is to meet local mobility needs and provide access to regional transit. These services are envisioned to complement fixed-route bus and rail services.

– Accessible Services

Accessible Services are targeted for paratransit and other transportation services to accommodate people with disabilities, seniors with mobility limitations, and those who need assistance using the existing transportation services. The purpose of the Accessible Services program is to fund Americans with Disabilities Act (ADA) paratransit services, such as Redi-Wheels, and support the operating and capital needs of additional new

Table 3. Transportation Expenditure Plan Program Categories

Program Category	% Share	Estimated Sales Tax (in 2004 dollars)	Estimated Match (in 2004 dollars)
Transit (30%)			
Caltrain	16.0%	$240.0 million	$250 million
Local Shuttles	4.0%	$60.0 million	$60 million
Accessible Services	4.0%	$60.0 million	$228 million
Ferry	2.0%	$30.0 million	$92 million
Dumbarton Corridor	2.0%	$30.0 million	$415 million
BART	2.0%	$30.0 million	$120 million
Highways (27.5%)			
Key Congested Areas	17.3%	$260.0 million	$260 million
Supplemental	10.2%	$153.0 million	$65 million
Local Streets / Transportation	22.5%	$337.5 million	$527 million
Grade Separations	15.0%	$225.0 million	$125 million
Pedestrian and Bicycle	3.0%	$45.0 million	$25 million
Alternative Congestion Relief Programs	1.0%	$15.0 million	$15 million
TOTAL	**100.0%***	**$1,500 million***	**$2,200 million***

*Note: Includes up to 1% for Program Administration

programs for eligible seniors and people with disabilities. The ADA requires transit agencies to provide accessible services to people who are unable to use fixed-route bus or rail service.

– Ferry

Ferries provide transit service via waterways. The purpose of the Ferry program is to invest in cost-effective ferry services in San Mateo County, where currently, there is no ferry service. These services will increase transit options to meet daily transportation needs and also provide countywide transportation relief (and transport of emergency personnel) during times of emergencies. These services will be operated by the San Francisco Bay Area Water Emergency Transportation Authority (WETA), a regional transportation agency created by the California Legislature to develop ferry transit and waterborne emergency response services for the San Francisco Bay Area. Two ferry projects, one in Redwood City and the other in South San Francisco, have been identified in the 2004 Expenditure Plan and are the two projects that are eligible to be funded by this program.

– Dumbarton Corridor

The Dumbarton Corridor, which connects the Peninsula to the East Bay, has been identified as a key corridor for future commuter rail service. This corridor provides a critical component of establishing a regional rail network as identified in the Metropolitan Transportation Commission (MTC) Regional Rail Plan. Building on the investment of purchasing the Dumbarton Corridor right of way with funding from the 1988 Measure A Program, the purpose of this program is to fund station facilities and rail corridor enhancements in East Palo Alto, Menlo Park and Redwood City.

The Dumbarton commuter rail project, which is overseen by the Dumbarton Rail Corridor Policy Advisory Committee (DRCPAC) and project managed by Caltrain, is currently at 10 percent design and in the environmental clearance phase. Once these tasks are complete, the DRCPAC will focus on solidifying the funding plan before defining specific projects to be funded by this program.

– Bay Area Rapid Transit District (BART)

BART is a heavy rail system that operates throughout the counties of San Francisco, San Mateo, Alameda and Contra Costa. BART serves more than 362,000 riders on a typical weekday on its network of 104 miles and 43 stations. The purpose of this program is to fund capital investments and operating expenditures associated with the San Mateo County BART extension, which was completed in 2003.

As outlined in an agreement between BART, SamTrans and the TA, 2 percent of Measure A sales tax revenues will be allocated to BART on an annual basis to fund a portion of the BART operating costs in San Mateo County. Within the general guidelines of the Measure A Program, specific projects to be funded by this program are to be defined by BART consistent with and within the parameters of the agreement between BART, SamTrans and the TA.

Highways

The purpose of this program is to reduce congestion on roadways within San Mateo County. This program is divided into two categories: Key Congested Areas are focused on removing bottlenecks in the most congested highway commute corridors; and Supplemental Roadways are focused on reducing congestion and improving throughput along secondary commute corridors.

– *Key Congested Areas*

The 2004 Expenditure Plan allocates a specified amount of sales tax revenue to five key congested corridors in San Mateo County. Below is the list of eligible projects as identified in the 2004 Expenditure Plan:

- **Highway 280 North Improvements**
  - *Reconstruct I-280/Route 1 Interchange (Daly City)*
  - *Construct Auxiliary Lanes between I-380 and Hickey Boulevard (Daly City, South San Francisco, San Bruno)*
- **Coastside Highway Improvements**
  - *Route 1/San Pedro Creek Bridge Replacement (Pacifica)*
  - *Route 1/Manor Drive overcrossing improvement and widening (Pacifica)*
  - *Route 1 and 92 safety and operational improvements (within and in the proximity of Half Moon Bay)*
- **Highway 92 Improvements**
  - *Auxiliary lanes and interchange improvements between I-280 and the San Mateo Hayward Bridge (San Mateo County, Foster City)*
- **Highway 101 Mid-county Improvements**
  - *Reconstruction of the Highway 101-Broadway Interchange (Burlingame)*
  - *Modification of the Highway 101/Peninsula Avenue Interchange (San Mateo, Burlingame)*
  - *Operational improvements on Highway 101 from Hillsdale to Route 92 (San Mateo)*
- **Highway 101 South Improvements**
  - *Reconstruct the Highway 101/Woodside Road Interchange (Redwood City)*
  - *Highway 101 improvements between Highway 84 and the Santa Clara County line and access improvements to the Dumbarton Bridge (Redwood City, Menlo Park, East Palo Alto)*

– *Supplemental Roadways*

The 2004 Expenditure Plan includes a partial list of specific projects eligible to receive Measure A funding. Other projects (not listed in the plan) can be considered. Below is the partial list of candidate projects as identified in the 2004 Expenditure Plan:

- **Route 35 (I-280-Sneath Lane) widening (San Bruno)**
- **US 101/Produce Avenue Interchange (South San Francisco)**
- **Route 92 (I-280/Route 35) truck climbing lane (San Mateo)**
- **Willow Road adaptive signal control system (Menlo Park)**
- **US 101 (Sierra Point Parkway – SF/SM County Line) auxiliary lanes (South San Francisco, Brisbane)**
- **Geneva Avenue extension (Daly City, Brisbane)**
- **I-280/John Daly Boulevard Overcrossing (north side) widening (San Bruno)**
- **Junipero Serra Boulevard Improvements (Daly City, Colma, South San Francisco)**
- **US 101/Candlestick Point Interchange (Brisbane)**
- **US 101 (Sierra Point Parkway – San Bruno Avenue) auxiliary lanes (Brisbane, South San Francisco)**
- **I-280/I-380 local access improvement (San Bruno)**
- **Highway 101/Sierra Point Pkwy Interchange replacement and Lagoon Way extension (Brisbane)**
- **Triton Drive widening (Foster City)**
- **Sand Hill Road signal coordination (Menlo Park)**
- **Woodside Road widening (US 101-El Camino Real) (Redwood City)**

Local Streets and Transportation

The purpose of this program is to provide funding to the 20 cities and the County of San Mateo for the improvement and maintenance of local transportation facilities and services. This program provides money to local jurisdictions based on the following formula: 50 percent by population and 50 percent by the number of road miles within the jurisdiction. Annually, the TA will update the road miles and population figures based on California Department of Transportation and Department of Finance data. Table 4 below summarizes the estimated allocation and funding over the next 25 years (in 2004 dollars).

Table 4. Estimated Annual Distribution to San Mateo County and Cities

Local Jurisdiction	Allocation (%)	Estimated Funding ($2004)
Atherton	1.886	$ 6,365,250
Belmont	3.543	$ 11,957,625
Brisbane	0.818	$ 2,760,750
Burlingame	4.206	$ 14,195,250
Colma	0.299	$ 1,009,125
Daly City	10.413	$ 35,143,875
East Palo Alto	3.215	$ 10,850,625
Foster City	3.364	$ 11,353,500
Half Moon Bay	1.596	$ 5,386,500
Hillsborough	3.000	$ 10,125,000
Menlo Park	4.851	$ 16,372,125
Millbrae	2.917	$ 9,844,875
Pacifica	5.174	$ 17,462,250
Portola Valley	1.488	$ 5,022,000
Redwood City	9.612	$ 32,440,500
San Bruno	5.034	$ 16,989,750
San Carlos	4.271	$ 14,414,625
San Mateo	11.797	$ 39,814,975
S. San Francisco	7.949	$ 25,815,375
Woodside	1.683	$ 5,680,125
San Mateo Co.	13.184	$ 44,496,000

Grade Separation

The Grade Separation program involves eliminating at-grade railroad crossings. This can be done by raising or lowering roads and/or train tracks at different elevations. The purpose of this program is to provide funding for the construction or upgrade of grade separations along the Caltrain and Dumbarton rail lines in San Mateo County to improve safety and relieve local traffic congestion. The rail crossings to be considered for Measure A funding are listed in the 2004 Expenditure Plan and are located in the cities of South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Redwood City, Atherton, East Palo Alto and Menlo Park.

Pedestrian and Bicycles

Bicycling and walking are sustainable forms of transportation. The purpose of this program is to fund specific projects to encourage and improve bicycling and walking conditions. Qualified expenditures include paths, trails and bridges over roads and highways. The 2004 Expenditure Plan includes a partial list of eligible bicycle and pedestrian projects which are listed below. Other projects will be considered.

- **Route 1/Santa Rosa Avenue Pedestrian Overcrossing (Pacifica)**
- **Route 1 pedestrian/bike trail from Montara through Half Moon Bay (San Mateo County, Half Moon Bay)**
- **Route 35/Route 1 pedestrian/bike overcrossing (Daly City)**
- **Millbrae Avenue/US 101 pedestrian/bike overcrossing (Millbrae)**
- **Hillcrest Boulevard/US 101 pedestrian/bike overcrossing to Bay Trail (Millbrae)**
- **US 101 near Hillsdale Boulevard pedestrian/bike overcrossing (San Mateo)**
- **Ralston Avenue/US 101 pedestrian/bike overcrossing (Belmont)**
- **Willow Road/Bayfront Expressway pedestrian/bike tunnel upgrade (Menlo Park)**
- **Willow Road/US 101 pedestrian/bike overcrossing (Menlo Park)**
- **Portola Road pedestrian/bike path paving (San Mateo County)**

Alternative Congestion Relief

The Alternative Congestion Relief program promotes transit and non-traditional methods of commuting to reduce reliance on the automobile and use of Intelligent Transportation Systems (ITS) to promote efficient use of the transportation network. Commute alternatives receive 0.8 and ITS projects receive 0.2 percent of the Alternative Congestion Relief funds. Example projects include carpool services, transit subsidies, car sharing and telecommuting. The program also utilizes information technology to assist in efficient use of the transportation network. Example projects include travel time signage on highways, accident alerts and rerouting information. This program is essential in completing a multimodal program to maximize transportation options and efficiencies.

Table 5. Program Category Details

Program Category	Description	Purpose	Project Parameters
Transit			
Caltrain	Existing commuter rail system providing train service in San Francisco, San Mateo and Santa Clara Counties	Upgrade and expand Caltrain services in San Mateo County; Fund systemwide improvements and safety	Up to 50% funding for operations
Local Shuttles	Transit services provided with vehicles that are typically larger than vans and smaller than buses	Meet local mobility needs and provide access to regional transit	n/a
Accessible Services	Targeted transportation services for people that have special mobility needs	Provide paratransit and other transportation services to eligible seniors and people with disabilities	n/a
Ferry	Transit service provided by vessels on waterways	Establish ferry services in San Mateo County	For services in Redwood City and South San Francisco
Dumbarton Corridor	A key corridor connecting the East Bay with the Peninsula identified for future commuter rail service	Construct stations and rail enhancements in East Palo Alto, Menlo Park and Redwood City	n/a
BART	Existing heavy rail system providing train services in San Francisco, San Mateo, Alameda and Contra Costa Counties	Maintain and operate BART extension to San Mateo County	Projects to be programmed by BART
Highways			
Key Congested Areas	Highways in San Mateo County	Reduce congestion and increase throughput on highways	Projects to be selected from eligible project list
Supplemental	Local, collector, arterial, state route roadways in San Mateo County	Reduce congestion and increase throughput on roadways	n/a
Local Streets / Transportation	Transportation services, roadways owned and maintained by the cities and County of San Mateo	Improve and maintain local transportation facilities and services	Projects to be programmed by cities and/or county
Grade Separations	Eliminate at-grade railroad crossings	Improve safety and relieve local traffic congestion	n/a
Pedestrian and Bicycle	Pedestrians and bicycle facilities	Encourage walking and bicycling	n/a
Alternative Congestion Relief Programs	Commute alternatives and Intelligent Transportation Systems (ITS)	Efficiently use transportation network and reduce reliance on automobiles	0.8 percent is for commute alternatives and 0.2 percent for ITS projects

APPENDIX I

Land Use Guidelines and Compliance Monitoring

C/CAG

CITY/COUNTY ASSOCIATION OF GOVERNMENTS
OF SAN MATEO COUNTY

Atherton • Belmont • Brisbane • Burlingame • Colma • Daly City • East Palo Alto • Foster City • Half Moon Bay • Hillsborough • Menlo Park • Millbrae Pacifica • Portola Valley • Redwood City • San Bruno • San Carlos • San Mateo • San Mateo County • South San Francisco • Woodside

September 21, 2004

TO: City Managers, Planning Directors, and Public Works Directors

FROM: Tom Madalena, Planner II, City/County Association of Governments

SUBJECT: REVISED C/CAG GUIDELINES FOR THE IMPLEMENTATION OF THE LAND USE COMPONENT OF THE CONGESTION MANAGEMENT PROGRAM

At the C/CAG meeting on September 9, 2004, the Board adopted revised guidelines for the land use component of the Congestion Management Program. We would like to keep you informed of all changes to this policy. The purpose of this revision is to increase the number of options for reducing the impacts of traffic, to provide clarity for the stakeholders involved in the implementation of this policy, and to reallocate the credits associated with some of the transportation demand management measures. All of the revisions to the guidelines are noted in **bold** text. These revisions will take effect immediately.

As a reminder, the Congestion Management Program policy and guidelines must be followed for all projects that meet the following criteria:

1. The project will generate a net 100 or more peak hour trips on the Congestion Management Program roadway network.

2. The project is subject to CEQA review.

If you have a project that meets these criteria, you should follow these steps:

1. Review the guidelines with the project applicant and determine if a combination of the acceptable options/measures will fully reduce the net number of trips that this project is anticipated to generate on the CMP roadway network.

