MARIN CONGESTION MANAGEMENT PROGRAM

2009 Update

ADOPTED BY

TAM
Transportation Authority of Marin

PREPARED BY

DKS Associates
TRANSPORTATION SOLUTIONS

Transportation Authority of Marin

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1.0 DESIGNATED ROADWAY SYSTEM

1.1 Purpose and Intent of Legislation

The designated roadway system includes all state highways and principal arterial roadways in Marin County. Once a highway or roadway has been designated as part of the system, it cannot be removed.[1] Furthermore, the regional transportation system is to be part of the required land-use program.[2]

The Congestion Management Program (CMP) roadway system is a network that allows monitoring of performance with respect to established level-of-service (LOS) standards. The network must be created at a level whereby impacts can be identified, and a connection can be made between proposed projects and their specific impacts on the network. The network cannot be too small, as impacts would not be identifiable, and at the same time, the network cannot be too large, as logistical problems would arise in monitoring performance.

1.2 Relationship to Regional Plans

The Congestion Management Program is a short-range document containing elements which further the goals of the Regional Transportation Plan (RTP) maintained by the Metropolitan Transportation Commission (MTC). MTC has determined that the Marin CMP roadway system is consistent with the RTP, last adopted in April, 2009. This RTP includes goals of safety, reliability, access, livable communities, clean air and efficient freight travel.

The designated roadway system is included within the RTP's Metropolitan Transportation System. This facilitates regional consistency between the Marin CMP and CMPs of adjoining Contra Costa, San Francisco, and Sonoma counties.

1.3 Designated CMP System

State highways and other principal arterial roadways in this CMP were defined in prior CMPs. MTC has provided a framework that allows for flexibility in defining the principal arterial system. The following criteria were used to establish the designated CMP roadway network:

State Highways. All State highways must be included in the CMP roadway network according to the CMP legislation. If a route is to be removed from the State Highway System, it is to be evaluated according to the principal arterial criteria to determine whether it should remain in the CMP network.

1 California Government Code Section 65089(b)(1)(A)

2 California Government Code Section 60589(b)(4)

Principal Arterial Roadways. The original CMP, created in 1991, designated principal arterial roadways in addition to State facilities as the CMP roadway network. Non-State CMP roadways were included based upon criteria listed below:

- Purpose and function of the roadway
- Land use adjacent to the roadway and proximity to activity centers
- Average Daily Traffic (ADT) volume, generally over 25,000 vehicles a day
- Connectivity to other facilities

1.4 The CMP Designated Network

The following routes, shown on Figure 1 on page 3, are designated as the State Highway portion of the Marin CMP roadway network:

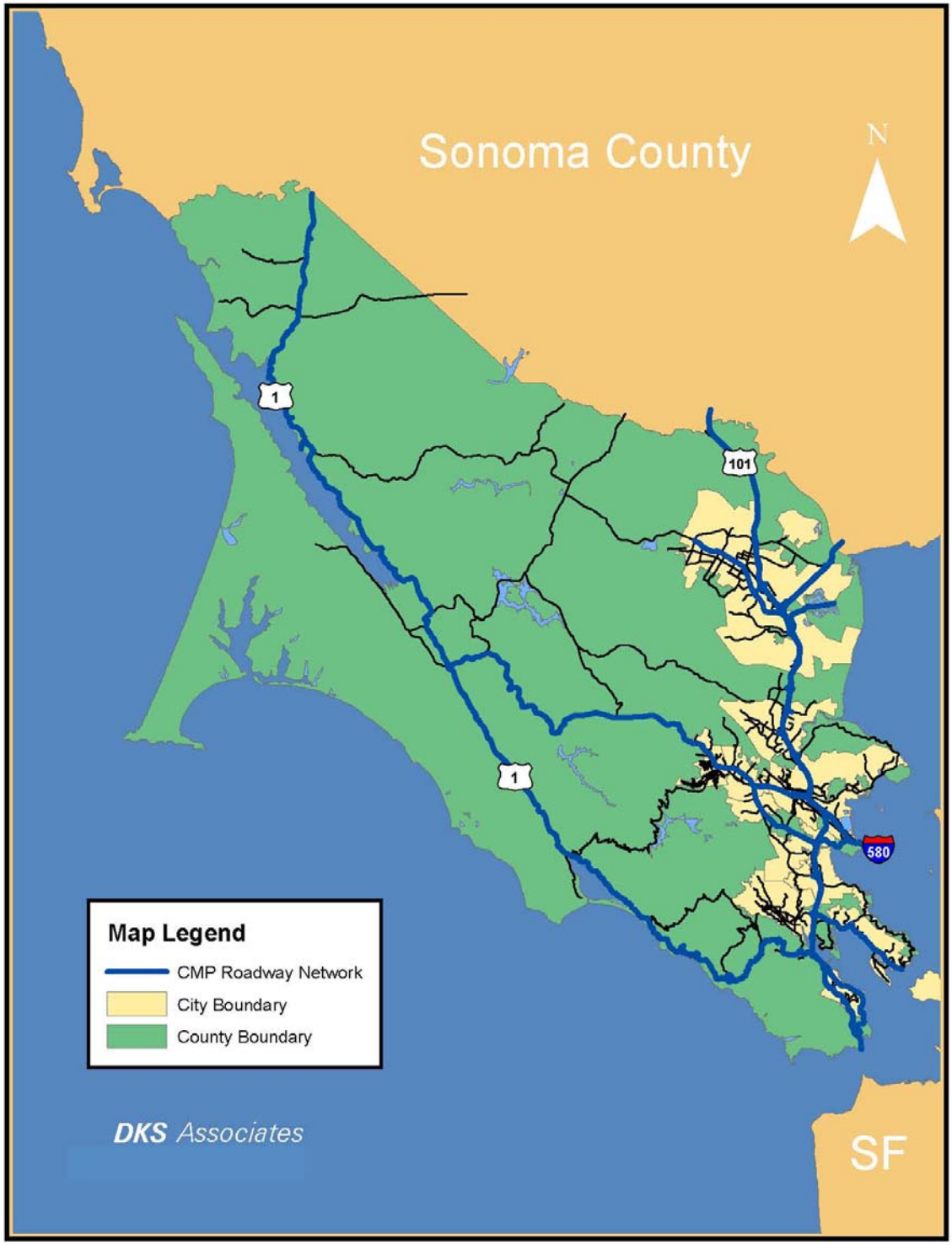
- **Interstate 580** – from U.S. 101 to Contra Costa County line
- **U.S. 101** – from San Francisco County Line to Sonoma County Line
- **State Route 1** – from U.S. 101 to Sonoma County line
- **State Route 37** – from U.S. 101 to Sonoma County line
- **State Route 131** – from U.S. 101 to Main Street in Tiburon

The following routes (also shown on Figure 1) are designated as the principal arterial portion of the Marin CMP roadway network:

- **Bel Marin Keys Boulevard** – from U.S.101 southbound ramps to Arroyo San Jose
- **Bridgeway/Richardson Street/Second Street/Alexander Avenue in Sausalito** – from U.S. 101 to U.S. 101
- **Fourth Street** in San Rafael – from Ross Valley Drive to Marquard Avenue
- **Novato Boulevard** in Novato –from Sutro Avenue/San Marin Drive to Diablo Avenue
- **Red Hill Avenue** in San Anselmo – from Sir Francis Drake Boulevard to Ross Valley Drive
- **Rowland Boulevard** in Novato – from South Novato Boulevard to U.S. 101
- **Second Street** in San Rafael – from Marquard Avenue to U.S. 101
- **Sir Francis Drake Boulevard** in Larkspur and unincorporated Marin County – from U.S. 101 to Interstate 580
- **Sir Francis Drake Boulevard** in Larkspur, Kentfield, Ross, San Anselmo, and Fairfax – from State Route 1 to U.S. 101
- **South Novato Boulevard** in Novato – from Novato Boulevard to U.S. 101
- **Third Street** in San Rafael – from US 1-1 to Marquard Avenue

In total, the 123-mile CMP designated roadway network contains 91 miles of state highways and 32 miles of principal arterial roadways.

FIGURE 1. MARIN CMP ROADWAY NETWORK



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2.0 DESIGNATED ROADWAY SYSTEM AND LEVEL-OF-SERVICE

2.1 Purpose and Intent of Legislation

Level-of-service (LOS) standards are to be established as part of the CMP[3], and are to be specified by the Transportation Research Board, the Highway Capacity Manual, 2000 or an accepted alternative.

2.1.1 Measuring Level of Service

Traffic LOS definitions describe conditions in terms of speed and travel time, volume, capacity, ease of maneuverability, traffic interruptions, comfort, convenience, and safety. Table 1 defines the roadway segment LOS criteria used in monitoring the Marin County CMP roadway network. There are six gradations of LOS; from A to F. LOS A reflects free flow conditions, with vehicles traveling at the maximum posted speed. LOS F reflects congested conditions, with vehicles traveling 'bumper-to-bumper'.

TABLE 1. ROADWAY SEGMENT LEVEL OF SERVICE (LOS) CRITIERIA

Level of Service	Basic Freeway Segment Travel Speed (mph)	Major Arterial Segment Travel Speed (mph)	Basic* Freeway (v/c)	Major* Arterial (v/c)
A	>60	>25	0.35	0.60
B	57-60	20-25	0.54	0.70
C	54-56	13-19	0.77	0.80
D	47-53	10-13	0.93	0.90
E	30-46	7-9	1.00	1.00
F	<30	<7	>1.00	>1.00

Source: 1985 Highway Capacity Manual Special Report 209, 2000 Highway Capacity Manual

*LOS criteria used in Transportation System Performance Monitoring Report – 2008. Traffic volumes were collected at one point along the roadway segment then divided by a predetermined roadway capacity to arrive at a v/c ratio.

The LOS designation provides a quantitative tool that can be used to analyze the impacts of land use changes on the CMP network. Traffic LOS also is used as a measure of system performance (e.g., congestion). Every two years the CMA is required to determine whether local governments have been conforming to the CMP, including attainment of LOS standards. This is achieved through a self-certification process whereby monitoring and reporting of LOS conditions is conducted by the CMA or by local jurisdictions. The CMA should then, upon receiving local monitoring reports, determine whether the local government is in conformance with the CMP. Additional detail on monitoring requirements is included in Chapter 8.

3 California Government Code 65089(b)(1)(A)

Local governments must consider the impacts that land-use decisions have on LOS on the designated CMP network. Therefore, a systems approach may have to be examined when considering LOS on the entire system. Cities and counties may be responsible for improvements and funding of programs that affect the system as a whole.

2.2 Highway Level of Service Standards

2.2.1 Goals and Objectives

The LOS technique should allow for measurement of traffic growth trends through changes in volumes, capacity, and delay. The enabling CMP guidance identifies several issues that affect the determination of LOS and the application of a standard. The Marin County CMP has developed an approach that is consistent, easy to use, non-duplicative, and compatible with local government data and travel demand models. Table 2 summarizes the approach used to address each issue identified in the guidance.

The CMP legislation allows trips not originating in a county, trips passing through a county, or trips generated by low- and very low-income housing to be excluded from the determination of conformance with LOS standards following consultation with MTC, Caltrans, and the Bay Area Air Quality Management District. TAM decided to include these trips, however, when determining conformance with LOS standards for local planning purposes, as exclusion of these trips would present a misleading picture of the traffic conditions in the county and could artificially skew the inclusion and/or ranking of projects in the 7-year Capital Improvement Program.

In September 2002, the California legislature passed SB 1636, intending to "remove regulatory barriers around the development of infill housing, transit-oriented development, and mixed use commercial development" by enabling local jurisdictions to designate "infill opportunity zones." These zones are defined as areas designated for compact, transit-oriented housing and mixed use within 1/3 mile of major transit stops. The CMP network segments within the IOZ are required to be exempt from CMP traffic LOS standards. In their place, a city must include these streets under an alternative area wide LOS standard or multimodal composite or personal LOS standard, or approve a list of flexible mitigation options that includes investments in alternative modes of transportation. No infill opportunity zones have been identified for the Marin CMP at this time.

TABLE 2. APPROACHES TO MARIN CMP ISSUES

Issue	Approach
Inter-County Trips	In accordance with California statutory requirements, trips with no end in Marin County (through trips) are not to be included for deficiency plan determination. These trips are included for performance reporting.
LOS Standards	D for Urban and Suburban Arterial Roadways, E for Freeways and Rural Expressways (U.S. 101, Interstate 580, and State Route 37)
Method Analysis **Freeway and Rural Expressway Segments**	The analysis technique for freeway segments, based on segment weekday P.M. peak-hour volume to capacity ratios is from Chapter 23 and 24 of the *Highway Capacity Manual.* (The P.M. peak hour is the highest consecutive 60 minutes of traffic in the afternoon, typically between 5 P.M. and 6 P.M.)
Method Analysis **Urban and Suburban Arterial Segments**	Volume-to-capacity ratios are the analysis technique for arterial sequences, utilizing capacities provided in Chapter 15 and 16 of the *Highway Capacity Manual,* and based on weekday P.M. peak-hour traffic volumes. (The P.M. peak hour is the highest consecutive 60 minutes of traffic in the afternoon, typically between 5 P.M. and 6 P.M.)
Method Analysis **Rural Roadways**	Chapter 20 of the *Highway Capacity Manual* is the analysis technique to be applied for rural roadways, based on weekday P.M. peak-hour traffic volumes. (The P.M. peak hour is the highest consecutive 60 minutes of traffic in the afternoon, typically between 5 P.M. and 6 P.M.)
Monitoring	The local agency (e.g., city and county) or TAM performs the LOS monitoring. Count frequency is to be biennial (with certain exceptions outlined in Chapter 8), recognizing that more frequent counting could be done as part of development impact study requirements.
Deficiency Analysis	More refined analyses may be required when determining if a roadway segment is deficient. If appropriate, the operational analysis methodology described in the *Highway Capacity Manual* may be used to determine LOS.

2.2.2 Facility Classifications

The *Highway Capacity Manual* provides methods for determining LOS on several types of facilities. These facilities are grouped into interrupted- and uninterrupted-flow facilities. Interrupted- flow facilities include city streets and surface highways (like Highway 1) that are part of the State Highway System. For purposes of LOS analysis, the CMP network is classified into two functional types of facilities:

Basic Freeway Segments. These are uninterrupted- flow facilities with multiple lanes available in each direction since traffic only stops during the most congested periods or when breakdowns occur.

Urban and Suburban Arterial Roadways. These are multi- lane streets that have traffic signals less than two miles apart on average. Volume-to-capacity ratios are used to estimate level of service. The advantage of this approach is that volume-to-capacity ratios are easily determined.

2.2.3 Definition of Roadway Segments

The segments of the CMP network that are analyzed are listed in Chapter 1. For the arterial roadways, a "responsible jurisdiction" has been designated. The jurisdiction named is the one with the greatest segment mileage. This jurisdiction is responsible for preparing any deficiency plans that may be required, as well as complying with all other requirements of the CMP legislation related to that segment. Other jurisdictions through which the segment travels are expected to work in a cooperative fashion with the responsible jurisdiction, and bear a *prorata* share of the cost of any improvement to the facility based on the approximate cost of improvements in their jurisdiction. In the event that funding is needed for a program, each jurisdiction would contribute its fair share of the cost based on segment mileage within the jurisdiction.

2.2.4 Identification of "Grandfathered" Roadway Segments

Roadway segments that operated at a lower LOS than the standard which was established in 1991 are "grandfathered" and allowed to continue to operate at a lower LOS standard level until such time as they are improved or the traffic load is diverted. Freeway segments that operated LOS F or arterial segments that operate at LOS E or F in the 1991 CMP qualify as "grandfathered" segments. The status of each segment in Marin County is listed in Table 3. The grandfathered segments are illustrated in Figure 2.

TAM and its CMA predecessor have agreed to grandfather the LOS E or F facilities. In the future, TAM may wish to develop an improvement plan to address congestion as appropriate. An improvement plan would consist of a description of the actions required to improve the LOS on the facility, either by increasing capacity or managing the demand for travel in a manner that effectively improves LOS.

2.2.5 2008 Monitoring Results

The monitoring for the 2009 CMP has been conducted by PHA Consultants for TAM. The results of monitoring, documented in the *Transportation System Performance Monitoring Report – 2008 (available at the TAM website)*, indicate four categories of results, as discussed below. Results are summarized in Table 4 and Table 5. Table 4 contains speed survey results for the P.M. peak period. Table 5 contains a historic trend for LOS of monitored segments.

