



TRANSPORTATION AUTHORITY OF MARIN

FINAL

(APPROVED BY THE TAM BOARD ON MARCH 28, 2013)

2012

TRANSPORTATION SYSTEM MONITORING REPORT

Prepared for:

Transportation Authority of Marin

Prepared by:



**Kimley-Horn
and Associates, Inc.**

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1.0 EXECUTIVE SUMMARY

This report summarizes the results of the 2012 monitoring of level of service (LOS) standards for major arterial and freeway segments established in the Marin Congestion Management Program (CMP). **Table 1** summarizes the results of the 2012 monitoring efforts.

Table 1: Summary of Monitoring Results

Summary		AM Peak Hour				PM Peak Hour			
		Achieving CMP LOS Standards		Not Achieving CMP LOS Standards		Achieving CMP LOS Standards		Not Achieving CMP LOS Standards	
CMP Roadway	Locations	No.	%	No.	%	No.	%	No.	%
Arterial Segment LOS	17	17	100	0	0	17	100	0	0
Freeway Segment LOS	10	10	100	0	0	8	80	2	20

Arterial Level of Service: A total of 17 major arterial segment locations were monitored during the AM and the PM peak hour. All locations meet the CMP LOS standard during the AM and the PM peak hours. Each location operates at LOS D or better, which is higher than the adopted LOS standard (LOS D).

Freeway Segment Level of Service: A total of 10 freeway segment locations were monitored during the AM and the PM peak hour. All locations meet the CMP LOS standards during the AM peak hour. In the PM peak period, one of the freeway segments that is grandfathered fails to meet the LOS threshold. The segment of US-101 northbound from Tiburon Boulevard to Tamalpais Drive fails to meet the LOS E threshold in the PM peak. However, since this location is grandfathered, no action is necessary. Therefore, there are no locations where action is required for the PM peak period.



2.0 INTRODUCTION

The California Government Code requires each urbanized county within the state to develop a Congestion Management Program (CMP). The CMPs are intended to address transportation issues through transportation improvements, the establishment of multimodal standards, consistent analysis of land use impacts, and a program of transportation demand management. The CMP legislation also requires each Congestion Management Agency (CMA) to monitor the implementation of all elements of the CMP at least biennially. The Transportation Authority of Marin (TAM) is the designated CMA for Marin County, and therefore is responsible for preparing and updating the CMP and monitoring compliance. TAM has chosen to monitor the status of additional components beyond the CMP network LOS monitoring that may affect the County's overall transportation system. These components reflect Marin's unique needs and demands on its transportation system, such as bicyclist and pedestrian activity, weekend commutes, and an assessment of AM and PM peak hour travel. This CMP Monitoring Report includes:

- Background information relevant to this CMP Monitoring Report;
- Level of Service and Data Collection Methodology that was utilized in monitoring;
- Roadway monitoring level of service results;
- Necessary actions as a result of roadway monitoring results;
- Transit services provided in Marin;
- Bicycle and pedestrian activity in Marin;
- Additional system performance measures including aggregate peak hour travel time and person throughput.

2.1 Background

As part of the first Marin County CMP, level of service (LOS) standards were established for the CMP roadway network in 1991. Subsequent CMPs have studied the same corridors because once a roadway has been designated for the CMP roadway network, it cannot be removed per California Government Code Section 65089(b)(1)(A). In addition, having the same corridors allows for comparison from year to year to see historical trends.

The Marin CMP is maintained to be consistent with the Regional Transportation Plan (RTP) as developed by the Metropolitan Transportation Commission (MTC), which is the Bay Area's designated Metropolitan Planning Organization. Consistency with MTC's RTP is crucial to garnering funds for transportation improvement and maintenance projects. The Marin CMP roadway network is included in MTC's RTP, which allows for continuity between the adjacent county's roadway network.

The CMP roadway network was defined in the first CMP in 1991 under the following criteria:

- State Highways – All state highways within Marin County shall be included in the CMP network. Removal of the highway would require evaluation of roadway based on the principal arterial criteria.