2. If yes, include this information as part of the environmental documents that are circulated and adopted by the local jurisdiction Board.

3. If no, or if new or revised measures are being proposed, contact Tom Madalena for C/CAG review and approval as early in the process as possible so that the agreed upon plan can be included in the environmental documents placed in circulation.

4. If agreement is not reached with C/CAG staff on the plan, an immediate review by the C/CAG Board will be scheduled so that the local jurisdiction project approval process will not be delayed.

As an ongoing and living document, we welcome any suggestions that you may have for the guidelines. Please contact Tom Madalena at 650/363-1867 (tmadalena@co.sanmateo.ca.us) if you have any questions or comments.

Attachment

GUIDELINES FOR IMPLEMENTING THE LAND USE COMPONENT OF THE CONGESTION MANAGEMENT PROGRAM

All land use changes or new developments that require a negative declaration or an Environmental Impact Report (EIR) and that are projected to generate a net (subtracting existing uses that are currently active) 100 or more trips per hour at any time during the a.m. or p.m. peak hour period, must be reported to C/CAG within ten days of completion of the initial study prepared under the California Environmental Quality Act (CEQA). Peak period includes 6:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m. **Peak hour is defined as the hour when heaviest daily traffic volume occurs and generally occurs during morning and afternoon commute times. Traffic counts are obtained during AM and PM peak periods and the volume from the heaviest hour of AM or PM traffic is used to define peak hour for those time periods. The highest number of net trips resulting from AM or PM peak hour will be used. Net trips are calculated by subtracting trips for existing uses from those generated by the new project.** Although projects that generate less than 100 peak hour trips are not subject to these guidelines, local jurisdictions are strongly encouraged to apply them to all projects, particularly where the jurisdiction has determined that the impacts of the project will have an adverse effect on traffic in that jurisdiction.

These guidelines are not intended to establish a Countywide **threshold** of significance of 100 peak hour trips for CEQA purposes. The determination of what level of traffic results in a significant impact is left in the first instance to the local jurisdiction. These guidelines do contemplate, however, that all trips resulting from projects that are reviewed by C/CAG and fall under these guidelines will be mitigated, whether or not it rises to a level of significance under CEQA.

Local jurisdictions must ensure that the developer and/or tenants will reduce the demand for all new peak hour trips (including the first 100 trips) projected to be generated by the development. The local jurisdiction can select one or more of the options that follow or may propose other methods for mitigating the trips. It is up to the local jurisdiction working together with the project sponsor to choose the method(s) that will be compatible with the intended purpose of the project and the community that it will serve. The options identified in these guidelines are not intended to limit choices. Local jurisdictions are encouraged to be creative in developing options that meet local needs while accomplishing the goal of mitigating new peak hour trips. The additional measures that are not specifically included in these guidelines should be offered for review by C/CAG staff in advance of approving the project. Appeals to the decisions by C/CAG staff will be taken to the full C/CAG Board for consideration.

The Congestion Management Program roadway network includes all state highways and selected principal arterials. When considering land use projects, local jurisdictions may either require that mitigation for impacts to the Congestion Management Program roadway network be finally determined and imposed as a condition of approval of the project, or may conditionally approve such project, conditioned on compliance with the requirements to mitigate the impacts to the Congestion Management Program roadway network. In those instances where conditional approval is given, a building permit may not be issued for the project until the required mitigation is determined and subsequently imposed on the project.

Some of the choices for local jurisdictions include:

1. Reduce the scope of the project so that it will generate less than 100 net peak hour trips.
2. Build adequate roadway and/or transit improvements so that the added peak hour trips will have no measurable impact on the Congestion Management Program roadway network.
3. If a local jurisdiction currently collects traffic mitigation fees, any portion of the fees that are used to mitigate the impacts of the project's traffic on the Congestion Management Program roadway network will count as a credit toward the reduction in the demand for trips required under the Congestion Management Program. The developer may also contribute a one-time only payment of $20,000 per peak hour trip (including the first 100 trips) to a special fund for the implementation of appropriate transportation demand management system measures at that development. These funds will be used to implement transportation demand management programs that serve the development making the contribution.
4. Require the developer and all subsequent tenants to implement Transportation Demand Management programs that have the capacity to fully reduce the demand for new peak hour trips. The developer/tenants will not be held responsible for the extent to which these programs are actually used. **The developer shall pay for a monitoring program for the first three years of the development. The purpose of the monitoring program is to assess the compliance of the project with the final TDM plan**. The following is a list of acceptable programs and the equivalent number of trips that will be credited as reduced. Programs can be mixed and matched so long as the total mitigated trips is equal to or greater than the new peak hour trips generated by the project. These programs, once implemented, must be on going for the occupied life of the development. Programs may be substituted with prior approval of C/CAG, so long as the number of **mitigated trips** is not **reduced**. Additional measures may be proposed to C/CAG for consideration. Also there may be special circumstances that warrant a different amount of credit for certain measures. For example, a developer may elect to contract with the Alliance or another provider of TDM services to meet this requirement. These situations can also be submitted to C/CAG in advance for consideration. It is up to each local jurisdiction to use its best judgment to determine the extent to which certain measures are "reasonable and effective." For example, there will be a point where additional showers will not result in more people riding bicycles or walking to work.
5. Adopt Congestion Management Program guidelines for projects within its jurisdiction and submit those guidelines for approval by C/CAG. The local jurisdiction would then apply these guidelines to the appropriate level of project and provide an annual report describing affected projects and guidelines applied. C/CAG would review the jurisdiction's efforts on an annual basis and could require amendments to the jurisdiction's guidelines if the jurisdiction's guidelines were not meeting Congestion Management Program goals.

6. Adopt the C/CAG guidelines for application to the appropriate level of project in the jurisdiction, and submit an annual report describing affected projects and guidelines applied. C/CAG would review the jurisdiction's efforts on an annual basis and could require amendments to the jurisdiction's guidelines if the jurisdiction's guidelines were not meeting Congestion Management Program goals.
7. Negotiate with C/CAG staff for other acceptable ways to mitigate the trips for specific developments on a case-by-case basis.
8. **C/CAG recognizes that for retail or special uses appropriate TDM measures may be difficult to implement. Please contact C/CAG to develop appropriate measures for these types of projects.**

Transportation Demand Management Measure	**Number of Trips Credited**	**Rationale**
Secure bicycle storage	One peak hour trip will be credited for every 3 new bike lockers/racks installed and maintained. **Lockers/racks must be installed within 100 feet of the building.**	Experience has shown that bicycle commuters will average using this mode one-third of the time, especially during warmer summer months.
Showers and changing rooms.	**Ten** peak hour trips will be credited for each new combination shower and changing room installed. **An additional 5 peak hour trips will be credited when installed in combination with at least 5 bike lockers**	**10 to 1 ratio based on cost to build and the likelihood that bicycle utilization will increase.**
Operation of a dedicated shuttle service during the peak period to a rail station or an urban residential area. **Alternatively the development could buy into a shuttle consortium.**	One peak hour trip will be credited for each peak-hour round trip seat on the shuttle. Increases to two trips if a Guaranteed Ride Home Program is also in place. Five additional trips will be credited if the shuttle stops at a child-care facility enroute to/from the worksite.	Yields a one-to-one ratio (one seat in a shuttle equals one auto trip reduced); utilization increases when a guaranteed ride home program is also made available.

Charging employees for parking.	**Two** peak hour trips will be credited for each parking spot charged out at $20 per month for one year. **Money shall be used for TDM measures such as shuttles or subsidized transit tickets.**	Yields a **two**-to-one ratio
Subsidizing transit tickets for employees.	One peak hour trip will be credited for each transit pass that is subsidized at least $20 per month for one year. One additional trip will be credited if the subsidy is increased to $75 for parents using transit to take a child to childcare enroute to work.	Yields a one-to-one ratio (one transit pass equals one auto trip reduced).
Subsidizing pedestrians/bicyclists who commute to work.	One peak hour trip will be credited for each employee that is subsidized at least $20 per month for one year.	Yields a one-to-one ratio (One pedestrian/bicyclist equals one auto trip reduced.
Creation of preferential parking for carpoolers.	Two peak hour trips will be credited for each parking spot reserved.	Yields a two-to-one ratio (one reserved parking spot equals a minimum of two auto trips reduced).
Creation of preferential parking for vanpoolers.	Seven peak hour trips will be credited for each parking spot reserved.	Yields a seven-to-one ratio (one reserved parking spot equals a minimum of seven auto trips reduced).
Implementation of a vanpool program.	Seven peak hour trips will be credited for each vanpool arranged by a specific program operated at the site of the development. Increases to ten trips if a Guaranteed Ride Home Program is also in place.	The average van capacity is seven.

Operation of a commute assistance center, offering on site, one stop shopping for transit and commute alternatives information, preferably staffed with a live person to assist building tenants with trip planning.	One peak hour trip will be credited for each feature added to the information center; and an additional one peak hour trip will be credited for each hour the center is staffed with a live person, up to 20 trips per each 200 tenants. Possible features may include: Transit information brochure rack Computer kiosk connected to Internet Telephone (with commute and transit information numbers) Desk and chairs (for personalized trip planning) On-site transit ticket sales Implementation of flexible work hour schedules that allow transit riders to be 15-30 minutes late or early (due to problems with transit or vanpool). Quarterly educational programs to support commute alternatives	This is based on staff's best estimate. Short of there being major disincentives to driving, having an on site TDM program offering commute assistance is fundamental to an effective TDM program.
Survey Employees to examine use and best practices.	**Three peak hour trips will be credited for a survey developed to be administered twice yearly**	**This is based on staff's best estimate with the goal of finding best practices to achieve the mode shift goal.**
Implementation of a parking cash out program.	One peak hour trip will be credited for each parking spot where the employee is offered a cash payment in return for not using parking at the employment site.	Yields a one-to-one ratio (one cashed out parking spot equals one auto trip reduced.

Implementation of ramp metering.	Three hundred peak hour trips will be credited if the local jurisdiction in cooperation with CalTrans, installs and turns on ramp metering lights during the peak hours at the highway entrance ramp closest to the development.	This is a very difficult and costly measure to implement and the reward must be significant.
Installation of high bandwidth connections in employees' homes to the Internet to facilitate home telecommuting	**One peak hour trip will be credited for every three connections installed. This measure is not available as credit for a residential development.**	Yields a one-to-**three** ratio.
Installation of video conferencing centers that are available for use by the tenants of the facility.	**Five** peak hour trips will be credited for a center installed at the facility.	**This is based on staff's best estimate.**
Implementation of a compressed workweek program.	One peak hour trip will be credited for every 5 employees that are offered the opportunity to work four compressed days per week.	The workweek will be compressed into 4 days; therefore the individual will not be commuting on the 5th day.
Flextime: Implementation of an alternate hours workweek program.	**One peak hour trip will be credited for each employee that is offered the opportunity to work staggered work hours. Those hours can be a set shift set by the employer or can be individually determined by the employee.**	**This is based on staff's best estimate.**
Provision of assistance to employees so they can live close to work.	If an employer develops and offers a program to help employees find acceptable residences within five miles of the employment site, a credit of one trip will be given for each slot in the program.	This assumes that a five-mile trip will generally not involve travel on the freeways.

Implementation of a program that gives preference to hiring local residents at the new development site.	One peak hour trip will be credited for each employment opportunity reserved for employees recruited and hired from within five miles of the employment site.	This assumes that a five-mile trip will generally not involve travel on the freeways.
Provision of on-site amenities/accommodations that encourage people to stay on site during the workday, making it easier for workers to leave their automobiles at home.	**Five** peak hour trips will be credited for each feature added to the job site. Possible features may include: banking grocery shopping clothes cleaning exercise facilities child care center	This is based on staff's best estimate.
Provide use of motor vehicles to employees who use alternate commute methods so they can have access to vehicles during breaks for personal use.	**Five** peak hour trips will be credited for each vehicle provided.	This is based on staff's best estimate.
Provide use of bicycles to employees who use alternate commute methods so they can have access to bicycles during breaks for personal use.	One peak hour trip will be credited for every four bicycles provided.	This is based on staff's best estimate.
Provision of child care services as a part of the development	One trip will be credited for every two child care slots at the job site. This amount increases to one trip for each slot if the child care service accepts multiple age groups (infants=0-2yrs, preschool=3&4 yrs, school-age=5 to 13 yrs).	**This is based on staff's best estimate.**

Developer/property owner may join an employer group to expand available child care within 5 miles of the job site or may provide this service independently	One trip will be credited for each new child care center slot created either directly by an employer group, by the developer/property owner, or by an outside provider if an agreement has been developed with the developer/property owner that makes the child care accessible to the workers at the development.	**This is based on staff's best estimate.**
Join the Alliance's guaranteed ride home program.	**Two** peak hour trips will be credited for every 2 slots purchased in the program.	Experience shows that when a Guaranteed Ride Home Program is added to a TDM program, average ridership increases by about 50%.
Combine any ten of these elements and receive an additional credit for five peak hour trips.	Five peak hour trips will be credited.	Experience has shown that offering multiple and complementary TDM components can magnify the impact of the overall program.
Work with the Alliance to develop/ implement a Transportation Action Plan.	**Ten** peak hour trips will be credited.	This is based on staff's best estimate.
The developer can provide a cash legacy after the development is complete and designate an entity to implement any (or more than one) of the previous measures before day one of occupancy.	Peak hour trip reduction credits will accrue as if the developer was directly implementing the items.	Credits accrue depending on what the funds are used for.
Encourage infill development.	Two percent of all peak hour trips will be credited for each infill development.	Generally acceptable TDM practices (based on research of TDM practices around the nation and reported on the Internet).

Encourage shared parking.	Five peak hour trips will be credited for an agreement with an existing development to share existing parking.	Generally acceptable TDM practices (based on research of TDM practices around the nation and reported on the Internet).
Participate in/create/sponsor a Transportation Management Association.	Five peak hour trips will be credited.	Generally acceptable TDM practices (based on research of TDM practices around the nation and reported on the Internet).
Coordinate Transportation Demand Management programs with existing developments/ employers.	Five peak hour trips will be credited.	This is based on staff's best estimate.
For employers with multiple job sites, institute a proximate commuting program that allows employees at one location to transfer/trade with employees in another location that is closer to their home.	One peak hour trip will be credited for each opportunity created.	Yields a one-to-one ratio.
Pay for parking at park and ride lots or transit stations.	One peak hour trip will be credited for each spot purchased.	Yields a one-to-one ratio.