It is important to note that prior to the 2007 CMP, the methodology for monitoring LOS was conducted by using the volume to capacity (V/C ratio), as described in Table 1. Since 2006, the methodology shifted from the use of traffic volumes to measuring the amount of time traveled through a segment,, reflecting newer LOS calculation method now recommended and performed by the *Highway Capacity Manual* printed in 2003. Table 5 indicates the years that the new method of calculating LOS by travel time runs are applied.

Table 6 illustrates actions that should be taken on each segment, based on monitoring results.

The first category includes non-grandfathered roadway segments with satisfactory status for now and for which no action is needed. There are 13 of these segments.

The second category includes roadway segments that operate at acceptable levels of service but were originally included in the grandfathered segments in the CMP. These roadway segments should continue to be monitored and made subject to the requirements of the CMP. Improvement plans may not be necessary at this time but may be required in the future. Ten roadway segments fall under this category.

The third category includes five locations that are grandfathered roadway segments in the CMP and have been found to currently operate worse than the LOS standard would be if the facilities were not grandfathered. The segments that are grandfathered and operate worse than the LOS standard are not required to have a plan to remove the LOS deficiency, but should have an identified strategy to manage the situation. Two of these in Central Marin have recently been remedied (as discussed later in this chapter) and one has a defined project that is partially funded (US 101 widening at Marin Sonoma Narrows).

A final category includes those roadways that currently operate worse than the LOS standards but were not grandfathered in the CMP. Any roadway segments in this category should be highlighted for future evaluation, and then the CMA should decide whether deficiency plans or improvement plans are required. No segments fall into this category.

No County jurisdiction is considered out of conformance at this time.

Several segments demonstrated an improved level of service from prior years, as indicated on Table 5. This is attributed either to lighter than normal traffic on the days these facilities were monitored, or to the 2007 change in methodology used to measure level of service.

2.2.6 Results from Additional 2009 Monitoring

A major project to provide HOV lanes through Central San Rafael, and accompanying auxiliary lane improvements to the corridor, was substantively completed in Spring 2009. The opening of the additional lanes occurred after the 2008 monitoring was performed. Several segments demonstrated an improved level of service from the monitoring. The benefit has been documented, and displayed in Table 7. During the CMP study period, the benefit eliminated the LOS F occurring on Segments 8 and 17, as well as the LOS E on Segments 11 and 13.

FIGURE 2. MARIN CMP 'GRANDFATHERED' ROADWAY NETWORK

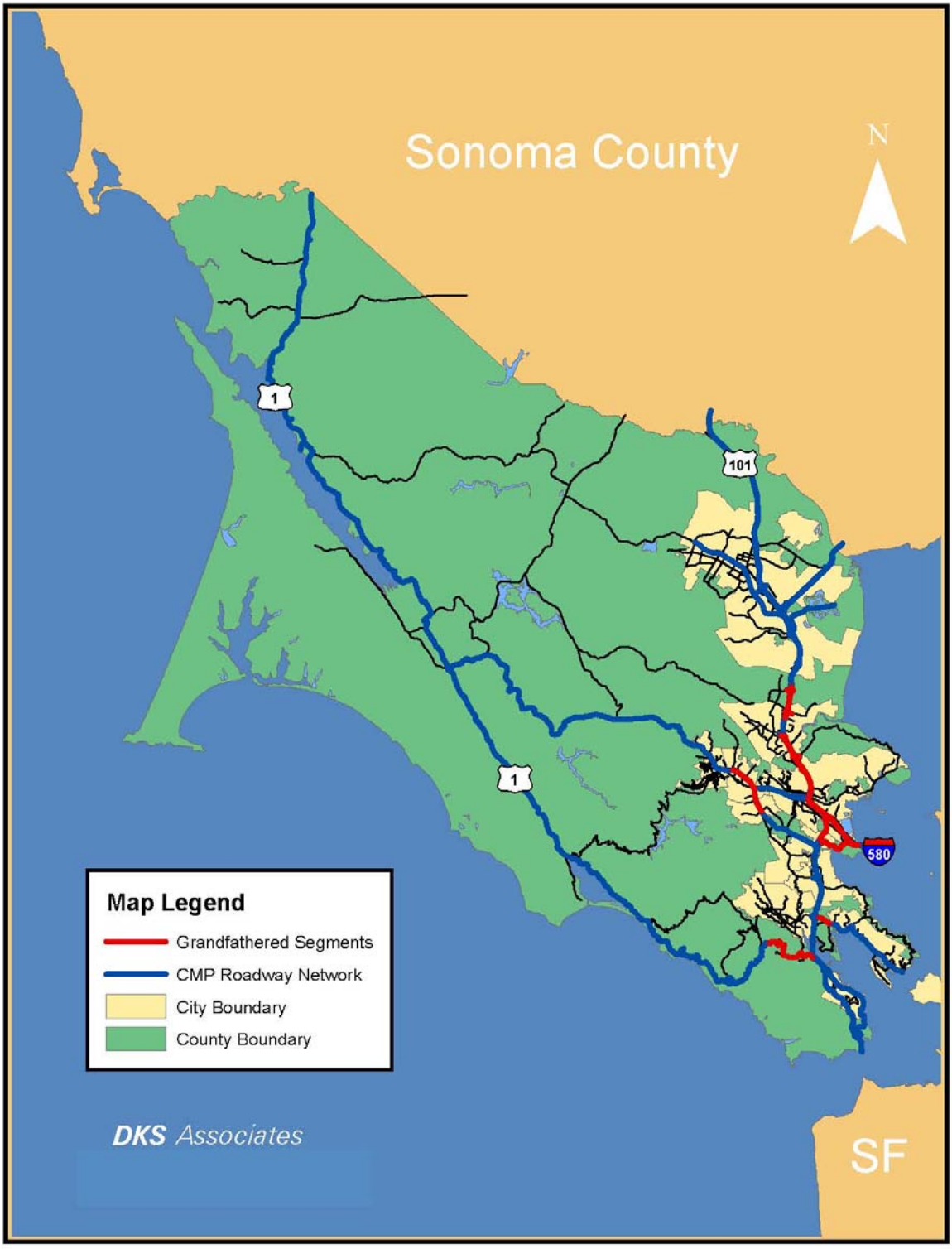

TABLE 3. ROADWAY SEGMENTATION DESCRIPTION

Segment Number	Facility Type	Location Name	From	To	Grandfathered?
1	Principal Arterial	Shoreline Highway (SR 1)	Flamingo Road	Sonoma	No
2	Basic Freeway	US 101	Atherton Avenue	Sonoma County Line	Yes
3	Principal Arterial	Novato Boulevard	San Marin Drive	Wilson Avenue	No
4	Principal Arterial	South Novato Boulevard	US 101	Novato Boulevard	No
5	Basic Freeway	SR 37	US 101	Atherton Avenue	No
6	Principal Arterial	Bel Marin Keys	US 101	Commercial Boulevard	Yes
7	Basic Freeway	US 101	N. San Pedro Road	SR 37	Yes
8	Basic Freeway	US 101	Mission Avenue	N. San Pedro Road	Yes
9	Principal Arterial	Sir Francis Drake Boulevard	San Anselmo Avenue	Red Hill Avenue	Yes
10	Principal Arterial	Red Hill Avenue	Sir Francis Drake Boulevard	Hilldale Drive	No
11	Basic Freeway	US 101	I-580	Mission Avenue	Yes
12	Principal Arterial	Sir Francis Drake Boulevard	College Avenue	Wolfe Grade	Yes
13	Basic Freeway	US 101	Sir Francis Drake Blvd.	I-580	Yes
14	Basic Freeway	I-580	Sir Francis Drake Boulevard	Bellam Boulevard	Yes
15	Basic Freeway	I-580	Sir Francis Drake Boulevard	Richmond/San Rafael Bridge	No
16	Principal Arterial	E. Sir Francis Drake Boulevard	US 101	Larkspur Landing Center	Yes
17	Basic Freeway	US 101	Shoreline (SR 1)	Tiburon Highway Boulevard (SR 131)	Yes
18	Principal Arterial	Tiburon Boulevard (SR 131)	US 101	Strawberry Drive	No
19	Principal Arterial	Shoreline Highway (SR 1)	Northern Avenue	Almonte Boulevard	Yes
20	Principal Arterial	Bridgeway Boulevard	US 101	US 101	No
21	Basic Freeway	US 101	San Francisco County Line	Shoreline Highway (SR 1)	No
22	Principal Arterial	Sir Francis Drake Boulevard	Butterfield Road	Shoreline Highway (SR 1)	Yes
23	Principal Arterial	Sir Francis Drake Boulevard	College Avenue	Toussin Avenue	Yes
24	Principal Arterial	Novato Boulevard	Wilson Boulevard	Diablo Avenue	No
25	Principal Arterial	State Route 1	US 101	Tennessee Valley	N.A.
26	Principal Arterial	2nd Street	Marquard Street	US 101	N.A.
27	Principal Arterial	3rd Street	US 101	Marquard Street	N.A.

Source: Transportation System Performance Monitoring Report – 2008, PHA Transportation Consultants

TABLE 4. STUDY ROADWAY SEGMENT MONITORING RESULTS 2009 (PM LOS)

	Study Segments	Mileage	Direction	Time (minutes)	Speed (mph)	LOS
1	State Route 1 (SFD - Pt: Reyes)	2.1	NB	3.7	34.4	A
			SB	3.3	37.8	A
2	US 101 (Atherton - Sonoma County Line)	5.4	NB	11.0	29.5	**F**
			SB	5.3	60.8	A
3	Novato Bl. (San Marin – Eucalyptus)	0.4	NB	1.3	18.0	C
			SB	1.0	24.0	B
4	S. Novato Bl. (Sunset Pkwy - Hwy 101)	1.2	NB	2.7	27.0	A
			SB	2.7	27.0	A
5	SR 37 (Hwy 101 – Atherton)	2.6	EB	2.7	58.5	B
			WB	2.7	58.5	B
6	Bel Marin Keys (US 101 – Commercial)	0.2	EB	0.7	18.0	C
			WB	0.7	18.0	C
7	Hwy 101 (Freitas Pkwy - Lucas Valley)	1.0	NB	1.0	60.0	A
			NB(HOV)	1.0	60.0	A
			SB	1.0	60.0	A
8	US101 (Mission - N. San Pedro)	1.6	NB	2.3	41.1	E
			SB	4.0	24.0	**F**[1]
9	SFD Bl. (San Anselmo - Red Hill)	1.1	EB	2.7	24.8	B
			WB	3.3	19.8	C
10	Red Hill (SFD – Hillsdale)	0.4	EB	1.3	18.0	C
			WB	2.3	10.4	D
11	US 101 (I-580 – Mission Ave)	1.1	NB	2.0	33.0	E[1]
			SB	1.0	66.0	A
12	SFD Bl. (College - Wolfe Grade)	0.6	EB	1.0	36.0	A
			WB	1.0	36.0	A
13	US 101 (SFD - I-580)	1.3	NB	2.3	33.4	E[1]
			SB	1.3	58.5	B
14	I-580 (Bellam – SFD)	1.2	EB	1.3	54.0	C
			WB	2.0	36.0	E
15	I-580 (SFD - R-S Bridge)	0.7	EB	1.0	42.0	E
			WB	1.0	42.0	E
16	E. SFD Bl (Hwy 101 - E. Larkspur Landing)	0.5	EB	4.0	7.5	**E**
			WB	3.3	9.0	**E**
17	US 101 (SR 131 – Paradise) (HOV Lane)	1.7	NB	7.3	13.9	**F**[1]
			NB(HOV)	1.3	76.5	A
			SB	1.7	61.2	A
			SB(HOV)	1.3	76.5	A
18	SR 131 (Redwood Frontage Rd. – Strawberry)	0.5	EB	1.0	30.0	A
			WB	1.0	30.0	A
19	SR 1 (Northern – Almonte)	0.8	EB	2.3	18.0	B
			WB	2.3	18.0	B
20	Bridgeway Bl. (Gate 5 - Gate 6)	0.2	EB	0.7	18.0	C
			WB	0.7	18.0	C
21	US 101 (North of GG – Spencer)	1.4	EB	1.3	63.0	A
			WB	1.3	63.0	A
22	SFD Bl. (Butterfield – Willow)	0.2	EB	1.0	12.0	D
			WB	3.0	4.0	**F**
23	SFD Bl. (College – Toussin)	0.3	EB	1.0	18.0	C
			WB	1.7	10.8	D
24	Novato Bl. (Grant –Diablo)	0.7	EB	1.7	25.2	A
			WB	2.0	21.0	B
25	SR 1 (US 101-Tenn. Valley)	0.4	EB	1.0	24.0	B
			WB	1.0	24.0	B
26	2nd St. (Marquard St.- US 101)	0.8	EB	3.7	13.1	C
27	3rd St. (US 101-Marquard St.)	0.8	WB	4.0	12.0	D

[1] Indicates improved LOS later identified, resulting from US 101 HOV lane project completion in San Rafael.
Source: PHA Transportation Consultants, February 2009.

TABLE 5. HISTORIC TREND OF ROADWAY SEGMENT - PM LOS

#	Segment	1999	2001	2003	2005	*2007 (new method)*	*2009 (new method)*	Grand-fathered
1	Shoreline Highway (State Route 1) from Sir Francis Drake Blvd to Pt. Reyes	A	A	A	A	*A*	A	No
2	U.S. 101 from Atherton Ave. to Sonoma County Line	F	E	F	D	*E*	**F**	Yes
3	Novato Blvd. from San Marin Dr/Sutro Ave to Wilson Ave*	A	A	A	A	*B*	C	No
4	South Novato Blvd from U.S. 101 to Novato Blvd.) *	A	A	A	A	*A*	A	No
5	State Route 37 from U.S. 101 to Atherton Ave.	C	C	C	C	*A*	B	No
6	Bel Marin Keys Blvd from U.S. 101 to Commercial Blvd.	F	E	C	C	*B*	C	Yes
7	U.S. 101 from North San Pedro Rd. to State Route 37*	D	D	C	E	*A*	A	Yes
8	U.S. 101 from Mission Ave. to N. San Pedro Rd.	F	D	F	F	*C*	**F**[1]	Yes
9	Sir Francis Drake Blvd. from San Anselmo Ave. to Red Hill Ave.	E	F	E	E	*C*	C	Yes
10	Red Hill Road from Sir Francis Drake Blvd to Hilldale Drive	D	D	D	C	*B*	D	No
11	U.S. 101 from Interstate 580 to Mission Ave.	F	D	F	F	*F*	E[1]	Yes
12	Sir Francis Drake Blvd. from College Ave. to Wolfe Grade	C	C	C	B	*C*	A	Yes
13	U.S. 101 from Sir Francis Drake Blvd. to Interstate 580*	D	F	F	F	*F*	E[1]	Yes
14	Interstate 580 from Bellam Blvd to - Sir Francis Drake Blvd.	A	B	B	F	*E*	E	Yes
15	Interstate 580 from Sir Francis Drake Blvd. to Richmond/San Rafael Bridge	C	F	E	C	*F*	E	No
16	East Sir Francis Drake Blvd from U.S. 101 to Larkspur Landing Circle	F	F	F	C	*F*	**E**	Yes
17	U.S. 101 from Shoreline Highway (S.R. 1 to Tiburon Blvd. (S.R. 131) *	D	D	C	F	*F*	**F**[1]	Yes
18	Tiburon Blvd. (State Route 131) from U.S. 101 to Strawberry Drive	C	C	C	C	*A*	A	No
19	Shoreline Highway (S.R. 1) from Northern Avenue to Almonte Blvd.	D	D	C	F	*B*	A	Yes
20	Bridgeway Blvd. (U.S. 101 to U.S. 101*	C	B	C	B	*B*	C	No
21	US 101 from San Francisco County Line to Shoreline Highway (State Route 1) *	D	D	C	C	*A*	A	No
22	Sir Francis Drake Blvd. from Butterfield Rd. to State Route 1 *	F	F	F	F	*D*	**F**	Yes
23	Sir Francis Drake Blvd. from College Ave. to Toussin Ave.	F	E	F	F	*C*	D	Yes
24	Novato Blvd. from Wilson Ave. to Diablo Ave. *	F	D	C	E	*C*	B	No
25	SR 1 (US 101-Tenn. Valley)	NA	NA	NA	NA	NA	B	No
26	2nd St. (Marquard St. - US 101)	NA	NA	NA	NA	NA	C	No
27	3rd St. (US 101-Marquard St.)	NA	NA	NA	NA	NA	D	No

* Indicate changes in roadway segment limits between 2007 and prior years.