- Principal Arterial Roadways – Arterial roadways were selected based on the following criteria:
 - Purpose and function of the roadway
 - Land use adjacent to the roadway and nearby activity centers
 - Average Daily Traffic (ADT) volume
 - Connectivity to other facilities

Table 2 below lists the CMP network roadways to be monitored. Specific roadway segments have been designated as grandfathered status, which is defined as a segment that was operating below the allowable LOS threshold standard when the first Marin CMP was established in 1991. **Figure 1** shows the monitored highway and arterial roadways in Marin County.



Table 2: Marin County-wide Transportation Network Segments

Old #	New #	Street	From	To	Roadway Type	Grandfathered Status
25	1A	Shoreline Hwy (SR-1)	US-101	Tennessee Valley	Arterial	No
19	1B	Shoreline Hwy (SR-1)	Northern Ave	Almonte Blvd	Arterial	Yes
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Pt. Reyes	Arterial	No
5	2A	SR-37	US-101	Atherton Ave	Freeway	No
21	3A	US-101	N. of Gold Gate Bridge	Spencer Ave	Freeway	No
17	3B	US-101	Tiburon Blvd (SR-131)	Tamalpais Dr	Freeway	Yes
13	3C	US-101	Sir Francis Drake Blvd	I-580	Freeway	Yes
11	3D	US-101	I-580	Mission Ave	Freeway	Yes
8	3E	US-101	Mission Ave	N. San Pedro Rd	Freeway	Yes
7	3F	US-101	Freitas Pkwy	Lucas Valley Rd	Freeway	Yes
2	3G	US-101	Atherton Ave	Sonoma County Line	Freeway	Yes
18	4A	Tiburon Blvd (SR-131)	Redwood Frontage Rd	Strawberry Dr	Arterial	Yes
15	5A	I-580	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd	Freeway	Yes
14	5B	I-580	Sir Francis Drake Blvd	Bellam Blvd	Freeway	Yes
3	6A	Novato Blvd	San Marin Dr	Eucalyptus Dr	Arterial	Yes
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	Arterial	Yes
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	Arterial	No
6	7A	Ignacio Blvd	US-101	Commercial Blvd	Arterial	No
22	8A	Sir Francis Drake Blvd	Willow Ave	Butterfield Rd	Arterial	Yes
9	8B	Sir Francis Drake Blvd	San Anselmo Ave	Red Hill Ave	Arterial	No
23	8C	Sir Francis Drake Blvd	Toussin Ave	College Ave	Arterial	No
12	8D	Sir Francis Drake Blvd	College Ave	Wolfe Grade	Arterial	No
16	8E	Sir Francis Drake Blvd	US-101	Larkspur Landing Circle	Arterial	Yes
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Hilldale Dr	Arterial	Yes
26	9B	2nd St	Marquard Ave/4th St	US-101	Arterial	Yes
27	9C	3rd St	US-101	Marquard Ave/4th St	Arterial	Yes
20	10A	Bridgeway Blvd	Gate 5 Rd	Gate 6 Rd	Arterial	Yes



Figure 1: Marin CMP Roadway Network



For monitoring major arterial and freeway segments, the 1991 CMP established LOS standards using travel time and average speed along each segment. LOS D is the standard for urban and suburban arterial roadways, and LOS E is the standard for freeways and rural expressways. Certain roadway segments that operated at a lower LOS than the standard that was established in 1991 are “grandfathered” roadway segments, allowing for continued operation lower than the LOS standard typically for that type of roadway.

In Marin County, most major arterial segments and freeway segments on the CMP network are monitored biennially, as mandated by the California Government Code sections 65089.3, 65089.4, and 65089.5. If it is determined that the level of service for a particular roadway facility is LOS A, B, or C for any year, then the monitoring frequency could be reduced to once every other CMP (i.e. once every four years). Any facility that operates at LOS D or worse should be monitored during each CMP. Facilities that operate at LOS F and are “grandfathered” facilities should be monitored during each CMP.