Additional Measures for Residential Developments

Develop schools, convenience shopping, recreation facilities, and child care centers in new subdivisions.	Five peak hour trips will be credited for each facility included.	This is based on staff's best estimate.
Provision of child care services at the residential development and/or at a nearby transit center	One trip will be credited for every two child care slots at the development/transit center. This amount increases to one trip for each slot if the child care service accepts multiple age groups (infants, preschool, school-age).	**This is based on staff's best estimate.**
Make roads and streets more pedestrian and bicycle friendly.	Five peak hour trips will be credited for each facility included.	This is based on staff's best estimate.
Revise zoning to limit undesirable impacts (noise, smells, and traffic) instead of limiting broad categories of activities.	Five peak hour trips will be credited.	This is based on staff's best estimate.
Create connections for non-motorized travel, such as trails that link dead-end streets.	Five peak hour trips will be credited for each connection make.	This is based on staff's best estimate.
Create alternative transportation modes for travel within the development and to downtown areas - bicycles, scooters, electric carts, wagons, shuttles, etc.	One peak hour trip will be credited for each on-going opportunity created (i.e. five bicycles/ scooters/wagons = five trips, two-seat carts = two trips, seven passenger shuttle = seven trips).	This is based on staff's best estimate.
Design streets/roads that encourage pedestrian and bicycle access and discourage automobile access.	Five trips will be credited for each design element.	This is based on staff's best estimate.
Install and maintain	Five trips will be credited for each	This is based on staff's best

alternative transportation kiosks.	kiosk.	estimate.
Install/maintain safety and security systems for pedestrians and bicyclists.	Five trips will be credited for each measure implemented.	This is based on staff's best estimate.
Implement jitneys/ vanpools from residential areas to downtowns and transit centers.	One trip will be credited for each seat created.	Yields a one-to-one ratio.
Locate residential development within one-third mile of a fixed rail passenger station.	All trips from a residential development within one-third mile of a fixed rail passenger station will be considered credited due to the location of the development.	This is based on staff's best estimate.

The local jurisdiction must also agree to maintain data available for monitoring by C/CAG, that supports the on-going compliance with the agreed to trip reduction measures.

City County Association of Governments * Congestion Mangement Program

Land Use Impact Analysis Program Compliance

August 9, 2011

Jurisdiction	Project	Measures Taken	C/CAG Compliance
Daly City	Landmark Plaza Project	TDM plan incorporated into Draft EIR	TDM Plan approved by C/CAG
Redwood City	Abbott Labs	TDM plan incorporated into Draft EIR	TDM Plan approved by C/CAG
East Palo Alto	YMCA	TDM plan submitted to C/CAG for review	TDM plan approved by C/CAG
Burlingame	Peninsula Medical Center Replacement Project	TDM is included as a condition of approval	TDM Plan approved by C/CAG
Brisbane	One Quarry Road	None yet	None yet
Pacifica	Cypress Walk Residential Project	None yet	None yet
Redwood City	Bayside Gardens	Final EIR states TDM plan will be submitted to C/CAG prior to final project approval	TDM plan to be sent to C/CAG for review
Redwood City	High Tech High Bayshore	TDM provided by the project sponsor	TDM plan approved
Half Moon Bay	Cabrillo Corners Commercial Project	None yet	None yet
Menlo Park	Safeway	TDM plan submitted to C/CAG by consultant	TDM plan will be approved by C/CAG as long as it is included as a condition of approval that is to be met prior to occupancy
Daly City	Westlake Shopping Center	TDM plan is required as a condition of approval to be met prior to occupancy	TDM plan to be submitted to C/CAG for review
South San Francisco	Genentech B 33 & B 37	TDM Plan incorporated into Genentech Corporate Facilities Master Plan	South San Francisco's TDM Ordinance exceeds C/CAG's requirements
South San Francisco	333 Oyster Point Blvd.	TDM plan was incorporated with a requirement to achieve 35% mode shift and was incuded as a condition of approval	South San Francisco's TDM Ordinance exceeds C/CAG's requirements
South San Francisco	Genentech B 31	TDM Plan to be incorporated into Genentech Corporate Facilities Master Plan	South San Francisco's TDM Ordinance exceeds C/CAG's requirements
South San Francisco	180 Oyster point Blvd.	TDM provided by the project sponsor	TDM Plan approved by C/CAG
Foster City	Bayside Towers III	TDM provided by the project sponsor	TDM Plan approved by C/CAG
South San Francisco	681 Gateway Boulevard Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
South San Francisco	Home Depot Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG

City County Association of Governments * Congestion Mangement Program

Land Use Impact Analysis Program Compliance

August 9, 2011

Jurisdiction	Project	Measures Taken	C/CAG Compliance
Redwood City	Stanford Outpatient Center	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
South San Francisco	249 East Grand Ave. Office/R&D Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
South San Francisco	Lowe's Project	TDM provided by the project sponsor	TDM Plan approved by C/CAG
South San Francisco	East Jamie Court Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
South San Francisco	333-351 Allerton Ave. Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
South San Francisco	285 East Grand Ave. Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of San Carlos	Palo Alto Medical Foundation	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of Menlo Park	Sand Hill Road Hotel and Office Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of Brisbane	Sierra Point Project	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of South San Francisco	Terrabay Phase III	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of South San Francisco	213 East Grand Ave.	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of South San Francisco	Hyatt Place Hotel	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of South San Francisco	Britannia Modular Labs 4	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
City of South San Francisco	1070 & 1080 San Mateo Avenue	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG
County of San Mateo	Big Wave Wellness Center and Office Park Project	None yet	None yet
City of South San Francisco	Oyster Point Specific Plan Environmental Impact Report	TDM plan submitted to C/CAG by consultant	TDM Plan approved by C/CAG

APPENDIX J

Regional Transportation Plan Projects

San Mateo County

(In millions of year-of-expenditure dollars)

Reference Number	Project/Program	Total Project Cost	Committed Funds[1]	Discretionary Funds[2]	Project Notes
21602	Reconstruct U.S. 101/Broadway interchange	$ 59.5	$ 28.0	$ 31.5	
21603	Modify U.S. 101/Woodside Road interchange	$ 50.3	$ 30.3	$ 20.0	
21604	Construct auxiliary lanes (one in each direction) on U.S. 101 from Sierra Point to San Francisco County line	$ 6.7	$ 3.2	$ 3.5	
21606	Reconstruct U.S. 101/Willow Road interchange	$ 53.8	$ 53.8	$ 0.0	
21607	Modify University Avenue overcrossing of U.S. 101 to improve operational efficiency and safety (includes widening of overcrossing, constructing new southbound off-ramp and auxiliary lane, and adding bicycle lanes)	$ 6.4	$ 2.1	$ 4.3	
21608	Construct auxiliary lanes (one in each direction) on U.S. 101 from Marsh Road to Embarcadero Road	$ 119.9	$ 119.9	$ 0.0	Partially funded with Proposition 1B Corridor Mobility Improvement Account funds
21609	Improve local access from Sneath Lane and San Bruno Avenue to I-280/I-380 interchange (study phase only)	$ 2.0	$ 2.0	$ 0.0	
21610	Construct auxiliary lanes (one in each direction) on U.S. 101 from San Bruno Avenue to Grand Avenue	$ 57.5	$ 26.6	$ 30.9	
21612	Improve access to/from west side of Dumbarton Bridge on Route 84 connecting to U.S. 101 (includes flyovers, interchange improvements and conversion of Willow Road between Route 84 and U.S. 101 to expressway)	$ 92.4	$ 80.4	$ 12.0	2004 Measure A sales tax project
21613	Improve Route 92 from San Mateo-Hayward Bridge to I-280 (includes widening and uphill passing lane from U.S. 101 to I-280)	$ 85.6	$ 50.6	$ 35.0	2004 Measure A sales tax project
21615	Reconstruct I-280/Route 1 interchange, including ramps	$ 70.0	$ 53.0	$ 17.0	1988 and 2004 Measure A sales tax project
21623	Improve Caltrain stations (includes upgrades/relocation of platforms, new platforms, pedestrian tunnels, pedestrian crossings and parking improvements)	$ 139.0	$ 119.1	$ 19.9	1988 Measure A sales tax project
21624	Implement an incentive program to support transit-oriented developments within 1/2-mile of Caltrain stations that have a minimum density of 40 units per acre	$ 19.6	$ 3.3	$ 16.3	
21626	Implement Caltrain grade separation program in San Mateo County	$ 714.2	$ 629.2	$ 85.0	1988 and 2004 Measure A sales tax project
21892	Widen Woodside Road from 4 to 6 lanes from El Camino Real to Broadway	$ 16.6	$ 7.7	$ 8.9	
21893	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek (includes widening shoulders and travel lanes to standard widths and straightening curves)	$ 40.1	$ 24.5	$ 15.6	

1 Committed Funds have been reserved by law for specific uses, or allocated by MTC action prior to the development of the Transportation 2035 Plan.

2 Discretionary Funds are flexible funds available to MTC (and not already programmed in Committed Funds) for assignment to projects via the Transportation 2035 Plan planning process.

San Mateo County

(In millions of year-of-expenditure dollars)

Reference Number	Project/Program	Total Project Cost	Committed Funds[1]	Discretionary Funds[2]	Project Notes
22120	Construct ferry terminal at Redwood City	$ 15.0	$ 15.0	$ 0.0	
22226	Construct Bayshore Intermodal Facility for Caltrain, Muni light rail, and Muni and SamTrans buses (includes cross-platform transit transfers between Muni Third Street light-rail station and Caltrain Bayshore station)	$ 36.5	$ 27.3	$ 9.2	
22227	Extend Geneva Avenue to the U.S. 101/Candlestick Point interchange (includes Caltrain grade separation at Tunnel Avenue and other local street improvements)	$ 44.2	$ 22.1	$ 22.1	
22229	Reconstruct U.S. 101/Sierra Point Parkway interchange (includes extension of Lagoon Way to U.S. 101)	$ 30.7	$ 26.3	$ 4.4	
22230	Construct auxiliary lanes (one in each direction) on I-280 from I-380 to Hickey Boulevard	$ 87.7	$ 53.6	$ 34.1	2004 Measure A sales tax project
22232	Construct streetscape improvements on Mission Street (Route 82) from John Daly Boulevard to San Pedro Road	$ 3.4	$ 3.4	$ 0.0	
22239	Widen Manor Drive overcrossing at Route 1 (includes new traffic signals at intersection)	$ 22.0	$ 10.1	$ 11.9	2004 Measure A sales tax project
22261	Replace San Pedro Creek Bridge over Route 1	$ 6.8	$ 3.7	$ 3.1	
22268	Provide countywide shuttle service between Caltrain stations and major activity centers (includes purchase of vehicles)	$ 175.0	$ 154.1	$ 20.9	2004 Measure A sales tax project
22271	Widen Skyline Boulevard (Route 35) from 2 to 4 lanes between I-280 and Sneath Lane	$ 6.4	$ 3.9	$ 2.5	
22274	Install an Intelligent Transportation System (ITS) and a Traffic Operation System (TOS) countywide	$ 73.7	$ 39.8	$ 33.9	2004 Measure A sales tax project
22279	Construct new U.S. 101/Produce Avenue interchange (includes replacement of Produce Avenue on- and off-ramps and South Airport Boulevard ramps to U.S. 101 at Wondercolor Lane)	$ 16.4	$ 8.2	$ 8.2	
22282	Improve U.S. 101 operations near Route 92	$ 49.8	$ 23.0	$ 26.8	2004 Measure A sales tax project
22615	Improve station facilities and other rail improvements in Redwood City, Menlo Park and East Palo Alto in conjunction with the Dumbarton Rail Corridor	$ 39.3	$ 39.3	$ 0.0	2004 Measure A sales tax project
22726	Implement ferry service between South San Francisco and Alameda/Oakland	$ 51.2	$ 51.2	$ 0.0	Resolution 3434 Regional Transit Expansion Program

San Mateo County

(In millions of year-of-expenditure dollars)

Reference Number	Project/Program	Total Project Cost	Committed Funds[1]	Discretionary Funds[2]	Project Notes
22751	Improve operations and safety of Route 1 in Half Moon Bay (includes extending Route 1 to Half Moon Bay city limits and channelization at local intersections)	$ 40.8	$ 23.9	$ 16.9	2004 Measure A sales tax project
22756	Reconstruct U.S. 101/Candlestick Point interchange	$ 73.7	$ 51.2	$ 22.5	
94643	Widen Route 92 from Half Moon Bay city limits to Route 1 (includes adding left-turn lanes, signal modifications, shoulders and bicycle lanes)	$ 29.9	$ 29.9	$ 0.0	
94644	Construct westbound slow-vehicle lane on Route 92 from Route 35 to I-280	$ 57.6	$ 45.6	$ 12.0	
94656	Construct Devil's Slide Bypass between Montara and Pacifica	$ 362.6	$ 362.6	$ 0.0	
94667	Provide SamTrans Americans with Disabilities Act (ADA) paratransit services (includes operating support and purchase of new paratransit vehicles)	$ 491.8	$ 491.8	$ 0.0	1998 and 2004 Measure A sales tax project
98176	Construct auxiliary lanes on U.S. 101 from 3rd Avenue to Millbrae and reconstruct U.S. 101/Peninsula interchange	$ 188.2	$ 188.2	$ 0.0	
98204	Add travel lane (one in each direction) on Route 1 (Calera Parkway) between Fassler Avenue and Westport Drive in Pacifica (includes traffic signal coordination on Fassler Avenue and Reina Del Mar Avenue)	$ 44.4	$ 18.0	$ 26.4	
230192	Improve SamTrans bus services (includes enhanced service levels, transit priority measures, signal timing and dedicated bus lanes)	$ 2.5	$ 2.5	$ 0.0	
230349	Improve local access to National Park Service (NPS) lands in San Mateo	$ 151.1	$ 151.1	$ 0.0	
230417	Modify U.S. 101/Holly Street interchange (includes widening eastbound to northbound loop to 2 lanes and eliminating northbound to westbound loop)	$ 3.2	$ 3.2	$ 0.0	
230424	Modify Route 92/El Camino Real interchange	$ 3.0	$ 3.0	$ 0.0	
230428	Extend Blomquist Street over Redwood Creek to East Bayshore and Bair Island Road	$ 5.2	$ 5.2	$ 0.0	
230430	Implement San Mateo's bicycle and pedestrian program	$ 45.0	$ 45.0	$ 0.0	2004 Measure A sales tax project
230434	Implement local circulation improvements and the local streets traffic management program	$ 20.0	$ 20.0	$ 0.0	
230592	Improve streetscape and traffic calming along Bay Road, and construct new northern access connection between Demeter Street and University Avenue	$ 14.8	$ 14.8	$ 0.0	
230697	Local streets and roads maintenance	$ 3,089.0	$ 1,503.0	$ 729.0	Shortfall remains
230704	Make Route 92 operational improvements to Chess Drive on-ramps	$ 2.5	$ 2.5	$ 0.0	

1 Committed Funds have been reserved by law for specific uses, or allocated by MTC action prior to the development of the Transportation 2035 Plan.