[1] Indicates improved LOS later identified, resulting from US 101 HOV lane project completion in San Rafael.

TABLE 6. ACTIONS RECOMMENDED BY SEGMENT

#	Segment	2009	Peak Direction	Action Needed
	Non-Grandfathered, LOS Standard Met			
1	Shoreline Highway (State Route 1) from Sir Francis Drake Blvd to Pt. Reyes	A	Northbound	Within LOS Standard; No Action
3	Novato Blvd. from San Marin Dr/Sutro Ave to Wilson Ave*	C	Northbound	Within LOS Standard; No Action
4	South Novato Blvd from U.S. 101 to Novato Blvd.) *	A	Northbound	Within LOS Standard; No Action
5	State Route 37 from U.S. 101 to Atherton Ave.	B	Eastbound	Within LOS Standard; No Action
10	Red Hill Road from Sir Francis Drake Blvd to Hilldale Drive	D	Westbound	Within LOS Standard; No Action
15	Interstate 580 from Sir Francis Drake Blvd. to Richmond/San Rafael Bridge	E	Eastbound	Monitoring before additional US 101 Gap Closure lanes open
18	Tiburon Blvd. (State Route 131) from U.S. 101 to Strawberry Drive	A	Eastbound	Within LOS Standard; No Action
20	Bridgeway Blvd. (U.S. 101 to U.S. 101*	C	Northbound	Within LOS Standard; No Action
21	US 101 from San Francisco County Line to Shoreline Highway (State Route 1) *	A	Northbound	Within LOS Standard; No Action
24	Novato Bl. from Wilson Ave. to Diablo Ave. *	B	Northbound	Within LOS Standard; No Action
25	State Route 1 from US 101 to Tennessee Valley	B	Northbound	Within LOS Standard; No Action
26	2nd Street from Marquard Street to US 101	C	Eastbound	Within LOS Standard; No Action
27	3rd Street from US 101 to Marquard Street	C	Westbound	Within LOS Standard; No Action
	Grandfathered, LOS Standard Met			
6	Bel Marin Keys Blvd from U.S. 101 to Commercial Blvd.	B	Westbound	Within LOS Standard; No Action
7	U.S. 101 from North San Pedro Rd. to State Route 37*	A	Northbound	Within LOS Standard; No Action
9	Sir Francis Drake Blvd. from San Anselmo Ave. to Red Hill Ave.	C	Westbound	Within LOS Standard; No Action
11	U.S. 101 from Interstate 580 to Mission Ave.	E[1]	Northbound	Monitoring before additional US 101 Gap Closure lanes open
12	Sir Francis Drake Blvd. from College Ave. to Wolfe Grade	C	Westbound	Within LOS Standard; No Action
13	U.S. 101 from Sir Francis Drake Blvd. to Interstate 580*	E[1]	Northbound	HOV lanes reserved; to open when Segment 11 opens
14	Interstate 580 from Bellam Blvd to - Sir Francis Drake Blvd.	E	Eastbound	Within LOS Standard; No Action
19	Shoreline Highway (S.R. 1) from Northern Avenue to Almonte Blvd.	B	Northbound	Within LOS Standard; No Action
23	Sir Francis Drake Blvd. from College Ave. to Toussin Ave.	C	Westbound	Within LOS Standard; No Action
	Grandfathered, LOS Standard Not Met (no deficiency plan required)			
2	U.S. 101 from Atherton Ave. to Sonoma County Line	**F**	Northbound	Project to add lanes in development
8	U.S. 101 from Mission Ave. to N. San Pedro Rd.	**F**[1]	Northbound	Monitoring before additional US 101 Gap Closure lanes open
16	East Sir Francis Drake Blvd from U.S. 101 to Larkspur Landing Circle	**E**	Eastbound	Improvement Strategy in development; funded with toll bridge revenue (RM2)
17	U.S. 101 from Shoreline Highway (S.R. 1 to Tiburon Blvd. (S.R. 131) *	**F**[1]	Northbound	Monitoring before additional US 101 Gap Closure lanes open
22	Sir Francis Drake Blvd. from Butterfield Rd. to State Route 1 *	**F**	Westbound	Prior CMP indicated LOS D; Congestion to be Monitored

* Indicate changes in roadway segment limits between 2007 and prior years.

[1] Indicates improved LOS later identified, resulting from US 101 HOV lane project completion in San Rafael.

TABLE 7. RESULTING PERFORMANCE FOLLOWING US 101 GAP CLOSURE PROJECT COMPLETION (CENTRAL SAN RAFAEL)

Segment Number	Segment	Before Completion		After Completion	
		Speed	Level of Service	Speed	Level of Service
Southbound AM Peak Period					
7	Lucas Valley Road to Freitas Parkway	8.0	F	48.0	D
8	North San Pedro Road to Mission Avenue*	18.0	F	36.0	E
11	Mission Avenue to I-580	27.0	F	54.0	C
13	I-580 to Sir Francis Drake Boulelvard	42.0	E	65.0	A
Northbound PM Peak Period					
17	State Route 131 to Paradise Drive	17.0	F	49.0	D
13	Sir Francis Drake Boulelvard to I-580	14.0	F	61.0	A
11	I-580 to Mission Avenue	16.0	F	64.0	A
8	Mission Avenue to North San Pedro Road	28.0	F	58.0	B

* Project capacity not fully implemented on this segment when monitoring occurred. Additional width for shoulders and an auxiliary lane will further enhance operations between North San Pedro and Lincoln.

Source: Transportation Authority of Marin

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3.0 SYSTEM PERFORMANCE

3.1 Purpose and Intent of Legislation

The California Government Code requires the Congestion Management Agency to establish performance measures to evaluate current and future multimodal system performance (in addition to the level of service presented in Chapter 2) for the movement of people and goods.[4] Consistent with past CMPs, performance measures are included in this CMP and described in this chapter. The measures should not be confused with "standards," as no level of performance is required. Rather, a measure simply indicates the level of performance at a given time.

The first part of this section describes the current transit system in Marin. The next section describes bicycle and pedestrian programs. Then, six additional performance measures are provided (reported in this and prior CMPs):

1. Peak-Hour Travel Time
2. Person Throughput
3. Vehicle Miles Traveled on Congested Highways
4. Jobs/Housing Balance
5. Transit Headways
6. Transit Coordination

The performance measures help determine whether the goals of the CMP are being met: supporting mobility, air quality, land-use, and economic objectives. The measures are also used in the development of the Capital Improvement Program, deficiency plans, and the land-use analysis program. A *Transportation System Performance Monitoring Report* prepared by PHA Transportation Consultants for TAM in February 2009 contains detailed information on these measures.

3.2 Existing Transit Operations in Marin County

The transit network is comprised of a variety of services within Marin County. These include:

- General public transit bus service for both inter- and intra-county trips;
- General public ferry service, serving trips between Marin County and San Francisco;
- Specialized transit services aimed at serving the needs of the elderly and disabled populations in the County; and

4 California Government Code Section 65089(b)(2)

- Privately operated services, providing targeted service between specific locations, such as the service between Marin County and San Francisco International Airport.

The criteria used to establish CMP routes are:

- One-way, monthly ridership is greater than 5,000.
- Inter-county transit service using modes other than buses.

The following sections provide a brief description of the transit services provided for inter-county and intra-county transit travel. Following this discussion, bus route information and headways as well as overall transit ridership are summarized in this section.

3.2.1 Marin Transit

The Marin County Transit District (Marin Transit) is the agency responsible for local transit service within Marin County. Although Marin Transit has responsibility for local transit services, it does not own any facilities and does not employ its own drivers. Instead, Marin Transit contracts with other operators for three types of fixed route services within the county: large bus fixed route, shuttle, and rural service. Contracted providers include Golden Gate Transit (GGT), MV Transportation and Marin Airporter. Marin Transit also contracts with Whistlestop Wheels to provide paratransit and dial-a-ride service within Marin County. Table 8 summarizes the regularly scheduled Marin Transit services.

Transit service provided within Marin County by Marin Transit via contractors include:

- **Local Service.** Twelve routes operate entirely within Marin County on weekdays, with limited weekend service, contracted through Golden Gate Transit. An additional six routes are operated as school-focused service on school days only, as detailed below.
- **School Service.** Routes 113, 117, 126, 127, and 139 provide limited service on school days in Marin County, as well as select trips on routes 17,19, 23, 45, and 51. These trips are also operated by GGT through a contract with Marin Transit. (Routes 107, 115, 123, 125, 143, 145, 151 and 153 -- which operated as these route numbers in 2007 have been renamed to represent the local route that operates along the same streets.
- **Recreational Services.** A shuttle service, Route 66, operates between Muir Woods and Marin City and Sausalito. Schedules on the shuttle are adapted to the weekend and seasonal characteristics of the recreational travel demand. Starting May 2009, Marin Transit contracts with GGT to operate Route 66, in partnership with the National Park Service. Service for this route is only provided between May and September.
- **West Marin Stagecoach.** Marin Transit contracts with MV Transportation to operate the West Marin Stagecoach with three shuttle service routes in West Marin. The Stagecoach provides weekday and weekend service to residents and visitors of this area.
- **Community Shuttle Service.** Marin Transit contracts with Marin Airporter to operate three shuttle bus routes providing limited service in San Rafael/Santa Venetia, Terra

Linda/Marinwood and Larkspur/Corte Madera. Marin Airporter also provides airport shuttle service between Marin County and San Francisco Airport as its primary business, separate from Marin Transit operations.

- **Paratransit Service and Dial-a-Ride Service.** Marin Transit contracts with Whistlestop Wheels to provide paratransit services described further in section 3.2.5. Whistlestop Wheels is also under contract with Marin Transit to operate the new Novato Dial-a-Ride (DAR), which replaced the EZ Rider in Novato. The Novato DAR provides door-to-door service in Novato designed to fill service gaps in the community. Whistlestop Wheels provided a similar service in Muir Beach; the Muir Beach DAR was discontinued in July 2009. In addition, Whistlestop Wheels operates the Novato Health Express, a medical-only shuttle service for elderly and disabled residents of the Novato area provided in cooperation with Novato Community Hospital, a Sutter Health affiliate and the Hamilton Shuttle (which is not managed by Marin Transit).

TABLE 8. MARIN TRANSIT ROUTES AND HEADWAYS FOR FIXED ROUTE SERVICE

As of August 2007			As of August 2009		
Route	**Route Type: Description**	**Approx. Headway (minutes)**	**Route**	**Route Type: Description**	**Approx. Headway (minutes)**
113	School: Paradise Cay to Redwood H.S	1 run	113	School: Paradise Cay to Redwood HS	1 am, 4 pm
114	School: Redwood HS to S Rafael Transit Ctr (summer)	1 run	114	School: Redwood HS to S Rafael Transit Ctr (summer)	1 run
17	Local: Marin City to San Rafael	11-30	17	Local: Marin City to San Rafael	5-60
117	School: East Corte Madera to Hall M.S.	1	117	School: East Corte Madera to Hall MS	2 am, 4 pm
19	Commute: Marin City to Tiburon	60	19	Local: Tiburon to Marin City	27-60
22	Local: San Anselmo to Sausalito	30-54	22	Local: San Rafael to Sausalito	8-51
23	Local: Fairfax to San Rafael	30	23	Local: San Rafael to Manor	4-30
126	School: San Rafael to Brookside Schools	1-5	126	School: San Rafael to San Domenico Schl	1-5
127	School: Sleepy Hollow to White Hill	9-48	127	School: Sleepy Hollow to White Hill Schl	9-60
29	Basic: San Rafael to San Anselmo	30	29	Local: San Rafael to San Anselmo	30-60
132	Did not exist		132	School: San Rafael HS to Peacock Gap	1 am, 1 pm
35	Basic: East SR to San Rafael to Marin City	9-30	35	Local: San Rafael to Canal Area	4-31
			36	Local: San Rafael to Marin City	30-60
139	School: Lucas Valley to Terra Linda High	20-30	139	School: Terra Linda HS to Lucas Valley	3 runs
45	Local: San Rafael to Kaiser Hosp/ Northgate	60	45	Local: San Rafael to Kaiser Hosp Ngate	4-60
49	Local: San Rafael to Ignacio	60	49	Local: San Rafael to Ignacio	55-61
51	Local: San Marin to Ignacio	60	51	Local: San Marin to Ignacio	8-61
52	Local: Novato to Ignacio	59	52	Local: Novato to San Rafael	46-64
61	West Marin Stagecoach: Manzanita (Mar City) to Bolinas	160	61	West Marin Stagecoach: Manzanita (Mar City) to Bolinas	160
62	West Marin Stagecoach: San Rafael to Stinson Beach	120 (Tues/ Thur/ Sat)	62	West Marin Stagecoach: San Rafael to Stinson Beach	120 (Tues/ Thur/ Sat)
66	Muir Woods Shuttle: Manzanita (Mar City) to Muir Woods	30	66	Muir Woods Shuttle: Manzanita (Mar City) to Muir Woods	20-30
68	West Marin Stagecoach: Inverness to Fairfax	195	68	West Marin Stagecoach: Inverness to Fairfax	195
71	Local: Novato to Marin City		71	Local: Novato to Marin City	30
221	Larkspur Ferry Corte Madera	60	221	Larkspur Ferry Corte Madera	60
233	Santa Venetia - San Rafael	60	233	Santa Venetia - San Rafael	60
259	Shuttle: Marin Civic Center - Marinwood	60	259	Shuttle: Marin Civic Center - Marinwood	60

Source: Golden Gate Transit Website, 2009.

3.2.2 Golden Gate Transit Regional Bus Service

Golden Gate Transit (GGT) is the primary operator of public transit services in the county, serving both intra-county trips (via a contract with Marin Transit) and travel between Marin County and Sonoma, San Francisco, and Contra Costa Counties. GGT is one of three operating divisions of the Golden Gate Bridge, Highway and Transportation District.

Additional bus services provided directly by GGT connect Marin County to other parts of the region. The inter-county bus routes that operate partly inside Marin County are listed in Table 9, and include:

- **Transbay Basic Service.** Basic service routes operate all day, seven days per week, providing wheelchair accessible trunk-line service between the Transbay Terminal and Civic Center in San Francisco or Richmond BART, and various suburban centers within Marin and Sonoma Counties. They provide the "backbone" service both within Marin County and between Marin and neighboring counties. The six routes are Routes 10, 40/42, 70 , 80, and 101.
- **Transbay Commute Service.** This service provides 19 routes that operate on weekdays except holidays. Most services connect residential neighborhoods within Marin County and the San Francisco Financial District and Civic Center employment centers during the A.M. and P.M. commute periods. Other service connects Sonoma County with Marin County and San Francisco. Commute service is generally operated in the peak direction during commute hours only, and is not run at all during the midday and off-peak periods.