The frequency of monitoring is outlined in **Table 3**. The last full monitoring of the CMP network was completed in 2010 and all roadway and freeway segments on the CMP network were monitored as part of this 2012 effort and reported herein.

Table 3: Frequency of CMP Monitoring

Facility Type	LOS in Most Recent Monitoring Report	Period of Monitoring
Freeway	LOS C or better (> 54 mph)	Every four years*
Freeway	LOS D or worse (< 54 mph)	Biennial
Major Arterial	LOS C or better (> 13 mph)	Every four years*
Major Arterial	LOS D or worse (< 13 mph)	Biennial
Grandfathered	-	Biennial

* Optional to be monitored every other CMP

Although there were multiple roadways in 2010 that operated at LOS C or better, including Shoreline Highway (SR-1), Tiburon Boulevard (SR-131), Novato Boulevard, certain segments of Sir Francis Drake Boulevard, and 2nd and 3rd Street, all roadway segments were monitored again in 2012.



3.0 METHODOLOGY

This section of the Monitoring Plan describes the methodology used to calculate major arterial and freeway levels of service. This section also describes the data collection methodology.

Level of service is one of the most traditional measures of transportation system performance. It rates the traffic conditions as perceived by the driver by assigning a letter value A through F, with A corresponding to excellent conditions and F corresponding to poor traffic conditions.

3.1 Major Arterial Level of Service Methodology

Major arterial LOS was established using the methodologies described in the *Highway Capacity Manual*¹. Freeway segment LOS is determined by the segment travel speed. **Table 4** describes the relationship between the segment travel speed and LOS for major arterial roadways used to determine the LOS for the segment.

Table 4: Level of Service for Roadway Segments

Vehicle Travel Arterial Speed	Estimated Arterial LOS
25 mph	A
20 mph	B
13 mph	C
10 mph	D
7 mph	E
< 7 mph	F

3.2 Freeway Level of Service Methodology

Freeway LOS was established using the methodologies described in the *Highway Capacity Manual*. Roadway segment LOS is determined by the segment travel speed. **Table 5** describes the relationship between the segment travel speed and LOS for freeways used to determine the LOS for the segment.

¹ *Highway Capacity Manual*, Transportation Research Board, 2010.



Table 5: Freeway Level of Service Methodology

Vehicle Travel Freeway Speed	Estimated Freeway LOS
60 mph	A
57 mph	B
54 mph	C
46 mph	D
30 mph	E
< 30 mph	F

3.3 Pedestrian and Bicycle Performance Methodology

Pedestrian and bicycle volume counts were collected and compared to previous volumes at similar locations. Historic pedestrian and bicycle information can be found in the November 2011 Walk Bike Marin report for the Nonmotorized Transportation Pilot Program titled: *Summary of 2007, 2008, 2009, 2010, and 2011 Bicycle and Pedestrian Counts Survey*.² Counts collected in 2012 were summarized and compared to the previous data collected to determine the overall changes in pedestrian and bicyclist activity and measure the effectiveness of investments in pedestrian and bicycle infrastructure. Pedestrian and bicycle performance is not mandated to be a part of the CMP and is discussed for informational purposes only.

3.4 Data Collection Methodology for CMP Roadway Segments

CMP roadway segments were monitored at the locations listed in **Table 6**. These monitoring locations were consistent with previous CMPs for year-to-year comparison. Roadway segment volumes were collected along each roadway segment. The counts were conducted during the AM (7:00 AM to 9:00 AM) and PM (4:30 PM to 6:30 PM) peak periods, as well as midday Saturday PM (12:00 PM to 2:00 PM) peak periods. The counts were recorded in 15-minute intervals and the one-hour period with the highest traffic volumes reported. In addition to volume counts, vehicle occupancy data were collected at specific locations.

Weekday roadway segment counts were conducted on a Tuesday, Wednesday, or Thursday to represent “typical” traffic conditions and not collected on Monday or Friday. Midday weekend peak period roadway segment counts were conducted on Saturday to represent “typical” traffic conditions. Roadway segment volume counts were collected in October and November 2012 when there are minimal national or state holidays. Counts were not collected during days when conditions such as traffic incidents, construction activity, special events, or weather (i.e., rain or fog) are likely to occur near or at the data collection site.