2 Discretionary Funds are flexible funds available to MTC (and not already programmed in Committed Funds) for assignment to projects via the Transportation 2035 Plan planning process.

APPENDIX K

Checklist for Modeling Consistency

MTC Checklist for Modeling Consistency for CMPs

2011 Submittal

Prepared for City/County Association of Governments of San Mateo County

In cooperation with the Santa Clara Valley Transportation Authority

October 24, 2011

Introduction

The purpose of this document is to provide the checklist of deliverables requested by the Metropolitan Transportation Commission (MTC) to establish that the City/County Association of Governments of San Mateo County (C/CAG) travel demand models apply a regionally consistent model set for the development of travel demand forecasts. The specific checklist of product deliverables was defined by MTC in the *2011 County Congestion Management Plans: Updated MTC Guidance and Review Process Resolution No. 3000, Revised*, Attachment B. The required checklist products are provided in the following sections.

Product 1

Description of the C/CAG Model

The current C/CAG model had its origin in the corridor model developed for the Grand Boulevard Initiative (GBI) Multi-model Corridor Study by the Santa Clara VTA in 2009. The GBI study evaluated the impacts of enhanced transit service (bus rapid transit) and enhanced developed strategies in the El Camino Real corridor to transform an existing auto-oriented commercial transportation corridor into a more transit-oriented, mixed-use transportation corridor. The GBI model was essentially the VTA Countywide model with added zone and network detail to improve upon what was network and zone detail based on the MTC regional models for San Mateo County. The basis for the network and zone refinements applied within San Mateo County was the C/CAG Countywide models originally developed in the mid-1990s.

For the updated C/CAG model development, the GBI model was revised to produce an updated base year 2005 calibration and validation with selected model enhancements. These enhancements included calibration of the auto ownership models to American Community Survey (ACS) 2005 county-level data, addition of bicycle network infrastructure (bike lanes and paths) in the networks, travel time skims, mode choice and bicycle assignments and development of a toll modeling procedure to estimate

express lane vehicle volumes. The model was validated to year 2005 screenline volumes for the AM and PM peak periods and to year 2005 observed transit boardings.

Consistency with MTC Model

As noted previously, the C/CAG model was designed to be consistent with the previous MTC Travel Demand Model forecasting system BAYCAST-90 model. This section provides a general overview of the C/CAG models and also describes several basic modeling characteristics that are shared between the models.

Transportation Analysis Zones (TAZ's) — The current CMP model has a more refined zone system in San Mateo County and Santa Clara County than the MTC regional models. Additional zones were added to more accurately reflect and support the added roadway network and to provide more detail in transit rich corridors and dense central business districts. In all, an additional 156 zones were added in San Mateo County and an additional 1,122 zones were added in Santa Clara County. The new model maintains the use of MTC's zone system in the remaining seven Bay Area counties, but enlarges the full model region and zones to include Santa Cruz, San Benito, Monterey, and San Joaquin Counties.

Highway Network and Transit Network — The roadway network used by the C/CAG model includes additional detail in both San Mateo and Santa Clara Counties. The current CMP model also includes detailed stop, station and route detail in the transit network for San Mateo and Santa Clara Counties, and maintains the MTC roadway and transit networks in the remaining Bay Area counties. The Association of Monterey Bay Area Governments (AMBAG) provided the basis for roadway networks in Monterey, San Benito, and Santa Cruz counties and the San Joaquin County COG provided roadways for San Joaquin County, however, the detailed networks was simplified to match the coarser zone structure in each of those four added counties. Express lane facilities, representing the MTC 'Backbone' express lanes system for 2035, were also coded in the network with a toll facility indicator based on the highway corridor segment and the direction of travel. Differential toll facility codes were required in order to apply specific toll rates to optimize utilization of the express lanes to preserve level-of-service for free carpool users. The C/CAGmodel also includes a representation of the bicycle network infrastructure in the base year and 2035 forecast year for San Mateo, Santa Clara, San Francisco and southern Alameda Counties, explicitly representing existing and future bike lanes and bike paths in travel time development, mode choice and bicycle assignments.

Capacities and Speed — The current C/CAG model incorporates the area type and assignment group classification system published by MTC in BAYCAST-90. Input free-flow speeds for expressways are slightly lower in the C/CAG models to more accurately match the travel time for the expressway segments during model validation and improve the assignment match of estimated to observed expressway volumes.

Trip Purposes — The current C/CAG model uses the same trip purposes used in the BAYCAST-90 model and also uses additional trip purposes not modeled by MTC. C/CAG model trip purposes include the following:

- Home-based work trips
- Home-based shop and other trips
- Home-based social/recreation trips
- Non-home-based trips
- Home-based school: grade school, high school, and college trips
- Light, medium and heavy duty internal to internal zone truck trips

The C/CAG model uses MTC BAYCAST-90 trip generation equations for trip production and trip attraction functions for all trip purposes listed above. In order to address special markets not included in the MTC trip purposes, the C/CAG model includes several additional trip purposes beyond those modeled by MTC, including:

- Air-passenger trips to San Francisco Intenational (SFO) Airport and San Jose/Mineta International Airport (SJC) and
- Light, medium and heavy-duty external truck trips

Market Segments — The C/CAG model adopts the BAYCAST-90 disaggregate travel demand model four income group market segments for the home-based work trip purpose in trip generation, distribution and mode choice. In addition, the C/CAG model also maintains the three workers per household (0, 1 and 2+ workers) and three auto ownership markets (0, 1 and 2+ autos owned) used in the MTC worker/auto ownership models. Trips by peak and off-peak time period are also stratified in the trip distribution, mode choice and highway and transit assignment models.

External Trips — The C/CAG model uses a different approach for incorporating inter-regional commuting estimates than MTC. For external zones coincident with the MTC model, MTC interregional vehicle volumes were applied for base year 2000 and adjusted to the future by assuming a 1 percent growth rate per year. For external gateways from San Joaquin County and Santa Cruz, Monterey and San Benito Counties, the incorporation of those counties as internal modeled areas obviated the development of external vehicle volumes for those areas of the C/CAG models.

Pricing — The C/CAG model uses MTC pricing assumptions for transit fares, bridge tolls, parking charges, and auto operating costs as assumed in the current MTC Regional Transportation Plan (RTP) and Sustainable Community Strategies (SCS) update. All prices are expressed in year 1990 dollar values in the models. The C/CAG model also uses regional express lane toll charges for the AM and PM peak periods that are based on optimizing the level-of-service in the carpool lanes. Depending on the level of utilization, these toll charges would vary by direction, time of day and by specific corridor.

Auto Ownership — The current C/CAG model applies BAYCAST-90 for auto ownership models to estimate the number of households with 0, 1, and 2+ autos by four income groups in each traffic analysis zone. Walk to transit accessibility measures were incorporated in the auto ownership models consistent with MTC BAYCAST-90 to more logically associate low auto ownership households with transit services. The auto ownership models were recently calibrated to the 2005-2009 American Community Survey to match workers per household and auto ownership by county.

Mode Choice — The mode choice models for BAYCAST-90 include the use of nested structures for most trip purposes, however, explicit estimation of nested structures to consider transit submodes were not included in the model specification.[1] The C/CAG model adds a nesting structure for transit submodes of local bus, express bus, Bus Rapid Transit (BRT), light rail, heavy rail and commuter rail underneath the MTC BAYCAST-90 nested structures. Consistent with the BAYCAST-90, mode choice coefficients are preserved by constraining the model to the BAYCAST-90 parameters, except those in transit submode structure.[2] The C/CAG model includes a transit submode nest for Bus Rapid Transit (BRT), which is an emerging transit technology in the region. Submode constants for BRT were developed from a market analysis and state preference survey that compared the relative tradeoffs between bus, light rail and hypothetical BRT service. The resulting BRT constants were between the calibrated submode constants applied to local bus service and light rail service, implying that BRT service is perceived as more attractive than local bus service, but not as attractive as light rail service.

Peak Hour and Peak Periods for Highway Assignments —The highway assignments produce AM and PM peak hour volumes, AM and PM peak period volumes (5 AM to 9 AM and 3 PM to 7 PM, respectively – each coincident with the time periods of operation for carpool lanes), midday volumes (9 AM to 3 PM) and evening volumes (7 PM to 5 AM). The four time period volumes are then added together to develop daily vehicle volumes.

Vehicle and Transit Assignments — The current C/CAG model incorporates a methodology analogous to the MTC "layered," equilibrium assignment process, which distinguishes standard mixed-flow lanes from high-occupancy-vehicle (HOV) lanes. The equilibrium assignment process used in the current CMP model is functionally equivalent to the MTC methodology. The C/CAG model includes additional vehicle classes in the highway assignments for park-and-ride vehicles and drive-alone and carpool toll vehicles.

Drive-alone and carpool toll vehicles for AM and PM peak periods are estimated using a toll model post-processor that estimates toll volumes based on a comparison of the non-toll and toll travel times and costs. This procedure assumes that toll choice occurs after the decision to choose auto versus transit has already been considered, and therefore does not influence transit mode choice. A toll choice constant for drive-alone and carpool modes was developed based on a calibration of toll volumes estimated by application of the toll model to the I-680 Express Lane facility and comparison of estimated to observed express lane volumes. It should be noted that by 2035, in order to maintain the operational feasibility of implementing regional express toll lanes, it was assumed that only 3+ occupant carpools

[1] A nested structure partitions the alternatives into groups (nests) of similarity. The groups can be further generalized into subgroups (subnests) and so on, which has the form of an inversed tree.

would be allowed to travel in the carpool lanes for free. This was assumed for all carpool facilities in the C/CAG model region.

In the current CMP model, transit passengers are assigned with a methodology analogous to that used by MTC, with separate assignments for each transit submode and access mode. Assignments are also performed separately for peak and off-peak conditions. A total of eighteen separate transit assignments are run to cover the full combination of transit submode and access modes as well as to estimate transit ridership for air-passengers and external home-based work transit trips from the San Joaquin (ACE, BART and San Joaquin SMART bus) and AMBAG (Caltrain and Monterey Express) model regions.

Model Validation with 2005 Traffic and Transit Volumes — The current C/CAG model is validated to year 2005 traffic volumes for county-level screenlines and specific major transportation facilities. Two time periods are validated for county screenlines: AM peak period (5 AM to 9 AM) and PM peak period (3 PM to 7 PM). Peak hour validation was performed for US 101 and SR 82 (El Camino Real) using traffic counts provided by Caltrans. Daily transit boardings were validated for the year 2005 at the system level for major regional transit operators (Caltrain, BART, MUNI, VTA and AC Transit) and at the route level for SamTrans express and local routes.

Product 2

Description of Demographic Forecasts

The C/CAG model uses the Association of Bay Area Governments (ABAG) Projections 2009 data series for the base year 2005 and the ABAG Current Regional Plans scenario as the basis for the 2035 long-range forecasts for San Mateo County, as provided by MTC at the MTC 1454 zone level. The MTC zone level allocations were sub-allocated to the smaller C/CAG zones (including finer zones for both San Mateo and Santa Clara Counties) based on local development information and parcel level data. As such, the C/CAG socioeconomic data inputs are consistent at both the MTC zone level and the ABAG census tract level, however, slight differences do exist in San Mateo and Santa Clara Counties due to rounding errors resulting from the allocation process. Key ABAG land use variables used in the San Mateo C/CAG models do not differ by more than one percent at the county level for any of the 9 MTC region counties. No differences exist at the census tract level outside of San Mateo and Santa Clara Counties for any of the remaining MTC counties.

Product 3

ABAG County-Level Estimates for Population, Households, Jobs, and Employed Residents Year 2005, Current Regional Plans (v 0.1)

ABAG Projections 2009

County	Population	Households	Jobs	Employed Residents
San Francisco	795,792	338,923	553,073	388,097
San Mateo	721,890	260,066	337,344	318,599
Santa Clara	1,762,986	595,720	872,820	733,989
Alameda	1,505,308	543,776	730,264	705,906
Contra Costa	1,023,390	368,323	379,021	459,606
Solano	421,600	142,039	150,513	194,903
Napa	133,695	49,256	70,690	64,102
Sonoma	479,203	181,786	220,442	237,700
Marin	252,605	103,188	135,473	122,204
Bay Area	7,096,469	2,583,077	3,449,640	3,225,106

San Mateo C/CAG Trip-based Models

County	Population	Households	Jobs	Employed Residents
San Francisco	795,792	338,923	553,073	388,097
San Mateo	721,900	260,072	337,313	319,235
Santa Clara	1,762,957	595,716	872,248	733,965
Alameda	1,505,308	543,776	730,264	705,906
Contra Costa	1,023,390	368,323	379,021	459,606
Solano	421,600	142,039	150,514	194,903
Napa	133,695	49,256	70,690	64,102
Sonoma	479,203	181,786	220,442	237,700
Marin	252,605	103,188	135,473	122,204
Bay Area	7,096,450	2,583,079	3,449,038	3,225,718

Percent Difference

County	Population	Households	Jobs	Employed Residents
San Francisco	0.00%	0.00%	0.00%	0.00%
San Mateo	0.00%	0.00%	-0.01%	0.20%
Santa Clara	0.00%	0.00%	-0.07%	0.00%
Alameda	0.00%	0.00%	0.00%	0.00%
Contra Costa	0.00%	0.00%	0.00%	0.00%
Solano	0.00%	0.00%	0.00%	0.00%
Napa	0.00%	0.00%	0.00%	0.00%
Sonoma	0.00%	0.00%	0.00%	0.00%
Marin	0.00%	0.00%	0.00%	0.00%
Bay Area	0.00%	0.00%	-0.02%	0.02%

Product 3, continued

ABAG County-Level Estimates for Population, Households, Jobs, and Employed Residents Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

County	Population	Households	Jobs	Employed Residents
San Francisco	980,071	417,997	698,793	472,195
San Mateo	893,067	322,624	442,850	392,101
Santa Clara	2,433,531	827,254	1,212,948	1,054,001
Alameda	1,958,248	705,343	906,300	963,499
Contra Costa	1,323,390	480,474	469,462	603,803
Solano	504,331	171,284	173,057	220,100
Napa	148,517	54,642	86,961	71,000
Sonoma	572,443	212,784	262,078	258,396
Marin	269,179	110,673	147,872	102,999
Bay Area	9,082,777	3,303,075	4,400,321	4,138,094

San Mateo C/CAG Trip-based Models

County	Population	Households	Jobs	Employed Residents
San Francisco	980,071	417,997	698,793	472,195
San Mateo	893,066	322,620	442,858	392,097
Santa Clara	2,433,551	827,261	1,212,959	1,054,016
Alameda	1,958,248	705,343	906,300	963,499
Contra Costa	1,323,390	480,474	469,462	603,803
Solano	504,331	171,284	173,057	220,100
Napa	148,517	54,642	86,961	71,000
Sonoma	572,443	212,784	262,078	258,396
Marin	269,179	110,673	147,872	102,999
Bay Area	9,082,796	3,303,078	4,400,340	4,138,105

Percent Difference

County	Population	Households	Jobs	Employed Residents
San Francisco	0.00%	0.00%	0.00%	0.00%
San Mateo	0.00%	0.00%	0.00%	0.00%
Santa Clara	0.00%	0.00%	0.00%	0.00%
Alameda	0.00%	0.00%	0.00%	0.00%
Contra Costa	0.00%	0.00%	0.00%	0.00%
Solano	0.00%	0.00%	0.00%	0.00%
Napa	0.00%	0.00%	0.00%	0.00%
Sonoma	0.00%	0.00%	0.00%	0.00%
Marin	0.00%	0.00%	0.00%	0.00%
Bay Area	0.00%	0.00%	0.00%	0.00%

Product 4

Identification of Differences between CMA and ABAG Census Tract Level

C/CAG socioeconomic data inputs are consistent at both the MTC zone level and the ABAG census tract level for the Current Regional Plans scenario for the year 2035. The MTC zone level data was provided by MTC subsequent to a meeting of the Regional Model Working Group [3]. Data at the MTC zone level in San Mateo and Santa Clara Counties was allocated to the smaller San Mateo C/CAG model zones using local land use development patterns, however, MTC zone level, and by default ABAG census-tract level, control totals were preserved in the allocation process.