TABLE 9. REGIONAL GOLDEN GATE BUS TRANSIT ROUTES AND HEADWAYS

As of August 2007			As of August 2009		
Route	Route Type: Description	Approx. Headway (minutes)	Route	Route Type: Description	Approx. Headway (minutes)
101	Did not exist		101	Basic: Santa Rosa to SF	3-60
2	Commute: SF to Marin Headlands	15-21	2	Commute: SF to Marin Headlands	15-32
4	Commute: Mill Valley to SF	10	4	Commute: Mill Valley to SF	5-45
8	Commute: Tiburon to SF	51	8	Commute: Tiburon to SF	51
9	Commute: Tiburon Ferry to Strawberry	85	9	Does not exist	
10	Basic: Sausalito to Tiburon	60	10	Basic: Strawberry to SF	30-60
18	Commute: College of Marin to SF	16-29	18	Commute: College of Marin to SF	11-30
24	Commute: Fairfax to San Rafael	7-11	24	Commute: Lagunitas to SF	8-76
26/27	Commute: Sleepy Hollow to SF	2 runs	26/27	Commute: Sleepy Hollow to SF	5-74
38	Commute: Terra Linda to SF	27	38	Commute: Terra Linda to SF	27-31
40/42	Basic: San Rafael to Del Norte BART	11-40	40/42	Basic: San Rafael to Del Norte BART WD	13-60
42	Did not exist		42	Basic: San Rafael to Del Norte BART WE	60
44	Commute: Lucas Valley to SF	35-60	44	Commute: Marinwood to SF	13-62
54	Commute: San Marin to SF	16-30	54	Commute: San Marin to SF	17-52
56	Commute: Novato to SF	12-27	56	Commute: Novato to SF	30
58	Commute: SF to Hamilton/Ignacio	25	58	Commute: SF to Novato	25-30
60	Commute: San Rafael to SF	4 runs	60	No longer operates (see 70/71/80)	
70	Basic: Novato to SF		70	Basic: Novato to SF	3-60
72	Commute: Santa Rosa to SF	2-40	72/72X	Commute: Santa Rosa to SF	8-37
73	Commute: Santa Rosa to SF	4 runs	73	Commute: Santa Rosa to SF	49-60
74	Commute: Santa Rosa to SF	5 runs	74	Commute: Santa Rosa to SF	30-50
75	Commute: Santa Rosa to East San Rafael	4 runs	75	Commute: Santa Rosa to San Rafael	30-46
76	Commute: East Petaluma to SF	7-23	76	Commute: East Petaluma to SF	4-33
80	Basic: Santa Rosa to SF	30	80	Basic: Santa Rosa to SF	3-60
91	Commute: Larkspur Ferry to SR Transit Ctr	30-60	91	No longer operates	
92	Did not exist		92	Commute: Marin City to SF	30-60
93	Commute: GG toll plaza to Mission Street	15	93	Commute: GG toll plaza to SF Civic Center	10-35
97	Commute: Larkspur Ferry to San Rafael	1 run	97	Commute: Larkspur Ferry to SF	1 run

Source: Golden Gate Transit Website, 2009.

3.2.3 Ferry Services

Three organizations provide Ferry service in Marin County:

- **Golden Gate Ferry Service.** The Golden Gate Bridge, Highway and Transportation District operates ferry services from Larkspur and Sausalito to San Francisco. The District has five ferry vehicles, two of which are higher-speed ferries acquired since 1998.
- **Blue and Gold Fleet.** The Blue and Gold fleet operates both commuter and recreational ferry service between Marin County (Tiburon) and San Francisco. Blue and Gold also provides recreational service between Marin County (Sausalito) and San Francisco (Fisherman's Wharf).
- **Angel Island Ferry.** A ferry service connects Downtown Tiburon to Angel Island. The ferry takes about 10 minutes to travel between the two destinations. The privately owned ferry boat operates several trips a day year-round, varying by season and day of the week.

3.2.4 Summary of Fixed Route Service and Boardings

The routes sponsored by Marin Transit are routinely monitored for performance. The dedication of additional resources has led to an expansion of local transit service, which in turn has increased local boarding. These trends are demonstrated in Table 10. Also in Table 10, ridership trends in Golden Gate Transit Bus and Ferry Ridership are reported. These services have shown relatively flat demand in the past three reported years.

TABLE 10. TRANSIT RIDERSHIP TRENDS IN MARIN

Fiscal Year	Revenue Hours	Boardings
Golden Gate Basic and Commuter Service		
2005-06	283,335	4,937,215
2006-07	258,527	3,997,163
2007-08	265,445	4,114,323
Golden Gate Ferry Service		
2005-06	13,775	1,870,169
2006-07	13,630	2,024,935
2007-08	14,061	1,980,010
Marin Transit Sponsored Local Service		
2005-06	84,763	2,496,472
2006-07	110,608	3,216,243
2007-08	113,554	3,259,037
Marin Transit Shuttles and West Marin Routes (and Muir Beach Dial A Ride)		
2005-06	6,487	26,996
2006-07	12,503	55,665
2007-08	16,140	86,199

Source: Marin County Transit District 2009 SRTP and Golden Gate Transit Ridership Summaries

3.2.5 Specialized Transit Services

- **Paratransit Service.** Marin Transit contracts with the Whistlestop Wheels to provide local paratransit services which are available between 6 A.M. to 1 A.M,. seven days a week. Approximately 50 lift-equipped vehicles are used to provide service, which is a door-to-door ridesharing program. Approximately 99,000 annual passenger trips are provided on local Whistlestop Wheels paratransit service. Inter-county paratransit service is provided seven days a week, under an agreement between Golden Gate Transit and Marin Transit. The inter-county service area includes Sonoma, San Francisco, and Contra Costa counties in addition to Marin county. The statistics for this service are included in Table 11.

TABLE 11. WHISTLESTOP WHEELS PERFORMANCE STATISTICS, FY 2000 TO FY 2009

Fiscal Year	Passenger Trips	Revenue Hours
2000-01	70,293	37,930
2001-02	76,122	37,769
2002-03	76,609	37,812
2003-04	83,764	38,820
2004-05	83,961	39,197
2005-06	86,465	39,458
2006-07	91,628	41,966
2007-08	94,813	43,292
2008-09	98,808	46,967

Source: Marin County Transit District ; 2007 Marin CMP

3.3 Bicycle and Pedestrian Programs

TAM and other jurisdictions have a commitment to non-motorized transportation programs. This commitment extends to all levels of planning and funding, including a portion of TAM-administered Measure A funds. Strategy 4 of the Measure A Strategic Plan specifically designates shares to help fund Safe Routes to Schools, Crossing Guards, and Safe Pathways to School programs. In addition, local transportation infrastructure projects funded by Strategy 3, make bicycles and pedestrians eligible for funding. The measure's Strategy 1 also funds Lincoln Hill Multi-Use Path as part of the US 101 HOV gap closure project.

Marin County also participates in a Federally-funded Non-Motorized Transportation Pilot Program as one of four demonstration locales spread throughout the nation. This project, funded by Section 1807 of the Federally-authorized SAFETEA-LU legislation, provides a way to measure the performance and results of investments in the bike/ped system that has become a national model.

Highway projects in Marin County also consider bicycle and pedestrian needs in their design and construction. Active elements for bicycle and pedestrian needs are included in these projects:

- US 101 Marin/Sonoma Narrows project
- Tiburon Wye
- Greenbrae Corridor Improvement Project
- 580/101 Interchange (Bellam Boulevard & E. Francisco Boulevard)

Marin County benefits from having several projects funded by Regional Measure 2. These projects include:

- Full funding of the Cal Park Hill Tunnel Project
- Design and Phase 1 construction of the Central Marin Ferry Connector Project across Sir Francis Drake Boulevard.
- Safe Routes to Transit grant to San Rafael for a multi-use connector between Lincoln Hill Path and Downtown Transit Center

Additional funding of bicycle and pedestrian improvements in Marin County are provided through targeted funding sources, including:

- Transportation Funds for Clean Air (TFCA)
- Transportation Development Act (TDA) Article 3
- Regional Bicycle/Pedestrian Funds
- Measure A County ½ Cent Sales Tax

In response to these programs, local jurisdiction staff have identified some of the significant contributions to local pedestrian and bicycle projects. These are summarized in Table 12. These include several Measure A Safe Routes to School programs, such as Safe Pathway projects, education programs in schools, and crossing guards.

TABLE 12. LOCAL PEDESTRIAN AND BICYCLE PROJECT HIGHLIGHTS

Jurisdiction	Monitoring Results
Belvedere	Installed 10 handicapped access ramps throughout the city and hire a consultant to review city crosswalks for safety upgrade.
Corte Madera	Replaced/or installed 30 ADA curb ramps, replaced 5,000 sf of sidewalk for ADA compliance at various locations, replaced 8,300 sf of pedestrian/bike paths (along High Canal and at Town Park), repaired Low Canal pedestrian bridge at Town Park. Currently under construction and due to be complete this spring is our Safe Routes to Schools project, Safe Pathways to Schools project, and ½ mile of ped/bike path at Bayside Trail.
Fairfax	Currently conducting San Rafael/Fairfax Bicycle Feasibility and a Parkade Circulation Study, which focused on bicycle and pedestrian access.
Larkspur	Applied and received funding for Doherty Drive Class I bike lane and pedestrian path. SFD Boulevard Bike and Pedestrian Multi-use Bridge: Project: PS&E complete; awaiting encroachment permit from CALTRANS. Magnolia Avenue Class I bike lane and pedestrian path extension project: Construction 95% complete; completion targeted for January 2009.
Mill Valley	The City installed "Share the Road" markings in thermoplastic to identify the bike route on Ashford Ave between Lomita and Meadow and on Miller Avenue between Sunnyside and Millwood Avenues. The City rehabilitated pubic stairs off of Elinor Avenue, and between Molino and Mirabel Avenues.
Novato	Completed a street rehab project on Novato Boulevard including bike lanes and striping, and new bike loop detectors and signs. Re-striping and re-establish northbound bike lane on Novato Boulevard between 7th Street and Grant. Initiated a class 1 bike lane commuter connection from South Novato Boulevard to Enfrennte. The project is in design stage.
Ross	Currently working on a pedestrian path project on Sir Francis Drake Boulevard between town limits, and a Shady Lane Safe route to School pedestrian path project.
San Rafael	Installed over 23 miles of Class III bicycle facilities. Developed Bicycle/Pedestrian Master Plan 2008 Update. Obtained funding for and started design of pedestrian improvements on Happy Lane near Sun Valley Elementary School, on Woodland Avenue near Laurel Dell Elementary School, and at various intersections on Canal Street and Kerner Boulevard. Obtained Non-motorized Transportation Pilot Program funding for the Francisco Boulevard East Improvements, the Mahon Creek Path-Transit Center Connector Project, the Northgate Gap Closure Project, the Puerto Suello Hill Path-Transit Center Connector project, and the North San Rafael Improvements Project. Completed construction of sidewalk and other pedestrian improvements near San Rafael High School project, Bahia Vista Elementary School and Vellecito Elementary School.
Sausalito	Updated our bike plan and implemented a Personal Travel Planning Project called "Way to Go Sausalito", administered by Marin County.
San Anselmo	No project reported this cycle year.
Tiburon	Currently working on a Del mar School Safe Route to School project, and a Non-motorized Pilot Program project to rehabilitate 3 pedestrian access ways.
Marin County	Prepare and coordinate Countywide Master Bike Plan Update in conjunction with towns and cities with county jurisdictions. Constructed class II bike lanes on Atherton Avenue between Bugeia Lane and School Road, Almonte Boulevard (TAM Valley), College Avenue (Kenfield), Las Gallinas Avenue (Marinwood) , Widened shoulders on several west Marin roads, including SFR Boulevard. Coordinated countywide SIGNAGE PROGRAM. Initiated design and construction of Cal Park Tunnel, Ranchitos Road bike lanes, Alameda del Prado bike lanes, Tennessee Valley Pathway, and County health access improvements. Completed NMTPP (Non-Motorized Transportation Pilot Project) bicycle and pedestrian counts at various locations.

Source: PHA Consultants, 2009.

With regard to Measure A funds, Strategy #4 of the sales tax programming includes a suite of Safe Routes to Schools (SR2S) programs. The Marin SR2S program, one of the most successful in the country, is designed to reduce local congestion around schools by increasing the number of children walking and biking to school. TAM's SR2S strategy includes:

- **Education and Encouragement programs**, offering events, contests and promotional materials to encourage children to walk and bicycle to school. Programs to support carpooling and transit use are also provided to the schools.
- **Crossing Guard programs** providing trained crossing guards at key intersections throughout Marin County. Use of crossing guards can reduce the reluctance parents may have in allowing their children to walk or bicycle to school.
- **Safe Pathways** -- the capital improvement element of the SR2S program -- provides funding for the engineering, environmental clearance, and construction of pathway, street crossing and sidewalk improvements for better and safer access to schools

3.4 Performance Measures

The six additional performance measures described below allow TAM to further measure transportation system performance in Marin County.

3.4.1 Aggregate Peak Hour Travel Time

This performance measure describes the time required to travel through selected corridors on a variety of modes. Because single-occupant, high-occupant, and transit vehicles travel at different speeds, aggregate travel time between two points for all modes effectively describes the system's performance. To determine peak-hour travel times by single-occupant and high-occupant vehicles, travel time runs would be required for two given days at the peak hour in the peak direction. Transit schedules have been used to determine travel times via buses. For the Marin CMP, aggregate travel times have been developed for four segments:

1. U.S. 101 between the Sonoma County line and San Rafael Transit Center
2. U.S. 101 between San Rafael Transit Center and the Golden Gate Bridge
3. Sir Francis Drake Boulevard between Butterfield Road and U.S. 101
4. Red Hill Avenue, Second and Third streets between Sir Francis Drake Boulevard and San Rafael Transit Center

Table 13 lists the results of the peak hour travel time monitoring. The samples for the AM peak hour began between 7:30 and 8:30 AM, and the samples for the PM peak hour began between 4:30 and 5:30 PM.

TABLE 13. CORRIDOR PEAK HOUR TRAVEL TIME MONITORING RESULTS

			2006 (minutes)			2008 (minutes)		
Study Corridor			**Auto**	**HOV**	**Bus**	**Auto**	**HOV**	**Bus**
U.S. 101 from San Rafael Transit Center to Sonoma County Line	AM	NB	18	18	45(A)	17	N/A	46 (A)
		SB	30	29	66(A)	47	24	68 (A)
	PM	NB	25	26	51(A)	26	24	63 (A)
		SB	19	N/A	52(A)	22	N/A	59 (A)
U.S. 101 from San Rafael Transit Center to Golden Gate Bridge	AM	NB	13	N/A	40(B)	12	N/A	43 (A)
		SB	13	13	31(B)	12	11	36 (A)
	PM	NB	19	17	47(B)	25	17	48 (A)
		SB	12	N/A	35(B)	12	N/A	50 (A)
Sir Francis Drake Boulevard from Butterfield Rd. to U.S. 101	AM	NWB	12	N/A	N/A	11	N/A	N/A
		SEB	17	N/A	31(C)	18	N/A	33
	PM	NWB	14	N/A	26(C)	17	N/A	21
		SEB	12	N/A	N/A	13	N/A	N/A
Red Hill Avenue from Sir Francis Drake Boulevard to San Rafael Transit Center)	AM	NWB	7	N/A	17(D)	6	N/A	13 (D)
		SEB	7	N/A	N/A	7	N/A	N/A
	PM	NWB	7	N/A	19(D)	8	N/A	13 (D)
		SEB	7	N/A	N/A	7	N/A	N/A

Source: PHA Consultants. Travel time runs were conducted three times in each direction during the commute periods. Transit travel times were estimated based on bus schedules. (A) Estimated based on commute bus Route 70 & 80 between San Rafael Transit Center – Petaluma Depot (B) Estimated based on commute bus route 70 & 80 from San Rafael Transit Center and Golden Gate Bridge Toll Plaza. (C) Estimated based on commute bus Route 24 between San Anselmo Transit Hub and US 101/Lucky Drive Bus Pad. (D) Estimated based on commute bus Route 24 between San Rafael Transit Center and SFD/Butterfield intersection.

Note: Travel Times shown were collected prior to the Gap Closure lane additions in 2009

3.4.2 Person Throughput

This performance measure identifies the number of people, not vehicles, who are able to move over a given facility in the peak period. As a combination of vehicle occupancy and level of service, this measure recognizes that transit service and HOV lanes can benefit corridor capacity. Roadways capacity is defined in terms of vehicles per hour. Well-utilized HOV lanes can contribute to roadway capacity, as they can carry more persons per lane than a mixed-flow lane. Finally, buses are defined as additional roadway capacity.

Existing conditions for this measure are obtained through a regular monitoring process. Monitoring of this measure requires that the number of riders and the seats on buses in a peak hour in each direction be defined. It requires observing travel volumes, as well as the average vehicle occupancy on a given mixed-flow or HOV lane. These locations are on CMP facilities that are representative congestion points, including:

- U.S. 101 between Interstate 580 and Central San Rafael
- U.S. 101 between Paradise Drive and the Tiburon Boulevard
- U.S. 101 north of Atherton Avenue
- Sir Francis Drake Boulevard west of U.S. 101
- Sir Francis Drake Boulevard north of Red Hill Avenue
- Red Hill Avenue east of Sir Francis Drake Boulevard

Table 14 lists the results of the person throughput monitoring for the P.M. peak hour period for six designated roadway segments.