² *Summary of 2007, 2008, 2009, 2010, and 2011 Bicycle and Pedestrian Counts and Surveys*, Alta Planning + Design, November 2011.



Table 6: CMP Roadway Segment Monitoring Locations

Segment		Segment Boundaries		Monitoring Locations		
Old #	New #	Street	From	To	From	To
25	1A	Shoreline Hwy (SR-1)	US-101	Almonte Blvd	US-101	Tennessee Valley
19	1B	Shoreline Hwy (SR-1)	Almonte Blvd	Sir Francis Drake Blvd	Northern Ave	Almonte Blvd
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Sonoma County Line	Sir Francis Drake Blvd	Pt. Reyes
5	2A	SR-37	US-101	Sonoma County Line	US-101	Atherton Ave
21	3A	US-101	San Francisco County Line	Highway 1	N. of Gold Gate Bridge	Spencer Ave
17	3B	US-101	Tiburon Blvd (SR-131)	Sir Francis Drake Blvd	Tiburon Blvd (SR-131)	Tamalpais Dr
13	3C	US-101	Sir Francis Drake Blvd	I-580	Sir Francis Drake Blvd	I-580
11	3D	US-101	I-580	Mission Ave	I-580	Mission Ave
8	3E	US-101	Mission Ave	N. San Pedro Rd	Mission Ave	N. San Pedro Rd
7	3F	US-101	N. San Pedro Rd	SR-237	Freitas Pkwy	Lucas Valley Rd
2	3G	US-101	SR-237	Sonoma County Line	Atherton Ave	Sonoma County Line
18	4A	Tiburon Blvd (SR-131)	US-101	Main Street	Redwood Frontage Rd	Strawberry Dr
15	5A	I-580	Contra Costa County Line	Sir Francis Drake Blvd	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd
14	5B	I-580	Sir Francis Drake Blvd	US-101	Sir Francis Drake Blvd	Bellam Blvd
3	6A	Novato Blvd	San Marin Dr	Wilson Ave	San Marin Dr	Eucalyptus Dr
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	Wilson Ave	Diablo Ave
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	Sunset Pkwy	US-101
6	7A	Ignacio Blvd	US-101	Commercial Blvd	US-101	Commercial Blvd
22	8A	Sir Francis Drake Blvd	Highway 1	Butterfield Rd	Willow Ave	Butterfield Rd
9	8B	Sir Francis Drake Blvd	Butterfield Rd	Red Hill Ave	San Anselmo Ave	Red Hill Ave
23	8C	Sir Francis Drake Blvd	Red Hill Ave	College Ave	Toussin Ave	College Ave
12	8D	Sir Francis Drake Blvd	College Ave	US-101	College Ave	Wolfe Grade
16	8E	Sir Francis Drake Blvd	US-101	I-580	US-101	Larkspur Landing Circle
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Marquard Ave/4th St	Sir Francis Drake Blvd	Hilldale Dr
26	9B	2nd St	Marquard Ave/4th St	US-101	Marquard Ave/4th St	US-101
27	9C	3rd St	US-101	Marquard Ave/4th St	US-101	Marquard Ave/4th St
20	10A	Bridgeway Blvd	US-101	US-101	Gate 5 Rd	Gate 6 Rd



Roadway segment travel times were determined using GPS data collected along each roadway segment. The travel times were conducted during the AM (7:00 AM to 9:00 AM) and PM (4:30 PM to 6:30 PM) peak periods, similar to the volume counts. Roadway segment travel times were conducted on a Tuesday, Wednesday, or Thursday to represent “typical” traffic conditions and were not collected on Monday or Friday, similar to volume counts. Travel times were not collected during days when conditions such as traffic incidents, construction activity, special events, or weather (i.e., rain or fog) are likely to occur near or at the data collection site.