[3] Provided by email from MTC to the Regional Model Working Group members on March 25, 2011.

Product 5

Region-Level Auto Operating Cost, Key Transit Fares and Bridge Tolls Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

Pricing Assumption	2035 Value in 2000 dollars	2035 Value in 2010 dollars
Auto Operating Cost per Mile	$0.222	$0.280
Bridge Tolls	Toll schedule starting July 1, 2012	Toll schedule starting July 1, 2012
Transit Fares	---	---
Muni Local Bus	$1.606	$2.000
AC Transit Local Bus	$1.606	$2.000
VTA Local Bus	$1.606	$2.000
SamTrans Local Bus	$1.606	$2.000

San Mateo C/CAG Trip-based Models

Pricing Assumption	2035 Value in 2000 dollars[4]	2035 Value in 2010 dollars[5]
Auto Operating Cost per Mile [6]	$0.24	$0.30
Bridge Tolls	Toll schedule starting July 1, 2010	Toll schedule starting July 1, 2010
Transit Fares	---	---
Muni Local Bus	$1.55	$1.97
AC Transit Local Bus	$1.55	$1.97
VTA Local Bus	$1.55	$1.97
SamTrans Local Bus	$1.55	$1.97

[4] Source for Inflation Rates : http://www.bls.gov/data/inflation_calculator.htm

[5] Source for Inflation Rates : http://www.bls.gov/data/inflation_calculator.htm

[6] Source: *Plan/Bay Area: Technical Summary of Predicted Traveler Responses to First Round Scenarios, Technical Report*, Metropolitan Transportation Commission, March 22, 2011, p.14.

Product 6

Highway Network and Transit Network — The roadway network used by the San Mateo C/CAG model includes additional detail in both San Mateo and Santa Clara Counties. The current CMP model also includes detailed stop, station and route detail in the transit network for San Mateo and Santa Clara Counties, and maintains the MTC roadway and transit networks in the remaining Bay Area counties. The Association of Monterey Bay Area Governments (AMBAG) provided the basis for roadway networks in Monterey, San Benito, and Santa Cruz counties and the San Joaquin County COG provided roadways for San Joaquin County, however, the detailed networks was simplified to match the coarser zone structure in each of those four added counties. Express lane facilities, representing the MTC 'Backbone' express lanes system for 2035, were also coded in the network with a toll facility indicator based on the highway corridor segment and the direction of travel. Differential toll facility codes were required in order to apply specific toll rates to optimize utilization of the express lanes to preserve level-of-service for free carpool users.

For model consistency reporting purposes, the San Mateo C/CAG models assume committed project as defined in the MTC 2035 Regional Transportation Plan in San Mateo County and all other counties, with the exception that HOV lanes are assumed on US 101 from Whipple Road north the San Mateo/San Francisco County line by conversion of the auxiliary lanes. The 2035 forecasts produced by the San Mateo C/CAG models also assumes that only 3+ person carpools are allowed to travel in the carpool lanes without a charge for the entire model region. The C/CAG model includes a representation of the bicycle network infrastructure in the base year and 2035 forecast year for San Mateo, Santa Clara, San Francisco and southern Alameda Counties, explicitly representing existing and future bike lanes and bike paths in travel time development, mode choice and bicycle assignments.

Product 7
Households by Number of Automobiles, by County
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

County	Zero	One	Two +	Total	Zero	One	Two +	Total
San Francisco	132,684	192,192	116,364	441,240	30.1%	43.6%	26.4%	100.0%
San Mateo	18,812	116,608	198,216	333,636	5.6%	35.0%	59.4%	100.0%
Santa Clara	62,264	268,396	528,788	859,448	7.2%	31.2%	61.5%	100.0%
Alameda	86,828	235,696	415,844	738,368	11.8%	31.9%	56.3%	100.0%
Contra Costa	19,860	153,448	317,904	491,212	4.0%	31.2%	64.7%	100.0%
Solano	10,868	50,216	121,300	182,384	6.0%	27.5%	66.5%	100.0%
Napa	4,044	19,240	37,200	60,484	6.7%	31.8%	61.5%	100.0%
Sonoma	14,996	68,860	146,316	230,172	6.5%	29.9%	63.6%	100.0%
Marin	6,992	43,332	72,116	122,440	5.7%	35.4%	58.9%	100.0%
ALL	357,348	1,147,988	1,954,048	3,459,384	10.3%	33.2%	56.5%	100.0%

San Mateo C/CAG Trip-based Models

County	Zero	One	Two +	Total	Zero	One	Two +	Total
San Francisco	130,076	170,563	117,323	417,962	31.1%	40.8%	28.1%	100.0%
San Mateo	25,297	113,422	183,777	322,496	7.8%	35.2%	57.0%	100.0%
Santa Clara	73,775	250,650	501,913	826,338	8.9%	30.3%	60.7%	100.0%
Alameda	116,722	257,910	330,664	705,296	16.5%	36.6%	46.9%	100.0%
Contra Costa	33,991	159,328	287,157	480,476	7.1%	33.2%	59.8%	100.0%
Solano	8,270	49,035	113,991	171,296	4.8%	28.6%	66.5%	100.0%
Napa	2,771	17,703	34,167	54,641	5.1%	32.4%	62.5%	100.0%
Sonoma	13,600	75,388	123,801	212,789	6.4%	35.4%	58.2%	100.0%
Marin	5,004	41,293	64,354	110,651	4.5%	37.3%	58.2%	100.0%
ALL	409,506	1,135,292	1,757,147	3,301,945	12.4%	34.4%	53.2%	100.0%

Product 8
Number of Trips by Tour Purpose
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

Purpose	Tour-based	Share
Work	9,095,396	30.2%
University	674,228	2.2%
School	3,182,584	10.6%
At-Work	2,146,148	7.1%
Eat Out	1,269,852	4.2%
Escort	2,878,708	9.6%
Shopping	4,323,304	14.3%
Social	921,024	3.1%
Other	5,650,824	18.7%
ALL	30,142,068	100.0%

San Mateo C/CAG Trip-based Models

Purpose	Trip-based	Share
Home-based Work	6,257,144	23.3%
Home-based Shopping/Other	7,481,587	27.9%
Home-based Social-Recreational	3,211,923	12.0%
Non-home-based	7,417,766	27.7%
Home-based College	576,940	2.2%
Home-based High School	558,042	2.1%
Home-based Elementary School	1,316,026	4.9%
ALL	26,819,428	100.0%

Product 9
Average Trip Distance by Tour Purpose
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

Tour Purpose	Average Trip Distance, Miles
Work	10.40
University	6.84
School	3.96
At-Work	3.35
Eat Out	5.42
Escort	4.34
Shopping	4.20
Social	4.87
Other	5.00
All	6.25

San Mateo C/CAG Trip-based Models

Trip Purpose	Average Trip Distance, Miles
Home-based Work	12.80
Home-based Shopping/Other	6.91
Home-based Social-Recreational	7.45
Non-home-based	6.75
Home-based College	10.52
Home-based High School	4.85
Home-based Elementary School	4.06
ALL	8.20

Product 10
Journey to Work, County-to-County Usual Workplace
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

Origin County	San Francisco	San Mateo	Santa Clara	Alameda	Contra Costa	Solano	Napa	Sonoma	Marin	All
San Francisco	358,844	55,696	5,884	31,312	7,080	708	312	1,112	12,428	473,376
San Mateo	82,972	206,644	63,104	29,564	4,416	324	156	516	5,152	392,848
Santa Clara	12,508	57,712	915,460	71,272	4,960	196	80	72	780	1,063,040
Alameda	119,536	70,684	130,732	558,332	68,668	3,272	1,240	1,068	12,576	966,108
Contra Costa	64,288	16,448	17,164	139,560	315,164	18,848	5,512	2,596	19,012	598,592
Solano	11,408	2,212	1,108	15,512	31,900	126,024	17,728	5,572	8,060	219,524
Napa	2,020	484	176	2,556	4,408	7,428	44,116	7,844	3,104	72,136
Sonoma	4,948	1,204	212	1,844	1,988	2,196	8,172	215,416	20,828	256,808
Marin	20,756	3,992	512	6,240	4,676	1,052	872	6,544	58,796	103,440
Bay Area	677,280	415,076	1,134,352	856,192	443,260	160,048	78,188	240,740	140,736	4,145,872

San Mateo C/CAG Trip-based Models

Origin County	San Francisco	San Mateo	Santa Clara	Alameda	Contra Costa	Solano	Napa	Sonoma	Marin	All
San Francisco	352,045	48,851	17,360	22,807	6,088	716	578	2,434	11,508	462,387
San Mateo	86,314	229,097	52,114	21,146	2,910	721	194	1,824	2,254	396,574
Santa Clara	18,879	61,803	934,384	58,247	6,404	2,571	580	4,993	2,925	1,090,785
Alameda	124,842	60,321	93,259	605,272	60,016	6,869	1,618	6,525	14,239	972,960
Contra Costa	63,679	9,479	14,024	110,362	354,358	16,113	4,175	3,790	20,254	596,234
Solano	10,779	2,117	1,626	11,086	24,916	134,855	13,836	5,871	7,383	212,470
Napa	1,202	333	249	929	1,827	5,091	55,957	4,167	1,279	71,035
Sonoma	5,443	738	745	1,210	1,368	1,676	2,897	220,959	20,267	255,302
Marin	20,699	1,661	552	2,765	2,208	587	389	4,570	68,789	102,220
Bay Area	683,882	414,400	1,114,313	833,823	460,095	169,199	80,225	255,133	148,897	4,159,967

Product 11
Region-Level Mode Share by Tour Purpose
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

Tour Purpose	Automobile	Walk	Bicycle	Transit	All Modes
Work	81.8%	5.3%	1.5%	11.3%	100.0%
University	63.7%	13.8%	1.3%	21.2%	100.0%
School	69.6%	20.7%	1.6%	8.1%	100.0%
At-Work	69.4%	29.3%	0.7%	0.6%	100.0%
Eat Out	81.1%	15.4%	1.3%	2.3%	100.0%
Escort	93.8%	5.7%	0.3%	0.2%	100.0%
Shopping	87.0%	10.0%	1.1%	2.0%	100.0%
Social	78.7%	15.8%	1.7%	3.8%	100.0%
Other	85.6%	10.2%	1.5%	2.7%	100.0%
All Purposes	81.7%	11.2%	1.3%	5.8%	100.0%

San Mateo C/CAG Trip-based Models

Trip Purpose	Automobile	Walk	Bicycle	Transit	All Modes
Home-based Work	83.5%	3.4%	1.3%	11.8%	100.0%
Home-based Shopping/Other	84.1%	9.9%	0.7%	5.3%	100.0%
Home-based Social-Recreational	81.2%	10.7%	3.6%	4.5%	100.0%
Non-home-based	82.5%	12.9%	0.9%	3.7%	100.0%
Home-based College	66.6%	9.3%	5.3%	18.8%	100.0%
Home-based High School	55.5%	21.4%	4.4%	18.7%	100.0%
Home-based Grade School	52.9%	31.2%	6.3%	9.6%	100.0%
All Purposes	80.7%	12.5%	1.7%	5.1%	100.0%

Product 12
Region-Level VMT and VHT by Facility Type and Time Period
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

VMT

	Facility Type					
Time Period	Freeways	Expressways	Major Arterials	Collectors	Other	All Facilities
Early AM (3 a.m. - 6 a.m.)	5,504,092	544,464	1,158,156	381,730	354,247	7,942,689
AM Peak (6 a.m. - 10 a.m.)	26,675,579	2,918,973	9,919,154	3,048,868	3,437,135	45,999,709
Midday (10 a.m. - 3 p.m.)	26,067,097	3,063,934	10,925,935	3,047,571	4,407,032	47,511,570
PM Peak (3 p.m. - 7 p.m.)	28,630,722	3,380,237	12,261,677	3,558,105	4,461,626	52,292,367
Evening (7 p.m. - 3 a.m.)	17,572,988	1,820,157	5,900,622	1,744,592	2,237,126	29,275,485
Daily	104,450,478	11,727,765	40,165,545	11,780,866	14,897,167	183,021,820

VHT

	Facility Type					
Time Period	Freeways	Expressways	Major Arterials	Collectors	Other	All Facilities
Early AM (3 a.m. - 6 a.m.)	90,089	11,137	34,596	13,125	22,837	171,784
AM Peak (6 a.m. - 10 a.m.)	565,113	69,017	331,877	119,925	208,660	1,294,591
Midday (10 a.m. - 3 p.m.)	461,465	65,853	357,347	118,317	254,178	1,257,160
PM Peak (3 p.m. - 7 p.m.)	600,243	80,725	419,721	147,321	256,638	1,504,646
Evening (7 p.m. - 3 a.m.)	294,320	37,677	183,263	61,581	129,425	706,267
Daily	2,011,229	264,408	1,326,803	460,269	871,738	4,934,448