TABLE 14. PERSON THROUGHPUT MONITORING RESULTS – PM PEAK HOUR

Segment	2006				2008			
	Transit Person	Auto Person	Van Pool Person	Total Person	Transit Person	Auto Person	Van Pool Person	Total Person
US 101- NB (I-580 – Central San Rafael)	880	6,758	350	7,988	880[1]	11,721	135	11,976
US 101 - NB (SR 131 – Paradise Dr.)	1100	6,762	250	8,112	1100[1]	8,895	72	9,607
US 101 - NB (North of Atherton)	520	3,846	250	4,616	520[1]	4,099	135	4,754
Sir Francis Drake Boulevard – NWB (East of Wolf Grade)	190	2,381	10	2,581	190[1]	2,017	24	2,231
Sir Francis Drake Blvd – NWB (North of Red Hill Rd)	646	2,165	20	2,831	646[1]	1,845	47	2,082
Red Hill Avenue – NWB (East of SDF Boulevard)	190	1,736	10	1,936	190[1]	2,103	23	2,354

Source: Source: PHA 2006 and 2008 traffic survey.
Note: [1.] 2008 Transit Person data under review; 2006 Transit Person data used.
The above analysis is for the commute direction only, i.e. leaving San Francisco and/or US 101.
Transit person were estimated based on actual bus count in the field times an estimated load of 38-person/bus for Sir Francis Drake Boulevard and Red Hill Avenue, and 40-person/bus for US 101 locations. 511.org vanpool division provided vanpool data.

3.4.3 Vehicle Miles of Congested Highway

This performance measure, derived from the Marin Travel Model, measures vehicle miles traveled on congested segments of the major freeway and arterial system in Marin County. Congested segments are highway segments at LOS E or worse (volume-to-capacity ratio greater than one). This measure provides an understanding of the relative extent of congestion on the County roadway system.

Prior to the Gap Closure project, the total PM peak hour vehicle miles traveled in congested conditions was 62,310, representing 10% of the congestion of PM peak vehicle miles traveled (VMT) on all roadways. Completion of the Gap Closure resulted in a reduction of approximately 18,000 vehicle miles traveled on congested roadways during PM peak hour; a relative 18,000 VMT was removed from congested conditions in the PM peak hour through that project.

In the future, roadway congestion is predicted to increase in Marin County. Table 15 lists the modeling results for vehicle miles traveled on congested roadways in future year 2035.

TABLE 15. PM PEAK VEHICLE MILES ON CONGESTED ROADWAY FORECASTING RESULTS

Measure	2009 (after gap closure)	2035	% Changes
Total PM Peak Hour Vehicle Miles Traveled	627,136	812,950	29.63%
Total PM Peak Hour Vehicle Miles Traveled in Congested Conditions	43,935	235,079	435.06%
Percent Vehicle Miles Traveled in Congested Conditions	7.0%	28.9%	312.86%

Source: Marin County Travel Model Based on ABAG Projections 2007 – Transportation Authority of Marin, August 2009

3.4.4 Jobs/Housing (Employed Residents) Balance

This performance measure considers the balance between projected employed residents and projected jobs within different planning areas of the county. Achieving a balance between jobs and housing within a community or area can help the regional transportation system by reducing the length of trips and traffic congestion. Table 16 lists the results of Bay Area Jobs-Housing balance projections.

TABLE 16. BAY AREA JOBS / HOUSING BALANCE PROJECTIONS

Category	2005	2020	% Change	2035	% Change
Employed Residents					
Alameda	705,900	883,900	25.22%	1,131,200	27.98%
Contra Costa	459,600	580,100	26.22%	717,600	23.70%
Marin*	**122,200**	**138,900**	**13.67%**	**152,500**	**9.79%**
Napa	64,100	72,900	13.73%	85,400	17.15%
San Francisco	388,100	421,700	8.66%	518,800	23.03%
San Mateo	318,600	398,500	25.08%	468,000	17.44%
Santa Clara	734,000	1,067,400	45.42%	1,326,600	24.28%
Solano	194,900	262,000	34.43%	326,600	24.66%
Sonoma	237,700	255,500	7.49%	289,800	13.42%
Total Jobs					
Alameda	730,270	902,180	23.54%	1,099,550	21.88%
Contra Costa	379,030	472,910	24.77%	591,650	25.11%
Marin*	**135,370**	**149,860**	**10.70%**	**165,180**	**10.22%**
Napa	70,690	85,460	20.89%	98,570	15.34%
San Francisco	553,090	684,310	23.72%	832,860	21.71%
San Mateo	337,350	423,100	25.42%	522,000	23.38%
Santa Clara	872,860	1,098,290	25.83%	1,365,810	24.36%
Solano	150,520	187,810	24.77%	227,870	21.33%
Sonoma	220,460	276,780	25.55%	344,290	24.39%
Jobs/Residents Ratio					
Alameda	1.03	1.02	-1.34%	0.97	-4.77%
Contra Costa	0.82	0.82	-1.15%	0.82	1.14%
Marin*	**1.11**	**1.08**	**-2.61%**	**1.08**	**0.39%**
Napa	1.10	1.17	6.30%	1.15	-1.54%
San Francisco	1.43	1.62	13.87%	1.61	-1.07%
San Mateo	1.06	1.06	0.27%	1.12	5.05%
Santa Clara	1.19	1.03	-13.48%	1.03	0.06%
Solano	0.77	0.72	-7.18%	0.70	-2.67%
Sonoma	0.93	1.08	16.80%	1.19	9.67%
Import(Export) Workers					
Alameda	24,370	18,280		-31,650	
Contra Costa	-80,570	-107,190		-125,950	
Marin*	**13,170**	**10,960**		**12,680**	
Napa	6,590	12,560		131,170	
San Francisco	164,990	262,610		314,060	
San Mateo	18,750	24,600		54,000	
Santa Clara	138,860	30,890		39,210	
Solano	-44,380	-74,190		-98,730	
Sonoma	-17,240	21,280		54,490	

Source: Marin County Traffic Model, Transportation Authority of Marin; ABAG Projections 2007.

3.4.5 Transit Headway

This performance measure presents the time intervals, or headways, between successive in-service transit vehicles that pass by a single point. Proper headways ensure that individual routes operate at frequencies that are appropriate to the type of service they provide and adequately address both existing and potential ridership demand.

3.4.5.1 GOLDEN GATE TRANSIT TRANSBAY BUS SERVICE

Golden Gate Transit Bus Service has made slight adjustments in transbay transit service since 2007, providing resources where the greatest demand exists on various routes. Detailed information on current schedules may be viewed on the Golden Gate Bridge, Highway & Transportation District website at http://www.goldengate.org. Headways for Marin Transit Routes and other Golden Gate Bus Transit Routes are found on Table 8 and Table 9.

3.4.5.2 GOLDEN GATE TRANSIT FERRY SERVICE

Golden Gate Transit continues to operates ferry services from two ports in Marin County as it did in 2007:

- Larkspur to San Francisco (30 minute peak direction headways)
- Sausalito to San Francisco (70 minute peak direction headways)

3.4.5.3 BLUE AND GOLD FERRY SERVICE

Blue and Gold Ferry operates from two ports in Marin County as it did in 2007:

- Tiburon to San Francisco (60 minute peak direction headways)
- Sausalito to San Francisco (80 minute peak direction headways)

3.4.6 Transit Coordination

This performance measure considers the extent to which transit service is integrated between service types and modes and with other transit services within the county or in adjacent counties. The coordination of regional transit services enhances seamless regional transit travel. Transit schedule coordination is measured at key transfer facilities between local and regional services. Table 17 lists the efforts for transit coordination with an indication of the objective, target and results of the 2009 monitoring.

TABLE 17. TRANSIT COORDINATION EFFORTS

Objective	Target	Monitoring Results (2008)
Convenient transfer within Marin County	Continue operation of existing transfer locations and establish additional locations and facilities.	All seven local and regional bus hubs in Marin County are in operation. No new facility was being considered.
Convenient regional transit connection	Continue coordination of regional service and fares with those of other local transit operators in Marin, San Francisco, and Sonoma Counties, and work toward joint fare agreement and service coordination with other public transit operators in the Bay Area	All local and regional transfers among local shuttles, Golden Gate Transit, and West Marin Stagecoach are accepted in Marin County through Marin County Transit District (Marin Transit coordination).
Level of coordination with other modes	Continue to work with ride sharing agencies to increase the number of vanpool and carpools to jobs in Marin and San Francisco, as well as to facilitate bicycle and pedestrian access to transit routes.	Marin Transit had suggested a number of capital projects to improve pedestrian and bicycle access to transit. This includes a project to convert current two-capacity bicycle racks on transit vehicle s to three capacity racks and a project to install more bicycle racks at high use bus stops.
Discount fares for senior and youth	Continue to provide discounted transit fare for seniors 65 and older and students 6-18.	Marin Transit has a 50% discount for youth and seniors age 65+. Marin Transit has six month youth passes at a discount for frequent riders and free to low-income youth riders. Marin Transit 's board adopted new daily, monthly and weekly passes for all fare categories that will launch in 2009.
Deficiency plan participation	Work with local operators, local jurisdictions and Bay Area Air Quality Management District to implement transit improvements as potential deficiency plan actions.	Marin Transit has not been involved in deficiency plans but will participate if invited.

Note: Regional and local bus hubs: San Rafael Transit Center, Marin City Hub, Novato, San Anselmo, Strawberry, Marin Civic Center, Tiburon Ferry Terminal, Sausalito Ferry Terminal, Larkspur and Ignacio bus pad.

3.4.7 Mode of Access

For information purposes, data regarding the mode of travel for Marin work trips is included in this CMP. The percentage of modes chosen for traveling to work is sampled as part of the research performed by the U.S. Bureau of the Census. This information was sampled in the 2000 Census as the "long form", which went to a subset of all households. Beginning in 2005, the Bureau began sampling a smaller subset of the households for "long form" information, and they are now publishing a three-year rolling average of responses to these questions.

The proportion of modes chosen for journey to work can now be compared for both 2000 Census and the 2005-2007 American Community Survey (ACS) three year data set. The comparison between these two conditions for Marin is detailed in Table 18. It should be noted that for the 2000 Census data, taxi trips were considered public transportation trips while they were considered carpool trips in the American Community Survey; the adjustment was made to place taxis into the other category for both years.

TABLE 18. JOURNEY-TO-WORK MODE OF ACCESS FOR MARIN COUNTY

	2000 Census		2005-2007 American Community Survey	
Mode	**Number**	**%**	**Number**	**%**
Drive	81,169	67.0%	83,325	65.8%
Carpool	12,109	10.0%	13,597	10.7%
Public Transportation	9,044	7.5%	12,797	10.1%
Bicycle	1,640	1.4%	1,233	1.0%
Walk	4,017	3.3%	3,835	3.0%
Other	969	0.8%	732	0.6%
Work at Home	12,250	10.1%	11,127	8.8%

Source: U.S. Bureau of the Census

3.5 Future Transit System Development

Voters in Sonoma and Marin Counties passed a regional sales tax measure in November 2008 to provide funding for a 70 mile passenger train route along the existing Northwestern Pacific rail corridor from Cloverdale in Sonoma County to Larkspur. Sonoma Marin Area Rail Transit (SMART) is planning the construction of 14 rail stations with 5 stations in Marin: Novato North, Novato South, Marin Civic Center, Downtown San Rafael and the southern station in Larkspur connecting to the Larkspur Ferry Terminal. The proposed project also include a bicycle/pedestrian pathway generally adjacent to to the rail corridor. Passenger service is expected to begin in 2014.

4.0 TRAVEL DEMAND MANAGEMENT

4.1 Purpose and Intent of Legislation

California Government Code section 65089(b)(3) requires that a Travel Demand Management (TDM) element be a part of every CMP. Assembly Bill 2419, which became effective January 1, 1997, eliminated the requirement for a "trip reduction" component to this element, leaving only the "travel demand" component. According to the revised CMP legislation, the TDM element should promote:

- Alternatives to the single-occupant automobile, e.g., carpools, vanpools, transit, and bicycles
- Increased use of park-and-ride lots
- Improvements in the balance between jobs and housing
- Other strategies for reducing vehicle trips, including flexible work hours, telecommuting, and parking management programs

The agency must also consider parking cash-out programs during the development and update of the travel-demand element.

Responsibility for planning future land use and zoning patterns and for reviewing proposed development plans rests with local government. Both long-range planning and development-review phases of local planning offer local governments' opportunities to ensure that TDM measures are implemented. Although not required, local governments may choose to support (by resolution or other means) regional TDM measures, such as carpool lanes and ridesharing facilities that could be implemented by other agencies (e.g., Caltrans).

In the long-term, peak-period travel speeds are forecast to deteriorate on segments of U.S. 101, especially where no capacity increases are likely. Along with adding highway capacity and improving local transit service in response to this growing traffic, it is also important to improve the operating efficiency of the existing transportation system through TDM measures. The TDM element of the CMP encourages an on-going process that promotes local and regional planning to reduce traffic congestion.

4.2 Travel Demand Management in Marin County

The intent of this element is to summarize the widest possible range of choices to the County and its eleven cities in implementing the overall goal of reduced peak-hour usage of single-occupant vehicles. The TDM measures proposed fall into four broad categories:

- **Traffic operation improvements** that improve traffic flow. These improvements could come through such diverse sources as increased ridesharing or minor modifications to the highway system.
- **Transit improvements** that attract more riders to transit systems.

- **Traffic mitigation measures** that are intended to reduce traffic generated by a development or planning area and are applied through employers or developers.
- **Land-use planning and regulation** that seek to limit demand for transportation or to mandate implementation of traffic mitigation techniques through the land-use planning or approval processes.

These classifications overlap to some extent. For example, development permit approval may require traffic mitigation measures, and traffic mitigation may include greater use of public transit. The classification system focuses primarily on the entity responsible for implementation.

In general, traffic operational improvements are implemented by state and local highway departments; transit improvements are sponsored by transit agencies; traffic mitigation measures are implemented by employers or developers; and planning and regulatory techniques fall under the jurisdiction of local planning agencies. Effective traffic mitigation requires coordinated and systematic action by both the public and the private sectors.

The Transportation Authority of Marin has significantly expanded its TDM efforts over the last two years. A Vanpool Incentive Program has been established, coincident with the opening of the Highway 101 Gap Closure, with substantial financial support from the Bay Area Air Quality Management District's Transportation Funds for Clean Air (TFCA). An Emergency Ride Home program is currently being developed to assure carpoolers and vanpoolers have a ride home from their workplaces in an emergency. A SchoolPool program is being started to enable local ride-matching opportunities for parents and their children. Finally TAM continues to coordinate closely with MTC's 511.org Regional Ride Share resources, that continue to provide quality services to employers and employees on rideshare opportunities.

4.3 Consistency with Pertinent Air Quality Plans, as Incorporated in the RTP

The Bay Area's Regional Transportation Plan (RTP) incorporates Transportation Control Measures (TCMs) contained in federal and state air quality plans to achieve and maintain standards for ozone and carbon monoxide. The statutes require that the Capital Improvement Program (CIP) of the CMP conform to transportation-related vehicle emission air quality mitigation measures. CMPs should promote the region's adopted TCMs for the federal and state clean air plans.

The Marin CMP includes numerous project types and programs that are identified in the TCM plan. Table 19 lists chapters of the Marin CMP that address specific TCMs. Currently, there are no unmet TCMs in the Bay Area's implementation plans for air quality.

The Bay Area Air Quality Management District has released updated draft TCMs in June, 2009. The new TCMs are to be finalized in December, 2009. These are refined from prior TCMs to better define the actions, as well as expanded to include green house gas emission mitigation actions. Future versions of this CMP chapter will be updated to reflect changes to the new TCMSs once they are adopted.