San Mateo C/CAG Trip-based Models

VMT

	Facility Type					
Time Period	Freeways	Expressways	Major Arterials	Collectors	Other	All Facilities
AM Peak (5 a.m. - 9 a.m.)	23,254,078	2,296,635	7,889,177	1,803,260	4,748,694	39,991,844
Midday (9 a.m. - 3 p.m.)	33,882,129	2,808,072	9,945,821	2,488,415	7,186,680	56,311,117
PM Peak (3 p.m. - 7 p.m.)	28,035,161	3,460,308	12,253,081	3,003,551	6,555,756	53,307,857
Evening (7 p.m. - 5 a.m.)	21,284,834	1,507,476	4,050,705	1,024,120	1,024,120	28,891,255
Daily	106,456,202	10,072,491	34,138,784	8,319,346	19,515,250	178,502,073

VHT

	Facility Type					
Time Period	Freeways	Expressways	Major Arterials	Collectors	Other	All Facilities
AM Peak (5 a.m. - 9 a.m.)	557,271	77,891	294,386	100,785	195,611	1,225,944
Midday (9 a.m. - 3 p.m.)	655,232	86,735	369,138	141,306	292,117	1,544,528
PM Peak (3 p.m. - 7 p.m.)	812,268	127,094	524,676	199,404	284,232	1,947,674
Evening (7 p.m. - 5 a.m.)	345,015	41,581	139,328	44,753	129,816	700,493
Daily	2,369,786	333,301	1,327,528	486,248	901,776	5,418,639

Product 13
Region-Level Average Speed (VMT/VHT) by Facility Type and Time Period
Year 2035, Current Regional Plans (v 0.1)

MTC Tour-based Models

	Facility Type		
Time Period	Freeways	All Other Facilities	All Facilities
Early AM (3 a.m. - 6 a.m.)	61.1	29.9	46.2
AM Peak (6 a.m. - 10 a.m.)	47.2	26.5	35.5
Midday (10 a.m. - 3 p.m.)	56.5	27.0	37.8
PM Peak (3 p.m. - 7 p.m.)	47.7	26.2	34.8
Evening (7 p.m. - 3 a.m.)	59.7	28.4	41.5
Daily	51.9	26.9	37.1

San Mateo C/CAG Trip-based Models

	Facility Type		
Time Period	Freeways	All Other Facilities	All Facilities
AM Peak (5 a.m. - 9 a.m.)	41.7	25.0	32.6
Midday (9 a.m. - 3 p.m.)	51.7	25.2	36.5
PM Peak (3 p.m. - 7 p.m.)	34.5	22.3	27.4
Evening (7 p.m. - 5 a.m.)	61.7	21.4	41.2
Daily	44.9	23.6	32.9

APPENDIX L

Traffic Impact Analysis (TIA) Policy

C/CAG

CITY/COUNTY ASSOCIATION OF GOVERNMENTS
OF SAN MATEO COUNTY

Atherton • Belmont • Brisbane • Burlingame • Colma • Daly City • East Palo Alto • Foster City • Half Moon Bay • Hillsborough • Menlo Park
Millbrae • Pacifica • Portola Valley • Redwood City • San Bruno • San Carlos • San Mateo • San Mateo County • South San Francisco • Woodside

Policy on Traffic Impact Analysis (TIA) To Determine Traffic Impacts on the Congestion Management Program (CMP) Roadway Network Resulting From Roadway Changes, General Plan Updates, and Land Use Development Projects

August 10, 2006

Section I
INTRODUCTION

As the Congestion Management Agency for San Mateo County, C/CAG is responsible for maintaining the performance and standards of the Congestion Management Program (CMP) roadway network. The CMP roadway network is of countywide significance, and their performance must be preserved.

Traffic Impact Analysis (TIA) is the term used in the study of the expected effects of projects and land use decisions on transportation facilities. The study's purpose is to determine whether the transportation system can accommodate the traffic generated by the projects or land use decisions. And to help decision makers to make improvements needed to the roadways, bike routes, sidewalks, and transit services affected by the project. This helps decision makers determine whether to approve the project and what conditions to impose on the project.

This document includes the following sections:

- Section I: Introduction
- Section II: Definition & Purpose
- Section III: Policy
    1. Roadway Modification Projects
    2. General Plan and Specific Plans
    3. Land Use Development Projects
- Section IV: Scope and Parameters of Traffic Impact Analysis
- Section V: Definition of CMP Impact

Section II
DEFINITION & PURPOSE

Definition

This document states policy and establishes procedures to determine cumulative capacity impacts on the CMP roadway network (impacts on the quality of traffic services) from the following three types of projects:

1. **Roadway modification projects**:
   a. Projects that change the traffic capacity of CMP roadway.
   b. Projects near the CMP roadway and impact the CMP roadway network.
2. **General Plan and Specific Plans**.
   a. New General Plan or General Plan updates which include land use changes that would cause an impact on the CMP roadway network.
   b. Specific Plans, Specific Area Plans, Precise Plans, which include land use changes that would cause an impact on the CMP roadway network.
3. **Land use development project**.

Purpose

The purpose of this policy is to ensure uniform procedures for performing Traffic Impact Analysis to evaluate impacts on the CMP roadway resulting from land use and project decisions in San Mateo County.

The intent of this policy is to preserve acceptable performance on the CMP roadway network, and to establish community standards for consistent system-wide transportation review. Preservation of CMP roadway and intersection performance will require an evaluation of the near and long term impacts of General Plan updates**,** land use development proposals, as well as proposed roadway modifications that will either reduce the capacity of the CMP network, or cause additional traffic on the CMP network.

It is not intended that the Traffic Impact Analysis guided by this document will provide all information required for California Environmental Quality Act (CEQA) purposes. Traffic impact analysis to determine traffic impacts on the CMP network may be conducted as part of the CEQA process.

This policy will be reviewed and integrated into the 2007 Congestion Management Program for San Mateo County. It will be reviewed subsequently in two years.

Section III
POLICY

This policy provides an avenue to assess the cumulative traffic impacts on the Congestion Management (CMP) roadway network, of General Plan decisions made by local jurisdictions. It provides direction to local jurisdictions on how to analyze CMP traffic impacts resulting from roadway changes or land use decisions, determine feasible and appropriate mitigations.

Land use development proposals and proposed roadway modifications must be consistent with the jurisdiction's adopted General Plan, unless the proposal is to be amended into the General Plan before final approval by the jurisdiction. Local jurisdictions must evaluate traffic impacts of proposed revisions to their jurisdiction-wide General Plans and Specific Area Plans on the CMP network.

1. Roadway Modification Projects

Project sponsor, in consultation with C/CAG staff, shall determine if a roadway modification project on or near a CMP roadway will have potential near-term and long-term traffic impacts on the CMP roadway network. Section 4, *Scope and Parameters of Traffic Impact Analysis*, and more specifically the definition of impacts in Section 5, *Definition of CMP Impacts* should be used in developing initial thresholds (e.g. change in intersection or lane volumes) to determine significant traffic impacts on a CMP roadway.

If initial assessment indicates that significant traffic impact on the CMP network may result from the proposed project, its sponsor must conduct traffic impact analysis consistent with this policy to determine traffic impacts on the CMP roadway system. Moreover, a travel demand forecasting model must be used to determine long-term traffic impacts if the project is to modify the CMP roadway. See "Travel Demand Forecasting" requirements below. For near term analysis, if the travel demand forecasting model does not provide the level of detail desired, then the use of manual assignment models, micro-simulation models or other tools to provide a more detailed and informative analysis of a roadway project is acceptable.

Mitigation:

Proposed roadway changes to the CMP roadway that are determined to have a CMP traffic impacts for current or future years cannot be considered in conformity with the Congestion Management Program unless mitigated to no CMP impact. This mandatory mitigation requirement applies only to roadway projects on the CMP network. More latitude is provided for mitigating impacts to the CMP network that result from local land use decisions as described in sections 2 and 3 of this policy.

CMP traffic impacts could be mitigated through modifications of the proposed project. The level of service analysis or simulation can often be used to identify elements of the project that, if modified, will reduce the project impacts.

Mitigation measures may also include roadway improvements, operational changes, or a provision for alternate routes. For example, adding a turn lane at the intersection, modifying or eliminating on street parking may improve travel times. All mitigation measures shall first be discussed with and reviewed by C/CAG staff.

This policy does not prohibit a local jurisdiction from mitigating impacts on local streets that result from congestion on a CMP roadway.

2. General Plan and Specific Plans

Project sponsor, in consultation with C/CAG staff, shall determine if a General Plan change or a Specific Plan will have potential traffic impacts on the Congestion Management Program (CMP) roadway network. Jurisdictions must conduct travel demand forecasting and traffic impact analysis to determine long term cumulative traffic impacts on the CMP roadway system. See "Travel Demand Forecasting" requirements below. For scope and parameters of traffic impact analysis, see Section 4. For definition of traffic impacts on the CMP system, see Section 5. If a jurisdiction makes small and incremental amendments to its General Plan to include land use changes, and that each individual land use change would not have CMP traffic impact, then flexibility is provided that the travel demand forecasting model needs to be run every two years to account for the cumulative list of projects and site specific General Plan changes.

Mitigation:
General Plan updates or Specific Plans that are determined to have CMP traffic impacts must consult C/CAG staff to identify feasible mitigations.

Cumulative development traffic impacts identified in the evaluation of a jurisdiction may be mitigated in a variety of ways. Clearly, revising the allowable land use intensities is the most direct way to mitigate traffic impacts to the CMP network. However, it is recognized that this may not be consistent with the jurisdiction's economic development plans. As alternatives, the jurisdiction may adopt a trip reduction policy that requires new development to make measurable reductions in their trip generation. These trip reduction requirements should be incorporated in the standard Conditions of Approval. The local jurisdiction should also implement a plan to monitor or sample actual trip generation to ensure that the trip reduction conditions are being met following project occupancy. Alternatively, jurisdictions may elect to provide capital improvements to reduce the traffic impact of cumulative development. To be viable, this type of mitigation must include a reliable funding mechanism such as a traffic mitigation fee program that includes, at a minimum, partial funding for the impacted CMP roadways. Where the impact is on the freeway system it will usually not be feasible to fully fund a needed improvement through a local fee. However, the fee program should provide a minimum of funding that would meet likely local share requirements, if approved by the jurisdiction.

All mitigation measures shall first be discussed with and reviewed by C/CAG staff before they are included in the report.

3. Land Use Development Projects

Project sponsor shall comply with the "Land Use Impact Analysis Program" guidelines in the latest Congestion Management Program (CMP) for San Mateo County. Project sponsors shall consult C/CAG staff regarding land use development projects that are determined to have traffic impacts on the CMP roadway network.

Mitigations:

Adopted General Plan trip reduction requirements should ultimately be implemented at the project level through Conditions of Approval. As with the General Plan mitigations, the trip reduction program should include a plan for monitoring trip generation and procedures to determine if established targets are met or exceeded. The option to reduce the intensity of a project to eliminate significant impacts to the CMP network should also be considered. If physical mitigation is desired, the jurisdiction should determine whether the project can and should be required to construct the mitigation project or whether funding the project's pro rata share is appropriate, and paid to the jurisdiction.

Travel Demand Forecasting Requirements

It is the intent of this policy that the cumulative traffic impacts to the CMP roadway system be evaluated consistently throughout the County. Toward this end, the C/CAG Countywide Travel Demand Forecasting Model must be used to forecast traffic demand for the analysis of the long-term cumulative traffic impacts of CMP roadway modification projects, General Plan updates, and Specific Area Plans.

Long Term Cumulative Analysis

The long-term cumulative analysis must be based on C/CAG or C/CAG derivative model forecasts. C/CAG will periodically update the model to provide travel demand forecasts under a 15 to 20 year planning horizon. This does not, necessarily require individual cumulative model runs for each land use development project. For example, a project that is consistent with the City's existing General Plan may not require a new model run. Previous General Plan consistent model results can be used. The alternative methods used for near term analysis or individual development projects as described in the next section may be used to modify the existing model results to illustrate conditions with and without the proposed project. If alternative methods are used to modify cumulative model forecasts, comparison must be made with long-range C/CAG model forecasts to ensure consistency. This type of minor adjustments to the C/CAG model results is permitted for individual land use development projects or minor changes to an existing General Plan. However new C/CAG model runs are required at least every two years[1], for

1 The biennial update of the C/CAG model runs can be postponed until they are needed for the analysis of a

Specific Plans and for major General Plan updates. Updating the C/CAG model runs is necessary to ensure that the cumulative impacts both within each jurisdiction as well as from neighboring jurisdictions are represented in the model results.

A C/CAG derivative model that is consistent with the C/CAG model may also be used; however, it must be reviewed and approved by C/CAG staff in advance. Derivative models must be updated periodically to maintain a 15 to 20 year planning horizon. Approval of a C/CAG derivative model includes the demonstration to C/CAG staff that the model yields similar output as the C/CAG model given the same input assumptions. In addition, the land use assumptions and transportation network assumptions incorporated in a C/CAG derivative model must be consistent with the most recent C/CAG model in order to be eligible for consideration. The C/CAG Countywide Travel Demand Forecasting Model runs must be reviewed by C/CAG. C/CAG may hire its travel demand model consultant to conduct the review, and costs incurred will be borne by the project sponsor.

Near Term Analysis

The use of C/CAG Countywide Travel Forecasting Model or a C/CAG derivative model is not mandatory for near term analysis of projects. The use of methodologies that are widely accepted by the traffic engineering profession such as applying established growth factors to existing traffic volumes, manual assignment models (e.g. TRAFFIX) are also allowable for these analysis scenarios. However, alternative methods for near term impact or individual development project analysis do not replace the requirement for a long-term cumulative impact analysis consistent with this Traffic Impact Analysis Policy.

C/CAG Review for Conformance

For roadway modification projects, C/CAG staff shall review for consistency with this Traffic Impact Analysis (TIA) policy and determine conformity with the Congestion Management Program (CMP).

For General Plan updates, Specific Plans, and land use development projects, C/CAG staff shall review TIA reports for consistency with this TIA policy. This review shall not constitute approval or disapproval of the project that is the subject of the report. C/CAG does not have the authority to approve or reject projects. That decision rests with the lead agency. However, the CMP establishes community standards and guidelines for consistent system-wide transportation review and provides comments to the lead agency on the TIA report based on staff review. Compliance with the Congestion Management Program may be enforced through the withholding of apportionments under Section 2105 of the Streets & Highways Code as well as declaring a local agency ineligible for future transportation funds.

development, planning or CMP roadway project. Therefore, in communities with limited development activity, the two-year-old model runs need only be updated when there is a land use or roadway project to be analyzed.

Section IV
SCOPE AND PARAMETERS FOR TRAFFIC IMPACT ANALYSIS (TIA)

Project sponsors must initiate consultation between the lead agency, C/CAG, Caltrans (if applicable), and those preparing the Traffic Impact Analysis (TIA) before commencing work on the study to establish the appropriate traffic impact analysis scope. At a minimum, the TIA should include the following:

A. Boundaries of the TIA

The boundaries of a TIA must not only include the immediate project area but also areas outside of the project area that may be impacted by the project. For example, the boundaries of an arterial segment, for analysis purposes, may be defined as at least one signalized intersection beyond the project limits on either end. If modification to a segment between intersections will affect the up-stream or down-stream intersection, then average travel time or average travel speed for a segment covering the up- and down-stream intersections must be analyzed.

Boundaries of a TIA must be agreed upon by the lead agency and C/CAG before commencing work on the analysis. Consultation with Caltrans is recommended, if applicable. However, if the project proposes to change a State owned facility, then the boundaries of analysis must be agreed upon by Caltrans as well.

B. Traffic Analysis Scenarios

Consultation between the lead agency, C/CAG, Caltrans (if applicable), and those preparing the TIA is recommended to determine the appropriate scenarios for the analysis. The following scenarios should be addressed as a minimum:

- Existing background condition (includes already approved developments and roadway network changes)
- Existing condition plus Project
- Future (15^2 to 20 year horizon) background without Project (no-build)
- Future (20 year horizon) background condition plus project

C. Analysis Period

Consultation between the lead agency, C/CAG, Caltrans (if applicable), and those preparing the TIA is recommended to determine the appropriate analysis periods. The TIA shall include, at a minimum, an analysis of transportation conditions in the AM and PM peak hours.

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2 20-year Model forecasts are assumed to be updated every 5 years so forecast horizon may be as short as 15 years.

D. Facilities To Be Included In the Analysis

1. A CMP intersection shall be included in a TIA if it is expected to be impacted by the proposed project.
2. A non-CMP intersection that is along a CMP segment shall be included in a TIA if it is expected to be impacted by the proposed project.
3. A freeway segment shall be included in a TIA if it is expected to be impacted by the proposed project.
4. A CMP arterial segment shall be included in a TIA if it is expected to be impacted by the proposed project.

E. Report Format

Traffic Impact Analysis reports must present findings for the various analysis scenarios and analysis periods as described above in the following units of measurement:

Intersections:	LOS and delay time
Freeway segments:	LOS and volume-to-capacity ratio
Arterial segments:	LOS and average travel speed

Section V
DEFINITION OF CMP IMPACT

A project is considered to have a CMP impact if it causes one or more of the following:

1. **CMP Intersection currently in compliance with the adopted LOS standard**:

   A. A project will be considered to have a CMP impact if the project will cause the CMP intersection to operate at a level of service that violates the standard adopted in the current Congestion Management Program (CMP).

   B. A project will be considered to have a CMP impact if the cumulative analysis indicates that the combination of the proposed project and future cumulative traffic demand will result in the CMP intersection to operate at a level of service that violates the standard adopted in the current Congestion Management Program (CMP) and the proposed project increases average control delay at the intersection by four (4) seconds or more.

2. **CMP Intersection currently not in compliance with the adopted LOS standard**:

   A project is considered to have a CMP impact if the project will add any additional traffic to the CMP intersection that is currently not in compliance with its adopted level of service standard as established in the CMP.

3. Freeway segments [3] currently in compliance with the adopted LOS standard:

   A. A project is considered to have a CMP impact if the project will cause the freeway segment to operate at a level of service that violates the standard adopted in the current Congestion Management Program (CMP).

   B. A project will be considered to have a CMP impact if the cumulative analysis indicates that the combination of the proposed project and future cumulative traffic demand will result in the freeway segment to operate at a level of service that violates the standard adopted in the current Congestion Management Program (CMP) and the proposed project increases traffic demand on the freeway segment by an amount equal to one (1) percent or more of the segment capacity, or causes the freeway segment volume-to-capacity (v/c) ratio to increase by one (1) percent.

4 Freeway segments currently not in compliance with the adopted LOS standard:

   A project is considered to have a CMP impact if the project will add traffic demand equal to one (1) percent or more of the segment capacity or causes the freeway segment volume-to-capacity (v/c) ratio to increase by one (1) percent, if the freeway segment is

3 Freeway segments are as defined in the Congestion Management Program Monitoring Program and are directional.

currently not in compliance with the adopted LOS standard.

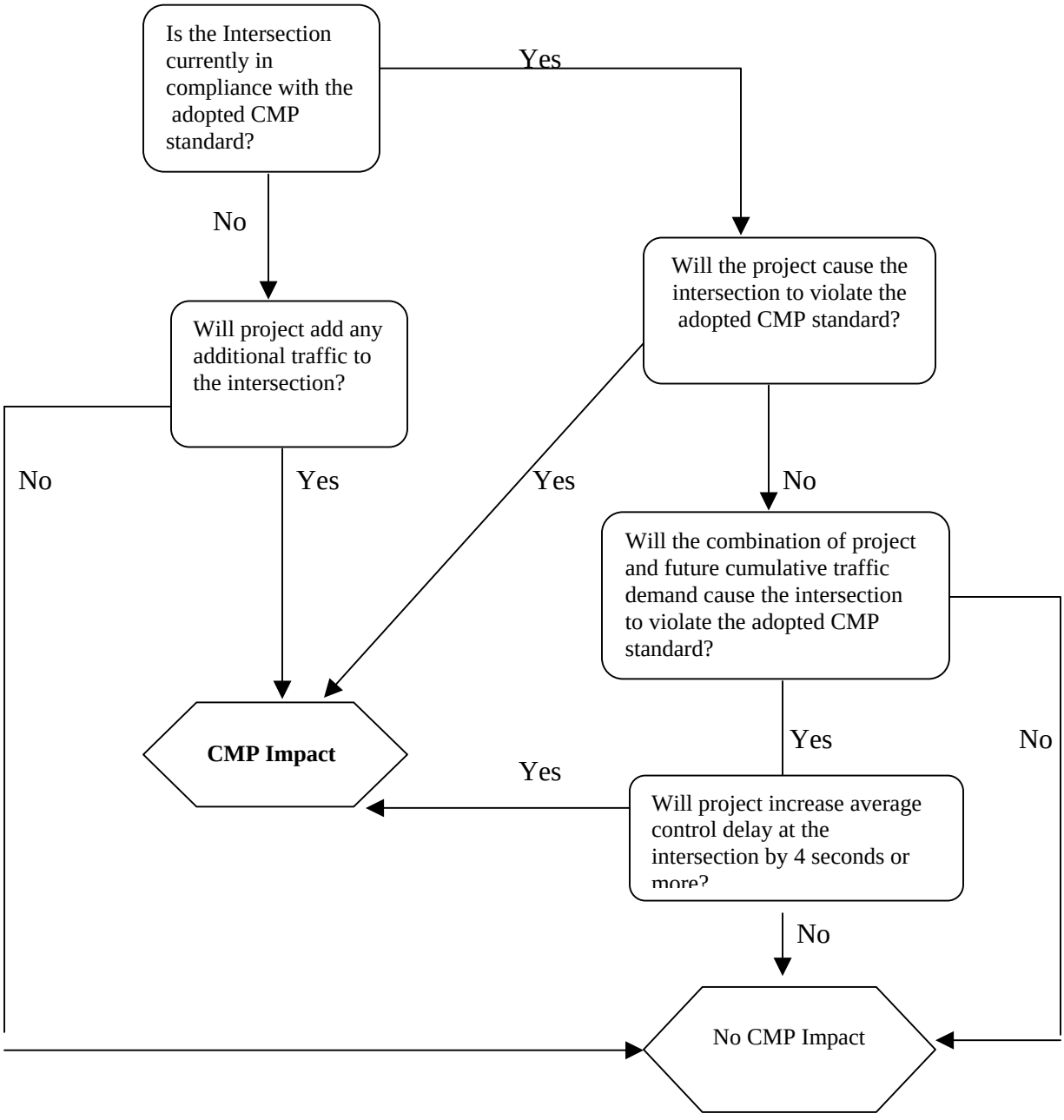
5 CMP Arterial Segments:

The analysis of arterial segments is only required when a jurisdiction proposes to reduce the capacity of a CMP designated arterial through reduction in the number of lanes, adding or modifying on-street parking, or other actions that will affect arterial segment performance.

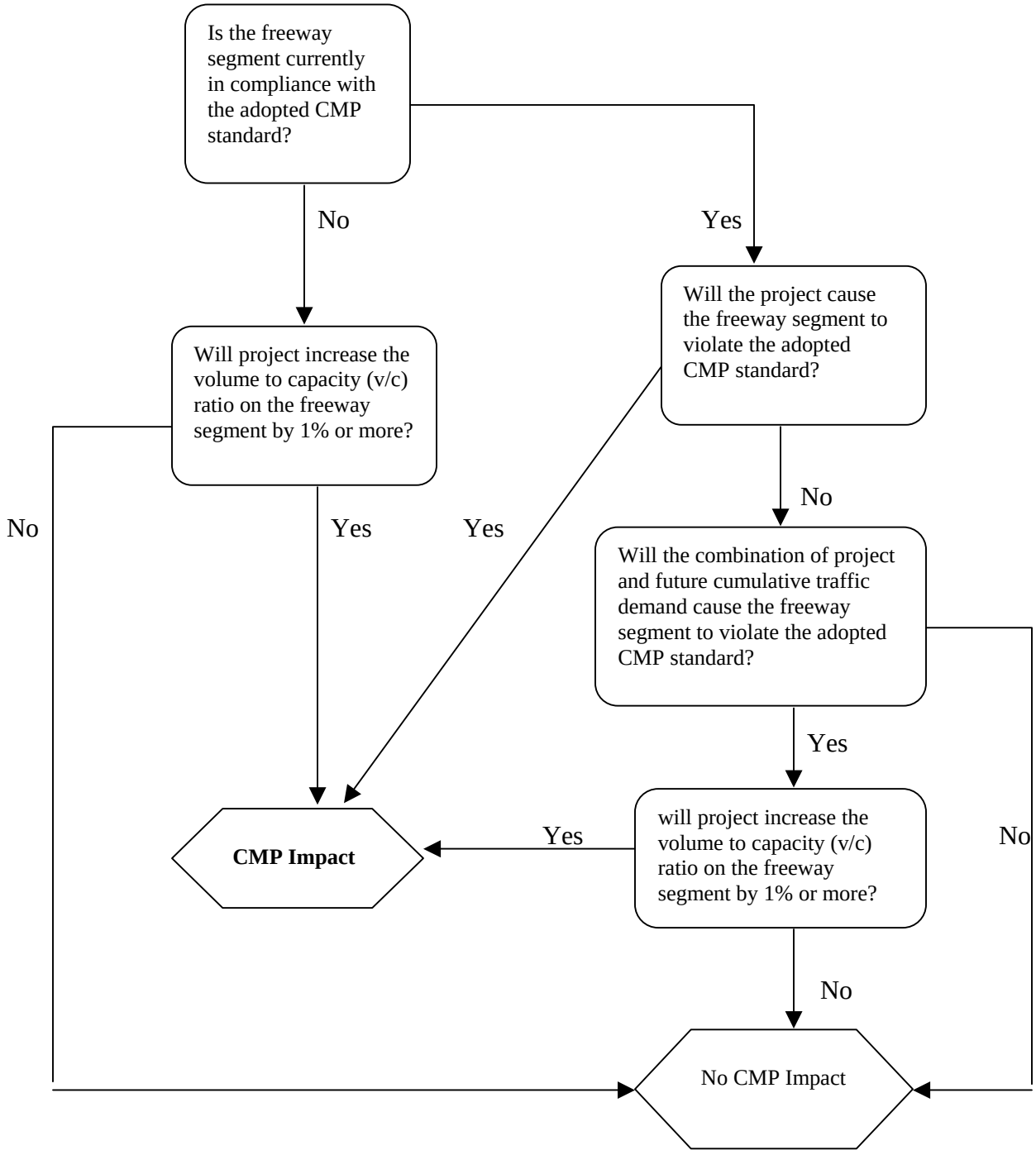
A project is considered to have a CMP impact if it causes mid-block queuing, parking maneuver resulting in delays or other impacts that result in any segment intersection to operate at a level of service that violates the adopted LOS standard set for the nearest CMP intersection.

Analysis of the segment using a calibrated micro-simulation model may be required by C/CAG staff to evaluate non-intersection impacts of the proposed project. CMP impact is determined if, based on the micro-simulation model, the average travel speed for the arterial segment is reduced by 4 miles per hour (mph) or more. Segments with average speeds that indicate LOS E or worse (based on Exhibit 15-2, HCM2000) cannot be modified by local jurisdictions if the proposed modifications would further reduce travel speeds on the segment.