TABLE 19. CORRELATION OF BAY AREA CLEAN AIR PLAN TCMS WITH CMP

TCM*	Description	Where Addressed in CMP
S1, F9	Support voluntary employer-based trip reduction programs.	Chapter 4, Travel Demand Management
S3, F3	Improve area-wide transit service.	Chapter 7, Capital Improvement Program
S5	Improve access to ferries.	Chapter 7, Capital Improvement Program
S7	Improve ferry service.	Chapter 7, Capital Improvement Program
S8, F4, F20	Construct carpool/express bus lanes on freeways.	Chapter 7, Capital Improvement Program
S9	Improve bicycle signage, access and facilities.	Chapter 7, Capital Improvement Program
S10	Youth transportation.	Chapter 3, Performance Measures Element
S12	Improve arterial traffic management.	Chapter 7, Capital Improvement Program
S13, F21, F22	Transit use incentives.	Chapter 7, Capital Improvement Program
S14, F5	Improve rideshare/vanpool services and incentives.	Chapter 4, Travel Demand Management
S15	Local clean air plans, policies and programs.	Chapter 5, Land Use Analysis Program
S19	Pedestrian travel.	Chapter 7, Capital Improvement Program
S20	Promote traffic calming measures.	Chapter 7, Capital Improvement Program
F7, F8	Develop park-and-ride lots.	Chapter 7, Capital Improvement Program
F24, F25	Maintain and expand signal timing.	Chapter 7, Capital Improvement Program

Source: Bay Area Air Quality Management District

4.4 Additional Transportation Demand Management Activity

4.4.1 TPLUS Pedestrian and Transit-Oriented Design Toolkit

In May 2007, the Transportation Authority of Marin distributed the TPLUS Pedestrian and Transit-Oriented Design Toolkit. This document contains a number of development strategies which can be applied to achieve trip reduction. These include concepts on land use (density, intensity and mixed-use), urban design (site plans, building orientation and parking), improved connectivity (for local traffic, bicycles, pedestrian and transit), traffic management (traffic calming), street design (including paved roadways, sidewalks, landscaping and transit facilities), specific mobility needs for seniors and persons with disabilities, access to schools (transit, bicycle and pedestrian), educational programs, and parking guidance. The report contains "best practices" concepts that are most appropriate for application in Marin County. Since its development, TAM staff has begun to work with Marin County jurisdictions and Toolkit concepts are being considered as station area planning and pedestrian-oriented projects begin in the County.

4.4.2 Supporting Climate Change and TDM

In its role as the Congestion Management Agency, TAM seeks opportunities for achieving congestion relief. These include highway improvements, such as the carpool lane on highway 101; providing transit through the commitment of the ½ cent local sales tax for transportation; and supporting investments in bicycle and pedestrian facility improvements, such as the Puerto Suello Hill/Lincoln Multi-use path and the Cal-Park Hill Tunnel facility. In its role as the Congestion Management Agency, TAM can look to other opportunities for congestion relief which serve to meet air quality goals. These can include the following:

- **Coordinate and/or support** grant opportunities for alternative fuel development or electric vehicle purchase and its associated infrastructure,
- **Work to develop** cooperative land use policies that provide opportunities for congestion relief,
- **Coordinate bicycle/pedestrian facility development** in Marin County that crosses local jurisdictional boundaries to achieve a greater benefit than a single jurisdictional facility may provide, and
- **Expand coordination opportunities** with employers and employees to rideshare, telecommute, or other options to driving alone.

These efforts not only reduce VMT but reduce greenhouse gas emissions from auto travel. This builds Marin County's initial response to SB 375, which requires that greenhouse gas emissions be curtailed across California. The implementation requirements are in their initial stages of development, and enhancements and processes will be adopted sometime in 2009 and 2010 to better define the role of the Congestion Management Agencies in this new initiative.

4.4.3 School Rideshare Outreach

TAM anticipates further decrease in school-related auto trips with continued implementation of the SchoolPool and other campaigns under the Safe Routes To Schools program. In addition, TAM and its consultants are developing of a GIS-oriented website to connect interested rideshare/carpool participants – with focus on linking both students and commuters with common destinations.

5.0 LAND USE ANALYSIS

5.1 Purpose and Intent of Legislation

California Government Code Section 65089(b)(4) requires that a CMP contain a program to analyze the impacts of land-use decisions made by local jurisdictions on the regional transportation system (both highways and transit).

The Land-Use Analysis Program must include an estimate of the costs to mitigate impacts of development on the highway and transit systems. The legislation allows the cost of mitigating interregional travel (trips that do not begin in Marin County or trips that travel entirely through Marin County) to be excluded from the mitigation cost estimate. Public and private (developer) contributions to regional transportation improvements may be credited.

The law does not change the role of local jurisdictions in making land-use decisions and in determining the responsibilities of project proponents to mitigate those impacts. However, TAM has the authority to withhold gas tax subventions to local governments provided by Proposition 111 if a local jurisdiction fails to meet the requirements outlined in the Monitoring and Conformance chapter of the CMP (Chapter 8). Further guidance on the Land-Use Analysis Program is found in the *Congestion Management Resource Handbook* (Caltrans, November 1990, pages 35-37).

The Land-Use Analysis Program is particularly important because it affects, or is affected by:

- The CMP Designated Transportation System and Roadway Level of Service Standards (see Chapters 1 and 2),
- Performance Measures (see Chapter 3),
- The Marin Travel Model, which is capable of analyzing land-use impacts on both highways and transit (see Chapter 6), and
- The Capital Improvement Program (see Chapter 7).

The intent of the Land-Use Analysis Program is to improve the linkage between local land-use decisions and regional transportation facility decisions; to better assess the impacts of development in one community on another; and to promote information sharing between local governments when the decisions made by one jurisdiction have an impact on another.

The Land-Use Analysis Program for the Marin CMP is a process designed to improve upon decisions about land-use and the spending of funds on highway and transit improvements in the county. The process is intended to work in a positive, cooperative fashion that supports the needs of local, county, regional and state governments.

TAM acts as a resource to local governments in performing transportation analyses of land use changes on the CMP designated transportation network. The Marin Travel Model is used to analyze local general plan updates and amendments and other major development decisions. The

California Environmental Quality Act (CEQA) provides a framework for such assessment. To avoid duplication, the Land-Use Analysis Program is intended to make maximum use of the CEQA process.

Cities can develop and maintain their own transportation models for use in local forecasting or impact analysis. However, their models should be approved by TAM for consistency with countywide and regional transportation models. No cities in Marin have their own multi-modal model for local forecasting.

5.2 Land Development Projects Subject to Analysis

Marin County maintains an inventory of proposed development projects, known as "PROPDEV." PROPDEV includes all projects with at least five residential units or at least 5,000 square feet of non-residential use. The PROPDEV database file covers 40 items of information including location, project sponsor, acreage, zoning, square feet of building area, and status of development application.

Projects at the low end of the PROPDEV threshold are generally too small to effectively analyze using the Marin Travel Model. Large projects requiring a city or county general plan update or amendment should, however, be analyzed using the model. This approach is particularly attractive for four principal reasons:

1. General plan updates and amendments are normally processed well before any construction takes place. This provides more time for transportation impacts to be analyzed and mitigation measures developed than would occur if the analysis took place closer to actual project construction.
2. Existing general plans have already been incorporated into the Year 2035 land-uses for the countywide model, as well as for the MTC regional travel model. Thus, any land development project that conforms to the general plan should not materially alter the forecast results generated by computer analysis already completed for the CMP. Only *changes* in (or amendments to) existing general plans could cause significant change in the Year 2035 model forecasts.
3. A city or the county may consider general plan updates or amendments no more than four times during any year according to state law. This reduces the possible model runs that would be required.
4. Most (but not all) general plan updates or amendments are for developments of significant size.

5.3 The Land-Use Analysis Program: Analysis Tier Method

A two-tiered information and analysis process of local land-use impacts is established by the Marin CMP. Under "Tier I," local governments forward information on proposed general plan updates or amendments to TAM during the period when the local jurisdiction is reviewing the application. "Tier II" includes a biennial update of projected land uses for 10 years in the future to be used for modeling both traffic and transit impacts. This two-tiered approach is discussed in more detail below.

5.3.1 Tier I

For Tier I, local governments forward information to TAM for any general plan updates or amendments concurrent with the local governments' approval process. By analyzing general plan updates or amendments rather than specific projects permitted under existing general plans, cities can proactively take into account regional transportation impacts and provide ways to finance transportation costs in advance of development proposals. Every application for a general plan update or amendment or major development proposal that would generate a net increase or decrease of 100 vehicle trips during the P.M. (afternoon) peak hour is to be forwarded to TAM for analysis. Local jurisdictions are responsible for determining which projects meet these criteria. The P.M. peak hour is most appropriate because for most roadway segments, traffic levels of service are worse during the P.M. peak hour than in the A.M. peak hour. Examples of projects that typically meet the 100-trip threshold include 100 single-family homes, 150 apartment units, 5,000 square feet of retail space, or 40,000 square feet of office space.

5.3.2 Tier II

Local jurisdictions are still responsible for reporting information for projects in the PROPDEV inventory. This inventory has a significantly lower threshold for all uses except retail space. Small projects in PROPDEV below the 100-trip threshold do not warrant a run of TAM's transportation model. Only large development proposals requiring general plan updates or amendments create a significant difference in the previously forecast Year 2035 travel demand. Future levels of service are based on the land use assumptions and corresponding travel demand forecasts based on current general plans. The information on each general plan update or amendments that should be forwarded to TAM includes:

- Precise location of the project(s), mapped, including street access location;
- Project land use(s) and number of dwelling units or square footage of development;
- Any available traffic studies, including trip generation rates assumed in determining whether the general plan update or amendment met the 100-trip threshold; and
- Expected occupancy of each land-use in Year 2035, with completion date and phasing.[5]

5 General Plans normally focus on build-out conditions. Since CMPs focus on a 7-Year CIP and a 7-10 year transportation modeling horizon, it is critical that the timing of development, in the general plan update or amendment, be addressed.

The TAM model run is to be incorporated into the local development review process. The local jurisdiction is responsible for identifying mitigations and costs as part of the Negative Declaration or Environmental Impact Report for the project. The local jurisdiction sends the environmental document to TAM for referral and comment. TAM provides data on the number and percentage of interregional trips on facilities for which mitigations have been recommended.

Following approval of the general plan update or amendment or qualifying major development proposal, the local jurisdiction sends final project information and documentation to TAM so that TAM can conduct "Tier II" of the Land-Use Analysis Program.

TAM biennially runs the countywide computer model on the updated land-use and transportation network information provided by the planning departments of each local government in Marin County. This analysis has been based on all general plan updates or amendments received during the past year, as well as an assessment of the actual amount of development likely in the future based on PROPDEV's listing of "Approved" projects. Local governments are also responsible for advising TAM of all changes to the highway network and transit system based on their knowledge of developer mitigations, ordinance approvals, or changes to the circulation element of their general plan.

5.3.3 Tier I and Tier II Compliance

In order to comply with the requirements of Tier I and Tier II of the Land-Use Analysis Program, all jurisdictions in the county need to:

1. Biennially (in accordance with the County PROPDEV update schedule):

- Submit a complete account of all residential and commercial projects approved during the preceding year, and
- Continue to participate in the County's PROPDEV inventory.

2. During CEQA scoping process, submit information on all general plan updates and amendments and major project proposals involving a net change (increase or decrease) of 100 or more P.M. peak-hour vehicle trips.

3. As appropriate:

- Submit information on all highway network and transit system changes in their jurisdiction that result from: (1) project mitigations, (2) ordinance approvals, or (3) changes to the circulation element of their general plan.
- Adopt traffic LOS standards that are consistent with or more restrictive than the LOS standards in the CMP.
- Develop a multi-year Capital Improvement Program designed to meet the adopted LOS standards and support alternate modes of transportation.
- Consider adoption of local and regional development traffic mitigation fee programs consistent with requirements and intent of the CMP legislation. Low- and very low-income

housing should specifically be exempt from mitigation fees. Development should be assessed only their fair-share of improvements to regional facilities.

- Comply with monitoring and conformance requirements as outlined in Chapter 8.

5.3.4 Example of the Process

The following are hypothetical examples provided to show how this process works:

1. Based upon the jurisdictions' land-use data provided to TAM under Tier II and the proposed Capital Improvement Program, a run of the Marin Traffic Model indicates that there would be no further reductions in level of service below the standards adopted in the CMP. In that case, local jurisdictions would be free to make any land-use changes or approvals without CMP analysis, provided that whatever decisions they make are consistent with the information that has been provided to TAM.

2. At some time in the future, a local government decides that it wishes to amend its general plan to allow for a new development to occur on 100 acres of land that had formerly been included in the Tier II land-use information. This area had been formerly zoned for agriculture but is proposed under the general plan amendment for single-family homes at six units per acre. These 600 proposed units would generate more than the threshold of 100 net new P.M. peak-hour trips, so the local government planning director, public works director, or traffic engineer forwards all of the general plan amendment application materials to TAM. Because of the size of the project, the local government also decides to hire (or have the applicant hire) a traffic engineer to prepare a detailed, comprehensive study of the proposed general plan amendment.

Under Tier I review, TAM would make modifications to its land-use database used in the Marin Travel Model. The model would be run, including all highway and transit improvements (not just those on CMP designated facilities) for which funds seem reasonably secure, and also any improvements the applicant is willing to pay for as a condition of development approval. Assume that the model run indicates that some arterial segments of the CMP designated roadway system would operate worse than the LOS D standard as a result of general plan amendment approval.

TAM would forward this information to the local agency, which would consider the reduction in level of service in making their decision to approve or not to approve the general plan amendment. In developing conditions for project approval, the local jurisdiction would then have the option of:

- Requiring additional mitigations from the developer, such as TDM measures (e.g., transit service, flex time, etc.), roadway improvements that would improve the LOS to the adopted standard, or other system improvements that would improve air quality as allowed by the CMP legislation.

- Delaying the project until a certain highway or transit project is constructed.

- Working closely with the TAM staff on development of a Deficiency Plan if it appears that a CMP system segment does not meet the adopted LOS standard.

- Choosing not to implement any of the above measures and risk having the LOS not meet the adopted standard on certain roadway segments. In this case, the local government would risk losing the increment of gasoline taxes provided by Proposition 111.

5.4 Relationship of the Land-Use Analysis Program to CEQA

Local governments continue to have lead agency responsibility for performing Environmental Impact Reports and Negative Declarations and conducting transportation analyses as part of these documents. Local government should continue to propose and analyze mitigation strategies. TAM may comment through the CEQA process, keeping local governments informed as to the adequacy of the analysis and approving any transportation models that are used for the analysis. TAM may also provide local governments with information on cumulative impacts.

5.5 Congestion Management Agency Experience with the Process

TAM (and previously the Countywide Planning Agency) has reviewed several land-use plans and projects since adoption of the first CMP in 1991. These reviews have demonstrated that the Land-Use Analysis Program as described above has generally been successful.

Marin County staff routinely maintains a land use inventory including a file of proposed development. The staff last undertook a comprehensive land use inventory update in 2007. This update includes all land uses in Marin County, including these constructed since the beginning of the CMP in 1991.

In the future, if any Marin County jurisdiction does not meet each of these CMP requirements by December 2009 when the CMA makes its non-conformance determination for each jurisdiction, that jurisdiction is found in non-conformance and may risk:

- Losing an increment in its gasoline tax subvention funds
- Not having projects programmed in the Regional Transportation Improvement Program (RTIP)

A more formalized tracking and compliance process is currently being discussed with local jurisdictions. The role of the Marin CMA and new requirements to reduce state greenhouse gas emissions is part of this discussion. Failure to participate in this new process may result in a finding of non-compliance for a local jurisdiction.

6.0 TRAVEL FORECAST MODEL

6.1 Purpose and Intent of Legislation

California Government Code Section 65089(c) requires that every CMA, in consultation with the regional transportation planning agency (MTC), cities, and the county, develop a uniform database on traffic impacts for use in a countywide travel demand model. It also requires that the countywide model be the basis for transportation models used for county sub-areas and cities, and that all models be consistent with the modeling methodology and databases used by the regional transportation planning agency. The CMA also approves sub-county area transportation models, and models used by local jurisdictions for land-use impact analysis, if local jurisdictions decide to perform this work on their own.

The purpose of this requirement is to guide the CMA decision making process in identifying the most effective balance of transportation programs and projects that maintain LOS standards. The purpose includes consideration of the benefits of transit service and TDM programs, as well as the need for projects that improve congestion on the CMP designated network. The modeling requirement is also intended to assist local agencies in assessing the impact of new development on the transportation system.

6.2 Local Agency Requirements

At this time, there are no specific requirements of local agencies, other than supplying the base year land-use information that is noted in the land-use analysis chapter (Chapter 5). TAM expects to continue to operate its own countywide model, although cities may also create and use their own model, subject to the legislative requirements above.