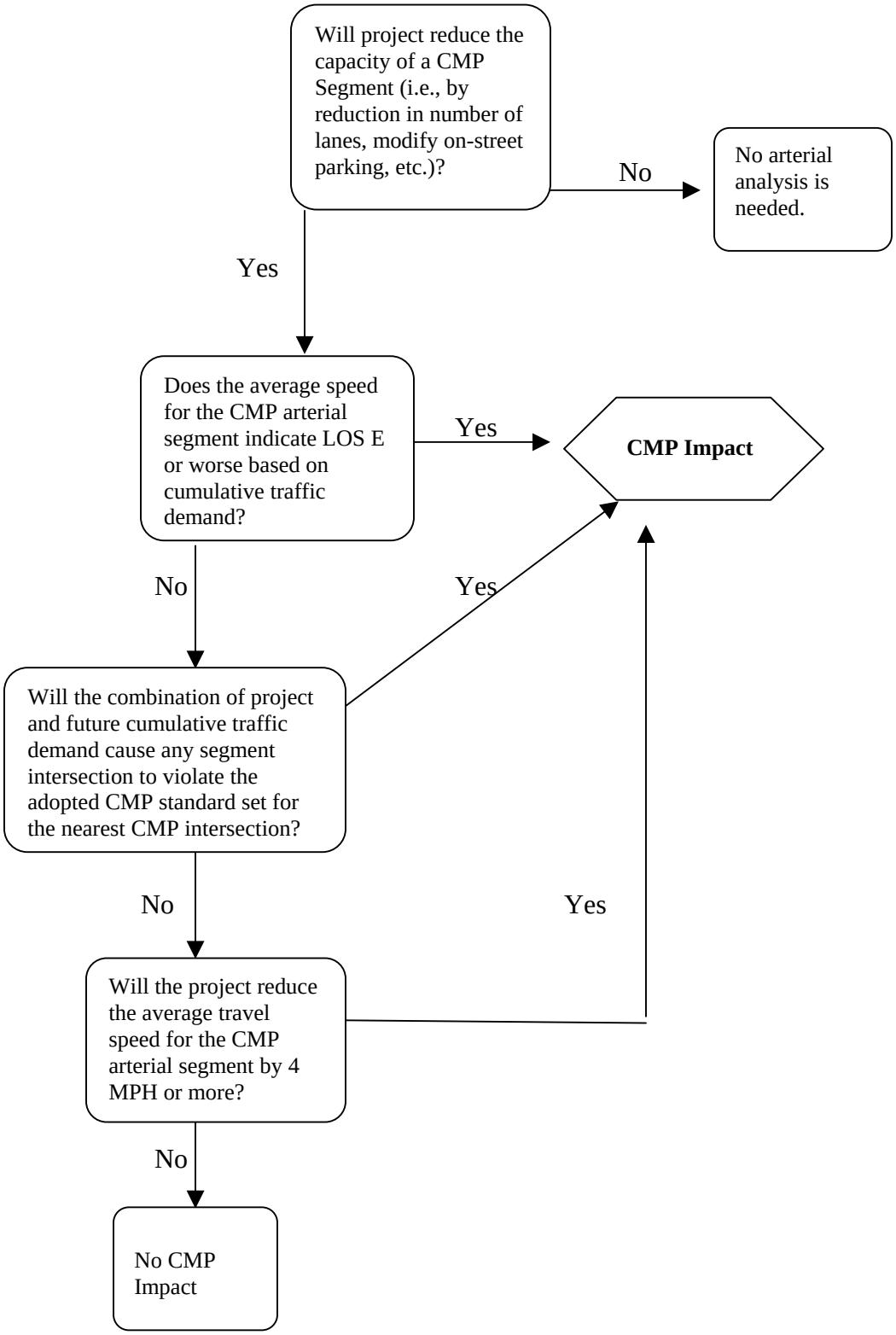
To determine CMP impact on a CMP Intersection



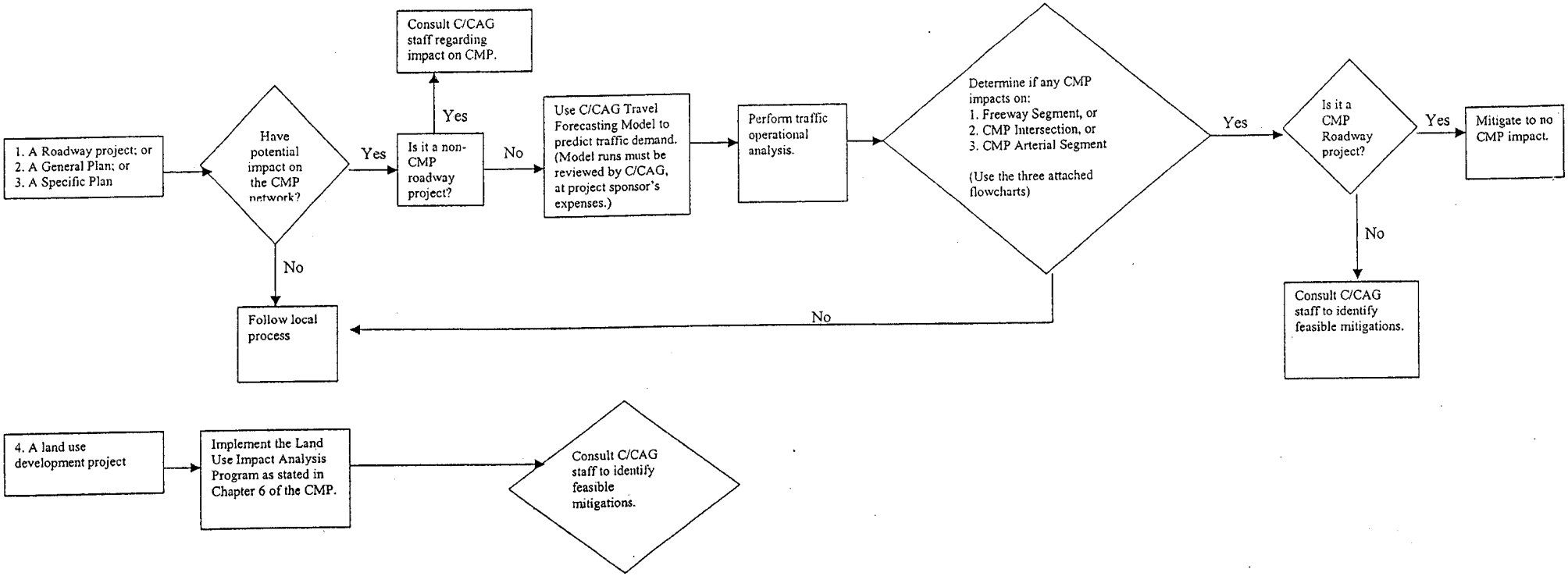
To determine CMP impact on a Freeway Segment



To determine CMP impact on Arterial Segment



Flow chart for traffic impacts on the congestion management program (CMP) roadway network



APPENDIX M

Measure M Implementation Plan

Measure M Implementation Plan

$10 Vehicle Registration Fee

March 2011

PURPOSE OF THE IMPLEMENTATION PLAN

The Measure M Implementation Plan describes the various programs identified in the Expenditure Plan in more detail and established percentages of funds allocated to each of the Countywide Transportation Programs. The Implementation Plan also identifies specific projects and programs under each category that would be eligible to receive funds along with identifying the targeted performance measures for each activity. The Implementation Plan, which requires adoption by the C/CAG Board, is developed at the onset of the 25-Year Measure M Program and will be updated every 5 years.

COLLECTION OF THE FEE

The $10 Vehicle Registration Fee (VRF) will be collected for a period of 25 years, beginning on May 2, 2011 and ending on May 1, 2036. Beginning approximately July 2011 and every month thereafter for the duration of the fee, the Department of Motor Vehicles (DMV) will issue C/CAG a monthly check for revenues collected from the prior month. The estimated revenue is $6.7 million annually and $33.5 million over the initial 5-year implementation period. This amount takes into consideration the DMV's administrative fee charge of approximately $0.005 (one-half of a cent) for each check issued to C/CAG.

IMPLEMENTATION STRATEGY

As indicated in the approved Measure M Expenditure Plan, up to 5% of the proceeds is allocated for administration with 50% of the net revenue allocated to the Local Streets and Roads category and 50% of the net revenue allocated to the Countywide Transportation Programs which includes the following programs: Transit Operations and/or Senior Transportation, Intelligent Transportation System (ITS) and Smart Corridors, Safe Routes to Schools (SR2S), and National Pollutant Discharge Elimination System (NPDES) and Municipal Regional Permit.

The general categories, detailed programs and projects guidelines, and respective performance measures contained in Measure M are further described as follows.

PROGRAM ADMINISTRATION (Up to 5%)

- Allocation of funds to be taken off the top.
- A portion of the funds will be used for routine program administration activities.
- In addition to routine administration, funds will be used to reimburse C/CAG for the following costs.
    - Payment to the County Registrar of Voters for placing Measure M on the November 2, 2010 ballot. (These costs are not counted towards the 5% limit on administration costs and may be amortized over a period of years, as needed)
    - Payment to the DMV for the initial setup and programming for the collection of a ten-dollar ($10) fee imposed on motor vehicles registered in San Mateo County.
- Any unused administration funds would be redistributed to the Local Streets and Roads and/or Countywide Program categories as appropriate.

LOCAL STREETS AND ROADS (50% of Net Revenue)

- Allocations to local jurisdictions (20 cities and the County) for congestion mitigation and stormwater pollution mitigation programs.
- Allocation to be on a cost reimbursement basis utilizing a distribution formula consisting of 50% population and 50% road miles for each jurisdiction modified for a minimum guaranteed amount of $75,000 for each jurisdiction. (Exhibit A)
- Allocations will be made two times a year, at a minimum every 6 months.
- Jurisdictions have the flexibility on use of the funds between the categories and projects; therefore, there are no requirements to split the funds evenly between the categories.
- Measure M should not be used to supplant existing city general funds.

Category	**Programs/Projects Description**	**Performance Measure**
Traffic Congestion Management	▪ Local Shuttles/transportation ▪ Road resurfacing/reconstruction ▪ Deployment of local Intelligent Transportation System (ITS) ▪ Roadway operations (e.g., restriping, signal timing/coordination, signage ▪ Replacement and/or upgrading of traffic signal hardware and/or software	▪ Number of passengers transported ▪ Miles/fraction of miles of roads improved. ▪ Number of ITS components installed/ implemented. ▪ Miles/fraction of miles of roads improved. ▪ Number of units replaced and/or upgraded.
Stormwater Pollution Prevention	▪ Street Sweeping; ▪ Roadway storm inlet cleaning ▪ Street side runoff treatment ▪ Auto repair shop inspections ▪ Managing runoff from street/parking lot ▪ Small capital projects such as vehicle related runoff management/controls ▪ Capital purchases for motor vehicle related runoff management/controls ▪ Additional used oil drop off locations ▪ Motor vehicle fluid recycling programs ▪ Installation of new pervious surface medium strips in roadways	▪ Miles of streets swept ▪ Number of storm inlets cleaned ▪ Square feet of surfaces managed ▪ Number of auto repair shops inspected ▪ Square feet of surfaces managed annually ▪ Number of projects implemented ▪ Number of pieces of equipment purchased and installed ▪ Number of locations implemented/ operated; oil quantity collected ▪ Number of programs implemented/ operated; fluid quantity collected ▪ Square footage of new pervious surface medium strips installed

COUNTYWIDE TRANSPORTATION PROGRAMS (50% of Net Revenue)

- Allocations for the four (4) Countywide Programs are as follows:
  - Transit Operations and/or Senior Transportation - 22%
  - Intelligent Transportation System (ITS) and Smart Corridors - 10%
  - Safe Routes to Schools (SR2S) - 6%
  - National Pollutant Discharge Elimination System (NPDES) and Municipal Regional Permit (MRP) for administration and projects - 12%
- Allocation to be on a cost reimbursement basis.
- Up to a maximum of 4% may be transferred between the ITS/Smart Corridors, SR2S, and NPDES/MRP within the 5-year period taking into consideration actual expenditures, unused allocations, program shortfalls, and program needs.
- The ITS and NPDES projects to be selected by a competitive "call for project" process.
- The Transit Operations and/or Senior Transportation programs to be sponsored by SamTrans or Caltrain. Proposed projects to be submitted to C/CAG annually for approval.
- The SR2S Program to be administered by the C/CAG through the County Office of Education (COE)
- The ITS/Smart Corridors and NPDES/MRP Programs to be administered by C/CAG

Category	**Programs/Projects Description**	**Performance Measure**
Transit Operations and/or Senior Transportation	▪ SamTrans Paratransit operations and maintenance (Caltrain projects are also eligible) ▪ Senior Mobility Management projects that complement paratransit (e.g., Mobility Ambassadors, Van Sharing) ▪ Senior Mobility Education (e.g. Senior Mobility Guide, Website Management)	▪ Operating costs and fare revenue; Usage; Operating Efficiency; Reliability and Safety; Customer satisfaction; Cost effectiveness ▪ To be determined ▪ To be determined
ITS and Smart Corridors	▪ Deployment of projects having regional and countywide significance ▪ Maintenance and operations of the Smart Corridors specific equipment located within the San Mateo County jurisdictions' right-of-way	▪ Number of ITS components installed and implemented ▪ Number of instances and duration that the equipment (directional signs, CCTV, communications, power supply line and equipment) is inoperable; Operability and activation of equipment
SR2S	▪ San Mateo County SR2S Program provides modularized activities enable children to walk and bicycle to school through education, outreach, encouragement, evaluation and enforcement activities	▪ Number of schools participating in the Program; Number of programs, projects, and activities implemented

COUNTYWIDE TRANSPORTATION PROGRAMS (Continue)		
Category	**Programs/Projects Description**	**Performance Measure**
NPDES and MRP	▪ Street and Road Repair and Maintenance	▪ Number of guidance documents developed; area/length of roadways managed
	▪ Green Street projects	▪ Number of projects completed, area of impervious surface managed with low impact development measures
	▪ Control mobile sources	▪ Number of guidance documents developed, outreach events or materials distributed, or mobile source properly managed
	▪ Public outreach events	▪ Number of materials/events developed, distributed, and/or attended; Number of people contacted
	▪ Trash load reduction and hot spot cleanup	▪ Number of guidance documents developed; quantity of area addressed by trash management measures; amount of trash loading reduced/prevented through implementation of management measures
	▪ Vehicle brake pad pollution impacts	▪ Number of guidance documents developed and/or quantity of pollutants addressed by management measures

EXHIBIT A

The table below provides an estimated distribution for the Local Streets and Roads allocation based a formula consisting of 50% population and 50% road miles for each jurisdiction modified for a minimum guaranteed amount of $75,000 for each jurisdiction.

Jurisdiction	% of Total Allocation	Estimated Net Annual Revenue	Estimated Net 5-Year Revenue
San Mateo County	12.15%	$ 386,806	$ 1,934,032
San Mateo	11.02%	$ 350,562	$ 1,752,810
Daly City	9.62%	$ 305,999	$ 1,529,995
Redwood City	8.82%	$ 280,747	$ 1,403,733
South San Francsico	7.17%	$ 228,162	$ 1,140,812
Pacifica	4.84%	$ 153,891	$ 769,454
San Bruno	4.76%	$ 151,514	$ 757,570
Menlo Park	4.50%	$ 143,095	$ 715,475
San Carlos	4.03%	$ 128,341	$ 641,707
Burlingame	3.95%	$ 125,668	$ 628,338
Belmont	3.29%	$ 104,574	$ 522,872
Foster City	3.12%	$ 99,227	$ 496,134
East Palo Alto	3.06%	$ 97,444	$ 487,222
Hillsborough	2.81%	$ 89,423	$ 447,115
Millbrae	2.74%	$ 87,046	$ 435,232
Atherton	2.36%	$ 75,000	$ 375,000
Woodside	2.36%	$ 75,000	$ 375,000
Half Moon Bay	2.36%	$ 75,000	$ 375,000
Portola Valley	2.36%	$ 75,000	$ 375,000
Brisbane	2.36%	$ 75,000	$ 375,000
Colma	2.36%	$ 75,000	$ 375,000
Total	**100%**	**$ 3,182,500**	**$ 15,912,499**

Notes:

1. Population totals are updated based on the State of California Department of Finance estimates
2. Figures may be slightly off due to rounding off errors.
3. Assumes constant annual revenue over the 5-year Implementation Plan period.
4. Final net distribution amounts will take into account deductions for one-time election costs (which could be amortized over a period of years) and DMV initial set up and programming costs.