TAM staff continually refines and updates the Marin Travel Model. This includes meeting with MTC regularly to review model consistency procedures and participating in the regional Modeling Coordination Subcommittee of the Bay Area Partnership. It also includes periodically reviewing network and land- use assumptions for base and future years for every model run performed for the Land-Use Analysis Program.

6.3 Travel Demand Forecast Overview

A distinct and measurable relationship between travel demand, land-use patterns, and transportation systems is the basis for modern transportation planning practice. Transportation models have been developed as the best tools available to quantify this, but the relationship is complex, and research on more effective transportation modeling is still evolving.

CMP legislation requires consistency with the regional travel model. This section of the CMP summarizes the Marin Travel Model (hereinafter referred to as MTM) performance and its consistency with the MTC Travel Demand Model guidelines for CMPs.

6.4 Existing and Past Programs

Bay Area modeling has been characterized by extensive travel behavior studies and model development by the Metropolitan Transportation Commission (MTC), the recognized Metropolitan Planning Organization for the Bay Area. MTC has had the charge and the funding at the federal level to develop models of travel behavior since the early 1970's. Marin County, in developing its own travel demand model, has built on information and logic from the MTC model.

MTC is required to review any sub-regional model for consistency with the MTC model. TAM staff assists with any revisions to the model. The remainder of this chapter contains the MTC checklist and responses for model consistency. Items from the MTC checklist are provided in boxed quotes in Section 6.5 below.

MTC's goal is to establish a regionally consistent model "set" for application by MTC and the Bay Area CMAs. The Bay Area Partnership finalized a report on modeling consistency issues which recommended that MTC develop and the CMAs incorporate a consistent set of model components on desktop computers (termed BAYCAST). For immediate use for this CMP, the study recommended that the current MTC checklist format be used, with specific tolerances. This revised MTC checklist incorporates results of testing those tolerances, as well as additional analyses. Perhaps most important to TAM, the report found that, "…the Marin and San Mateo CMA model systems are the closest to the MTC model system. They use the same trip generation, mode split and assignment algorithms." Differences have been cited in Marin's use of "…finer network and zonal detail…" and "…locally calibrated friction factor curves…" and the need to use its "…own equations to derive additional demographic detail not provided in …ABAG forecasts." But these differences did not detract from the consistency assessment.

Land use forecasts for Marin County jurisdictions have been updated to ABAG's *Projections 2007*. In such measures as households, population, jobs and employed residents, the changes are one percent or less, well within the criteria applied by MTC to determine model consistency. Thus, Marin will fall within the model consistency checklist. A separate letter demonstrating this finding includes additional information regarding the negligible differences between MTC's model and Marin Travel Model (MTM).

6.5 MTC Modeling Consistency

MTC require local CMAs to submit a checklist for model consistency. This Checklist guides Congestion Management Agencies through their model development and consistency review process by providing an inventory of specific products to be developed and submitted to MTC, and by describing standard practices and assumptions to be followed. The Checklist items are highlighted in the green boxes in this chapter.

Because of the complexity of the topic, the MTC checklist may need additional detailed information to explain differences in methodological approach or data. If significant differences occur, they would need to be resolved between MTC and the CMA, taking advantage of The Partnership's Modeling Coordination Working Group standard formats for model comparisons that

have been developed. In the case of the MTM, no difference in data occurs that requires resolution.

6.5.1 Incremental Updates

Congestion Management Agency forecasts must be updated every two years to be consistent with MTC's forecasts. Alternative approaches to fully rerunning the entire model are available, including incremental approaches through the application of factors to demographic inputs or to trip tables. Similarly, the horizon year must be the same as the TIP horizon year; however, interpolation and extrapolation approaches are acceptable, with appropriate attention to network changes. These alternatives to full re-running of the model should be reviewed with MTC. The MTM is routinely updated to reflect new development and transportation projects within Marin County. The MTM conforms to the MTC consistency guidelines.

6.5.2 Defining the MTC Model Sets

> **Requirement:** Unless otherwise specified, the MTC model sets referred to below will be defined as those in use on October 1st of the year preceding the CMP update.

The model data sets used by MTC in early 2009 have been those associated with the Super District and County Summary of ABAG's *Projections 2007*. In addition, most major projects are included in both MTC and MTM travel models.

6.5.2.1 APPROACH TO TRAVEL DEMAND MODELING IN MARIN COUNTY

> **Requirement:** Describe the model, and its relationship to the MTC model. If the model is based on MTC's model, describe any adjustments to model constants, coefficients, k-factor or friction factor re-estimation, market segmentation, trip purposes, etc.

TAM operates and updates its own countywide travel demand model using information and logic from the MTC model. For the CMP, the Marin Travel Model (MTM) contains 117 traffic analysis zones (TAZs) within the county, 83 TAZs for San Francisco, 69 TAZs for Sonoma, and 24 TAZs corresponding with MTC "super-districts" for other Bay Area counties. Each of these zones and districts is connected to the others with a network of road and transit lines. Travel models use specialized software to predict P.M. and A.M. peak hour travel between these zones, and estimate Average Daily Traffic.

The MTM is a "focused" model, meaning that the network contains different structures inside and outside the focus area. The inside or focused counties for the MTM are San Francisco, Marin, and Sonoma Counties. Other Bay Area counties are outside the focused area. The primary difference

is that the more detailed MTC network structure is included in focused areas, while a skeleton roadway network is structured outside. Because the network outside the focused areas is reduced, the speeds on the skeleton roadway network are fixed (not variable depending on capacity). Therefore, traffic volumes do not represent actual traffic volumes on these "unfocused" roadway links.

To further ensure regional consistency, the MTM uses a technique referred to as "balancing." This is done to guarantee that trip-end estimates and forecasts and trip flows between counties are roughly equal, whether provided by the MTC regional model or the MTM.

The MTM mode-choice procedure occurs after the person-trip generation and trip-distribution steps. It includes a detailed mode-choice analysis that predicts transit-person trips, 2-person vehicle-person trips, 3+ person vehicle-person trips, or drive alone vehicle-person trips for home-based-work trips. Simpler formulas are used to predict all other trip purposes and modes, including home-based shopping trips, home-based social-recreational trips, home-based school trips, and non-home-based trips as well as walk and bicycle trips.

6.5.2.2 DEMOGRAPHIC/ECONOMIC/LAND-USE FORECASTS

Requirement: Use exact Association of Bay Area Governments (ABAG) Projections 2005 data for other Bay Area counties, and control totals (within one percent) for the county for population, households, jobs, and employed residents. Congestion Management Agencies may reallocate growth forecasts within their own county in consultation with cities, MTC, and ABAG. The latest set of ABAG's Projections must be used for all new demographic databases developed for baseline travel demand forecasting purposes after August 1 of the year preceding the CMP update. Future year forecasts should address the latest available ABAG Projection series. MTC, in consultation with the Modeling Coordination Working Group, will develop factors that may be used to achieve consistency with the most recent ABAG demographics. Congestion Management Agencies may also, of course, analyze alternative land-use scenarios in addition to these forecasts. If a land use based model is utilized, production and attraction comparisons will be made with the MTC model.

The MTM has been updated to be based on ABAG *Projections 2007* land use data. Land use data is sometimes unavailable from local jurisdictions, forcing estimates based on past data or overall growth in the area. This requires TAM to adjust its input as better data is acquired. As TAM has recognized inconsistencies in land uses by census tract it has made minor corresponding adjustments. The overall land-use attributes for Marin County as a whole are consistent with ABAG. The difference between the MTM and ABAG *Projections 2007* is one percent or less for all the land-use categories. Land-use data outside of Marin is based on MTC *Projections 2007*land use assumptions.

Future-year allocations by census tract provided by ABAG have been similarly refined. For this reason, individual census tracts do not contain land-use attributes identical to ABAG *Projections 2003*, but the overall county total for 2035 is consistent with ABAG.

6.5.2.3 PRICING ASSUMPTIONS

> **Requirement:** Use MTC's auto operating costs, transit fares, and bridge tolls.

The MTM has made adjustments for these regional pricing assumptions which are consistent with MTC requirements:

- **Bridge Tolls.** This assumes the $5.00 Golden Gate Bridge toll and $4.00 Richmond-San Rafael Bridge toll, adjusted to 1979 dollars. These tolls reflect the 2007 amounts.
- **Auto Parking Costs.** Auto parking costs have been adjusted to the 1979 cost of living index as published by MTC. No other auto parking costs are assumed in the focused area.
- **Auto Operating Costs.** An auto operating cost of 13.12 cents per mile is adjusted as needed to conform with the MTC guidance (which is defined in 1979 dollars).

6.5.2.4 NETWORK ASSUMPTIONS

> **Requirement:** Use MTC's regional highway and transit network assumptions for other Bay Area counties. Congestion Management Agencies should include more detailed network definition relevant to their own county in addition to the regional highway and transit networks. For the CMP horizon year, to be compared with the TIP interim year, regionally significant network changes in the base case scenario shall be limited to the current Transportation Improvement Program (TIP) for projects subject to inclusion in the TIP.

The MTM was first developed in 1987 and was revalidated for 2005. The MTM uses the MTC model structure facility types and numbers of lanes for Marin County. Some additional detail in the roadway network has been added where appropriate within Marin County. The MTM includes representations of these major roadway gateways into and out of Marin County:

- Highway 101 – (Golden Gate Bridge) San Francisco
- Interstate 580 – (Richmond/San Rafael Bridge) Contra Costa County
- Highway 37 – Sonoma County
- Highway 101 – Sonoma County
- Highway 1 – Sonoma County

In addition, ferry connections from Larkspur, Tiburon, and Sausalito to San Francisco are also assumed in the MTM. Finally, the Sonoma-Marin Area Rail Transit (SMART) project is now included in the future year model networks after 2014. Because this is a focused model, the East Bay and South Bay highway network are much less detailed than in the MTC model. A skeleton network in these locations significantly reduces run time for the model, and enables the model to be small enough to be operated on desktop computers. The impact of this network reduction is considered negligible to congestion in Marin County.

6.5.2.5 AUTO OWNERSHIP ASSUMPTIONS

> **Requirement:** Use MTC auto-ownership models or forecasts, or submits alternative models to MTC for review and comment.

The MTM uses MTC and ABAG information on auto ownership to establish mode split.

6.5.2.6 TRIP GENERATION

> **Requirement:** Use the BAYCAST person trip generation models for home-based work and non-work, and non-home based trips, or submit alternative models to MTC for review and comment. Results may be adjusted sub-regionally through calibration or modal constant adjustments.

The MTM uses household size and income quartile cross-classification modeling. The MTM then revises the results using adjustment factors designed to replicate actual MTC trip generation patterns between counties into the model. In this way, aggregate trip generation by county is also consistent with the MTC model. The difference in trip productions or attractions (by type of trip) between the MTM and MTC model is never greater than 1 percent.

6.5.2.7 TRIP DISTRIBUTION

> **Requirement:** Work trip distribution models must be calibrated to the 2000 Census Journey-to-Work commuter matrices. Trip distribution results must be balanced to productions, and attraction-balancing problems should be discussed with MTC.

The MTM uses MTC trip distribution patterns between counties. In this way, aggregate trip distribution by county is completely consistent with the MTC model. With this technique, the MTM has achieved a closer trip distribution match with the MTC model than is normally expected with a focused model structure. The difference between the two models is less than one percent for all trips projected for the 2005 and 2035 model years.

6.5.2.8 MODE CHOICE

> **Requirement:** If a logit mode choice model is to be used, MTC's BAYCAST should be used, or submit alternative methodology for MTC review.

The MTM mode choice analysis is consistent with MTC methodology. For home-based work trips, the MTM contains a Home-Based Work Mode Choice Model that predicts work trips, dividing them into drive alone, 2-person, 3+ person and transit trips. Non-work trips are assigned to auto and transit with auto occupancies inputted at this stage.

6.5.2.9 TRAFFIC ASSIGNMENT

> **Requirement:** Use capacity restraint assignment for peak-hour (or period) traffic assignments, or submit alternative methodology for MTC review.

The MTM provides A.M. peak, P.M. peak, non-peak, Average Daily Traffic, traffic and transit assignments similar to MTC's methodology, with the same A.M. and P.M. time-of-day properties the MTC uses.

6.6 Relationship to the Capital Improvement Program

The 2035 model run for the MTM includes all relevant projects listed in the State Transportation Improvement Program. These projects are incorporated into the 2035 base network in the MTM.

The MTM is used for assessing the impacts of capital improvements. CMP statutes stipulate three criteria for projects selected for the Capital Improvement Program (CIP):

- Projects must maintain or improve the traffic level-of-service and transit performance standards,
- Project land-use impacts must be mitigated, and
- Projects must conform to vehicle emissions and air quality mitigation measures.

Toward that end, the model results are typically used in evaluating relevant projects in the CIP chapter (Chapter 7), in preparing a project list for Regional Transportation Improvement Program consideration and for development and programming of any supplementary sources of revenue.

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7.0 CAPITAL IMPROVEMENT PROGRAM (CIP)

7.1 Purpose and Intent of Legislation

California Government Code section 65089(b)(5) requires that a CMP contain a 7-year Capital Improvement Program (CIP) to maintain or improve the performance of the multimodal system for the movement of people and goods and to mitigate regional transportation impacts identified through the Land-Use Analysis Program. Capital improvement projects must conform to transportation-related vehicle emissions and air quality mitigation measures. These transportation control measures (TCMs) are contained in the *Bay Area 2000 Clean Air Plan*.

7.2 Relationship to the Regional Transportation Plan (RTP)

Since the CMP is ultimately incorporated into the *Regional Transportation Plan* (RTP) Action Elements, projects for this CIP should be consistent with the assumptions, goals, policies, actions and projects identified in the RTP. The RTP is the basic statement of transportation policy expressed by MTC. Because of the interdependence of transportation planning and land-use planning, a major effort was made by MTC to adopt policies that complement and support programs of federal, state, and regional agencies.

MTC adopted their current RTP in 2008.

7.3 Relationship to the Regional Transportation Improvement Program (RTIP)

The CIP is the basis for determining which projects are included in the Regional Transportation Improvement Program (RTIP). Inclusion of a project in the RTIP is the first step in obtaining a funding commitment from the State. Projects that MTC includes in the RTIP are then recommended to the California Transportation Commission (CTC) for inclusion in the State Transportation Improvement Program (STIP). If the CTC includes a project in the STIP, it has approved the project for the necessary environmental studies and project design, which ultimately lead to a final decision on whether or not to build the project.

Projects that are to be included in the RTIP must be first included in the County's CIP. However, it is important to note that MTC is responsible for assembling the RTIP and that the RTIP is a funding-constrained document. This CIP is developed with information from the current RTIP, which was adopted in May 2008 and has been amended as recently as November 2008.

7.4 Relationship to Air Quality Attainment Plans

The CIP projects must show consistency to air quality attainment plans. The *Bay Area 2000 Clean Air Plan* (with a subsequent amendment for Ozone in 2005) is the current adopted plan. A variety of Transportation Control Measures (TCMs) have been adopted as a part of this plan. MTC gives priority to the proposed projects that support or help implement any of the TCMs (see TDM Chapter 4 for more discussion on TCMs). Examples of such projects include high occupancy vehicle (HOV) lanes and ramp meter bypass lanes for HOVs.

7.5 Relationship to Transportation Authority of Marin Strategic Plan

The passage of Measure A in 2004 has resulted in the development of a Strategic Plan for Measure A Program. This plan is routinely updated to reflect current agency strategies. As many projects are also funded partially through Measure A revenues, the relationship of the Capital Improvements Program to this Strategic Plan is important.

The Strategic Plan discusses strategies in four areas. Each area and strategies which involve capital improvements are discussed below:

- **Strategy 1:** Develop a seamless local bus transit system that improves mobility and serves community needs including special transit for seniors and the disabled (paratransit services). This strategy includes transit capital investments.
- **Strategy 2:** Fully fund and ensure the accelerated completion of the Highway 101 Carpool Lane Gap Closure Project through San Rafael. This strategy is a capital improvement project currently under construction.
- **Strategy 3:** Maintain, improve and manage Marin County's local transportation infrastructure, including roads, bikeways, sidewalks, and pathways. This category includes capital improvements for local and regional streets, roads and paths.
- **Strategy 4:** Reduce school-related congestion and provide safer access to schools. This category includes capital projects related to safe routes and safe pathways to schools.

The Strategic Plan includes proposed allocations for each of the various categories through Fiscal Year 2024/2025. Within this plan of revenues and expenditures, key capital projects have been identified and summarized here. These are listed in Table 20.

7.6 Relationship to State Transportation Improvement Program

The State Transportation Improvement Program (STIP) lists county allocations for each of California's counties. This share for Marin includes both general program and specific project amounts. The last adopted California Transportation Commission allocations are shown in Table 21. This table, published on August 1, 2008, includes allocations to Fiscal Year 2012/13.

TABLE 20. MEASURE A STRATEGIC PLAN CIP ELEMENTS

Strategy	FY 2008/09	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16
Strategy 1								
Bus Transit Facilities	$1,308,579	$1,406,950	$1,314,947	$1,350,995	$1,111,459	$1,149,703	$1,189,094	$1,229,667
Strategy 2								
101 Gap Closure Project	$12,934,000	$2,000,000						
Strategy 3								
Novato Boulevard	$750,000	$200,000	$633,991	$2,100,000	$3,247,846			
4th Street San Rafael	$2,250,000							
Miller Avenue Mill Valley	$500,000	$350,000	$2,000,000	$2,000,000				
E. Blithedale Avenue					$470,000	$2,550,000	$1,000,000	
Sir Francis Drake				$350,000	$2,900,000	$3,600,000	$1,100,000	
Local Roads and Streets	$2,324,650	$2,177,297	$2,254,459	$2,334,067	$2,416,063	$2,500,518	$2,587,507	$2,677,106
Strategy 4								
Safe Routes to Schools	$600,000	$600,000	$600,000	$625,000	$625,000	$625,000	$625,000	$615,000
Capital Funds for Safe Pathways		$650,207		$885,992		$972,647		$1,064,581

Source: Transportation Authority of Marin, Strategic Plan, 2009

TABLE 21. STATE TRANSPORTATION IMPROVEMENT PROGRAM PROJECTS (INCLUDING CMIA PROJECTS)

Project Title	Project Description	Program Amount	FY 2008/09	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13
HOV lanes in Novato	Construct additional HOV lanes between SR 37 and Atherton Avenue	$11,210,000	$1,210,000		$10,000,000		
Central San Rafael HOV Lane Gap Closure	Construct additional HOV lanes between Lucky Drive and North San Pedro Road	$5,200,000		$2,200,000	$3,000,000		
Bus Stop Improvements	Improvements throughout County	$6,273,000		$350,000	$5,923,000		
Bicycle / Pedestrian Path Along HOV Lane Project	Construct Path as part of 101 Gap Closure HOV project						
Sonoma-Marin HOV lanes	Construction additional HOV lanes between SR 37 and the Sonoma County line	$25,990,000	$8,793,000		$17,197,000		

Source: California Transportation Commission, 2009

Note: CMIA Project – Corridor Mobility Improvement Account Projects

In addition, Marin County is a recipient of funds through the adoption of Proposition 1B in 2006. This proposition created the Corridor Mobility Improvement Account (CMIA). CMIA funds are key funding sources to help complete two major projects in Marin County. The first major project is the construction of HOV lanes between Novato and Petaluma (also known as the Marin-Sonoma Narrows project). This project is funded from many sources, with $82,400,000 in CMIA funding, completing a first phase of funding for the corridor. This project is a two-county project (not exclusively in Marin County). The second major project is $15,300,000 in CMIA funding for the widening of westbound Interstate 580 westbound to northbound US 101 connector in San Rafael; this project will ease congestion for traffic traveling from the East Bay over the Richmond-San Rafael Bridge. These are shown in Table 22.

TABLE 22. CORRIDOR MOBILITY IMPROVEMENT ACCOUNT (CMIA) PROJECTS

Project	Prior Years	FY 07/08	FY 08/09	FY 09/10	FY 10/11
HOV Lanes Novato to Petaluma					
Total Program Amount	$21,500,000	$17,200,000	$11,220,000	$13,420,000	$139,459,000
CMIA Portion					$82,400,000
Auxiliary Lane I-580 Westbound to US 101 Northbound					
Total Program Amount		$4,700,000	$15,300,000		
CMIA Portion		$4,700,000	$15,300,000		

Source: California Transportation Commission, Transportation Authority of Marin

7.7 Additional Transportation Projects

Other transportation projects are also ongoing in Marin County. Many have been recognized in the Regional Transportation Improvement Program, prepared by the Metropolitan Transportation Commission in 2008 and amended in 2009. The listing of other TIP projects are shown in Table 23.

TABLE 23. ADDITIONAL TRANSPORTATION PROJECTS

Project	Funding Sources	Amount 2009 to 2013
San Rafael Transit Center Improvements	Bridge Toll, Earmark	$265,000
TransLink Fare Collections System	CMAQ, Local	$286,000
Fixed Guideway Connectors	Transit 5307,5309, Local	$2,147,000
Ferry Major Components Rehabilitation	Transit 5307, 5309, Local, STP	$2,339,000
Replace MS Sonoma Ferry Vessel	Transit 5307, 5309, Local	$13,455,000
Ferry Channel & Berth Dredging	Transit 5307, 5309, Local	$5,658,000
Management Information System	Transit 5307, Local	$940,000
ADA Paratransit Assistance	Transit 5307, Local	$1,444,000
Larkspur Ferry Terminal Parking Improvements	Transit 1064, Local	$8,800,000
Novato Bus Stop Improvements	RIP	$6,273,000
Marin Parklands Visitor Access Improvements	Federal Lands	$180,000
Tennessee Valley Bridge	Earmark, Local	$611,000
US 101 / Greenbrae Interchange Improvements	Bridge Toll	$38,634,000
US 101 – Golden Gate Botanical Area Revegetation	ITIP	$350,000
Marin US 101 HOV Gap Closure	CMAQ, RIP	$18,580,000
US 101 HOV Lanes – Marin-Sonoma Narrows	Earmark, ITIP, Prop, RIP	$362,271,000
I-580 WB to US 101 NB Aux Lanes	Prop	$15,300,000
Cal-Park Hill Tunnel Improvements	Bridge Tolls, CMAQ	$6,272,000
Chimney Rock Lighthouse Rehabilitation	Federal Lands	$5,805,000
Central Marin Ferry Access Improvements	Bridge Toll	$8,360,000
Stinson Beach Access Road	Federal Lands	$2,688,000
E. Sir Francis Drake Wooden Bridge Rehab	XGEN	$90,000
Mill Valley – Miller Avenue Rehabilitation	BTA, Local, TDA	$4,200,000
Marin Bike/Ped Facility North of Atherton Ave	Earmark, Local	$610,000
Novato Boulevard Improvements, Diablo to Grant	Local, XTRAN	$11,898,000
San Anselmo – Non-motorized Transp. Pilot Prog.	Earmark	$255,000
Novato – Non-motorized Transp. Pilot Prog.	Earmark	$1,700,000
Ross – Non-motorized Transp. Pilot Prog.	Earmark	$170,000
Fairfax – Non-motorized Transp. Pilot Prog.	Earmark	$110,000
San Rafael Canal Street Pedestrian Access	CMAQ, Local	$381,000
San Rafael – Non-motorized Transp. Pilot Prog.	Earmark	$1,090,000
Marin County – Non-motorized Transp. Pilot Prog.	Earmark	$7,488,000
Sausalito – Non-motorized Transp. Pilot Prog.	Earmark	$484,000
Larkspur – Non-motorized Transp. Pilot Prog.	Earmark	$917,000
Marin Parklands Visitor Access, Phase 2	Federal Lands, Local	$3,900,000
Mill Valley – Non-motorized Transp. Pilot Prog.	Earmark	$836,000
Tiburon – Non-motorized Transp. Pilot Prog.	Earmark	$298,000

Source: 2006 Metropolitan Transportation Commission Regional Transportation Improvement Program, May 2008

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8.0 MONITORING, DEFICIENCY PLANS, AND CONFORMANCE

8.1 Purpose and Intent of Legislation

California Government Code sections 65089.3, 65089.4, and 65089.5 govern the conformance process. These sections require that, based on information obtained through monitoring, TAM must biennially determine whether Marin County and its cities and towns conform to the requirements of the CMP. If an agency believes that a local government is not conforming to CMP requirements, it must then hold a noticed public hearing to determine areas of nonconformance. If after the public hearing TAM still believes that the local government is not conforming to CMP requirements, it must provide written notice to the local government citing the specific instances of nonconformance. The local government then has 90 days to remedy the instances of nonconformance. If after 90 days the local government has not remedied the nonconformance instances, TAM makes a finding of nonconformance and notifies the State Controller to withhold certain gas tax subvention funds.

8.2 Local Government Conformance Requirements

The CMP legislation makes the following requirements of a conformance determination for local jurisdictions:

- Maintaining the highway LOS standards outlined in the CMP (Chapter 2).
- Participating in a program to analyze the impact of land-use decisions, including the estimate of the costs associated with mitigating these impacts. Specific requirements and recommendations are outlined in the Land-Use Analysis Program element of the CMP (Chapter 5).
- Participating in adoption and implementation of a deficiency plan when highway and roadway LOS standards are not maintained on portions of the designated system.

If either Marin County or cities and towns in the county do not meet each of these CMP requirements when the TAM is scheduled to make its nonconformance determination for each jurisdiction[6], the jurisdiction is found in nonconformance and may risk losing an increment in its gasoline tax subvention funds and not having projects programmed in the Regional Transportation Improvement Program (RTIP).

[6] "Jurisdiction" refers to the local government that has the greatest segment distance within its boundaries. Designation of a jurisdiction that has primary responsibility for the segment provides clear direction to who is responsible for preparation of deficiency plans.

8.3 Local Government Monitoring Requirements

TAM must take active steps to ensure that Marin County and each city and town in Marin County at least biennially conforms to each requirement of the CMP legislation. Monitoring must be done for several reasons:

- Congestion is projected to increase, which will waste valuable time and add to transportation costs of goods and services.
- Congestion causes energy to be wasted and contributes to worsening of air quality.
- Coordinated growth management and transportation planning is essential to minimizing both travel time and costs.

The CMP legislation specifies that jurisdictions that do not demonstrate that they conform to the requirements are to lose street and highway subvention money. Many jurisdictions use this money for maintenance of existing streets and roads so that their transportation infrastructure do not go neglected.

Outlined below is the recommended monitoring that each jurisdiction should undertake to document to TAM that it conforms to CMP requirements.

8.3.1 Maintaining the Highway Level-of-Service Standards

TAM biennially monitors level of service on segments[7] of CMP designated routes within Marin County and its jurisdictions. Where a segment falls within two or more jurisdictions, the jurisdiction responsible for the segment is the jurisdiction with the greatest segment mileage. The monitoring program occurs during the P.M. peak period (4:00 P.M. to 6:00 P.M.). The traffic counts also should be taken in the spring (April or May), with counts at fall periods acceptable when needed (September or October). Consistent with this, the 2007 CMP update include counts done in October 2006. The LOS is to be based on the counts consistent with the methods for determining LOS outlined in the highway LOS standards (Chapter 2). In general, local governments are responsible for counts on the non-state maintained, CMP designated facilities, and Caltrans is responsible for counts on the state maintained, CMP designated facilities where either of the following conditions is met:

- The "existing" run of the Marin Travel Model shows that there has been a volume-to-capacity (v/c) ratio change that places the facility within 0.05 of the cutoff between what is considered acceptable and what is considered deficient (i.e., if the v/c ratio exceeds 0.85 for principal arterial roadways, as opposed to 0.90, or 0.95 for freeways and rural expressways, as opposed to 1.00). Specific segments meeting these criteria would be determined biennially by TAM.

[7] Roadway segments are defined from interchange to interchange for freeways, and from major intersection to major intersection for non-freeway state highways (e.g., Highway 1) and principal arterial roadways (e.g., Sir Francis Drake Boulevard). These segments, along with the designated "responsible" jurisdiction, are shown in Appendix A.

- The jurisdiction has issued occupancy permits for developments that generate a total of 100 or more P.M. peak-hour trips. While the completed projects may have an impact on CMP designated facilities in adjacent jurisdictions, the need for counts on segments that extend beyond the jurisdiction's boundaries would be directed by staff from the Transportation Authority of Marin, supposed by a model run of the Marin Travel Model if necessary

To obtain more precise data, TAM supplements the Caltrans counts with counts of its own at the gateways listed in section 6.5.2.4. This data has been used in the assembly of this CMP update.

Transportation improvements or changed economic conditions may result in changes in LOS. If the LOS is determined to be A, B, or C for any year that is monitored, the monitoring frequency would then become every three years, until such time as the segment is found to operate at LOS D or worse. Any segment determined to operate at LOS D should then be monitored every year. Certain facilities that currently operate at LOS F can be grandfathered (if they operated at this level when congestion management requirements began) and thus would not be subject to monitoring requirements, as provided for in the CMP legislation. These facilities are outlined in the highway LOS standard (Chapter 2). Although not required, jurisdictions should develop, in cooperation with TAM "improvement plans" for these facilities. Improvement plans are envisioned as a description of construction plans, program options, or management techniques that a local jurisdiction intends to advocate for implementation by that jurisdiction or others (e.g., Caltrans for state facilities). If a segment that has not been grandfathered is determined by TAM to not meet the adopted LOS standards (D for principal arterial roadways; E for freeways), then that jurisdiction must:

- Immediately propose and designate funds for measures that improve the LOS to meet or be better than the adopted LOS standard which TAM would then incorporate into the CIP, or
- Create a "deficiency plan" in accordance with CMP requirements. A deficiency plan requires the local government to:
    1. Analyze the cause of the deficiency **AND** define improvements to the facility that maintain the LOS standard, **OR**
    2. Define improvements that have a measurable improvement on the transportation system's LOS or substantial air quality benefit **AND** determine the cost of the improvements.

Guidelines governing specific issues related to Deficiency Plan preparation are provided on the TAM website. No deficiency plans will be required by this CMP.

The CMA prior to TAM decided to grandfather certain roadway segments currently operating at LOS F according to specified criteria, and to recommend preparation of improvement plans for the grandfathered roadway segments. This exempts certain freeway and arterial segments from the congestion management requirements where TAM cannot identify viable transportation improvements for improving the operation of the deficient segment to meet the adopted LOS standard.

8.3.2 Maintaining Performance Measures

Performance measures have been required by the CMP legislation. The eight performance measures that are currently analyzed are:

- Roadway Level-of-Service
- Peak-Hour Travel Time
- Person Throughput
- Vehicle Miles Traveled in Congested Conditions
- Job/Housing Balance
- Transit Frequency
- Transit Coordination
- Pedestrian and Bicycle Investment

TAM, in cooperation with Marin County Transit District and Golden Gate Transit, Highway and Transportation District (Golden Gate Transit) staff, reports the performance measures monitored in the Performance Element (Chapter 3) in each CMP.

8.3.3 Maintaining a Program to Analyze the Impact of Land-Use Decisions

Land-use impact analysis monitoring requirements are detailed in the Land-Use Analysis Program (Chapter 5). Each jurisdiction is to be responsible for preparing and transmitting land-use data to TAM for use in the Marin Travel Model, as well as tracking the build-out of that land-use through issuance of planning and building permits. This requirement ties in with the existing property development ("PROPDEV") database that local governments are already using, as well as the County Community Development Agency's Countywide Land-Use Database. TAM biennially runs the Marin Travel Model for updating future year LOS information in the CMP. Local governments can find this information useful when updating the land-use and circulation elements of their general plans.

For any general plan update or amendment or major development proposal that would result in a net increase or decrease of 100 or more P.M. peak- hour vehicle trips, local governments are to forward information on the application to TAM and run the MTM to obtain transportation impact information related to the application. The jurisdiction is responsible for conducting the model run, which could be performed: (1) by the jurisdiction, (2) by a consultant hired by the jurisdiction, or (3) by TAM only if staff is available to do the work and the jurisdiction requesting the model run reimburses the County for the cost of the model run. Model results are useful to cities and the County as part of their current review and approval process, especially for purposes of defining the necessary mitigation measures.

In the next two years, a more formalized compliance process is likely to be developed. Failure to participate in this new process may result in a finding of non-compliance for a local jurisdiction.