The number of total weekday AM and PM peak samples for each segment were based on obtaining a statistically significant estimate of travel time using recommended procedures established by the Institute of Transportation Engineers (ITE). Based on the purpose of the travel time surveys conducted for this report, an error of ± 2.0 mph was permitted in the calculation of the mean travel speed. This permitted error relates to an appropriate minimum sample size requirement for travel time studies with a statistical significance of 90%.³ Consistent with the requirements set forth by TAM and a goal to collect monitoring results which are statistically valid, KHA collected no less than six (6) runs per segment in both the AM and PM peak periods. If this initial sample size of six (6) runs was found to be insufficient to determine the travel time at a statistical significance of 90%, additional travel time runs were completed to conform to the ITE procedure.

The goal of the travel time runs is to record the prevailing speed of the roadway segments under “typical” conditions. The floating car technique was utilized and required the driver to travel at a speed as if it is “floating” in the traffic stream. The driver traveled at such a speed that the driver would pass a slower vehicle for each faster vehicle that passes the driver. By Caltrans Standard however, the driver did not exceed the posted speed limit. On a two-lane freeway segment, travel time runs alternated between lanes to capture typical speeds.

Any incidents observed within the study area or on adjacent roadways that affect conditions within the study area are reasons to cancel the runs. Traffic reports were monitored on commercial radio stations for any reported incidents that may affect traffic conditions on the route being studied. This included incidents on other routes that may result in non-typical conditions on the route being monitored. Incidents were also be monitored in the office on 511.org.

3.5 Data Collection Methodology for Pedestrian and Bicycle Counts

Pedestrian and bicycle counts were collected at the locations identified in **Table 7**. Similar to traffic counts, weekday counts were conducted on a Tuesday, Wednesday, or Thursday to represent “typical” traffic conditions and not collected on Monday or Friday. Weekend counts were conducted on a Saturday to represent “typical” weekend traffic conditions. Pedestrian and bicycle counts were not collected during days when conditions such as construction activity, special events, or weather (i.e., rain or fog) are likely to occur near or at the data collection site. Counts from previous years were collected in September and early October, however counts in 2012 were collected in mid-October to early November. This discrepancy in time of the year for

³ *Sample Size Determination for Travel Time and Delay Studies*, ITE Journal – Traffic Engineering, 1976.



data collection should not affect any seasonal variation of the data since schools were in session and no major holidays occurred.

Pedestrian and bicycle counts surveyed the total number persons, and additionally differentiated children from adults, as well as the gender of the persons. Other attributes surveyed included helmet usage for bicyclists and contra flow travel (riding against traffic).

The counts were based on the National Bicycle & Pedestrian Documentation Project methodology in an effort to have consistency between data collection years. This methodology of pedestrian and bicycle count collection used manual screen line counting. Manual screen line counting is the process of counting pedestrians and bicyclists that cross an imaginary line on the sidewalk, roadway, or path. Each pedestrian and bicyclist that crosses this imaginary line in either direction is counted. Illustrations of each location in relative to the screen line are documented in the **Appendix**. These exact locations were confirmed with Dan Dawson of Marin County prior to data collection.

Table 7: Pedestrian and Bicycle Count Locations

#	Location	Weekday Counts 7-9 AM and 4-6 PM	Weekday Counts 7-9 AM and 2- 6 PM	Weekend Counts 12-2 PM
1	Tiburon Blvd at Main Street, Tiburon	Yes	No	Yes
2	Miller Ave. at Throckmorton, Mill Valley	Yes	No	Yes
3	4th and B St., San Rafael	Yes	No	Yes
4	Bridgeway at Princess St., Sausalito	Yes	No	Yes
5	San Anselmo Ave at Tunstead, Ave., San Anselmo	Yes	No	Yes
6	Broadway at Bolinas Rd., Fairfax	Yes	No	Yes
7	Grant Ave., at Redwood Blvd., Novato)	Yes	No	Yes
8	Magnolia Ave. at Ward St., Larkspur	Yes	No	Yes
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	Yes	No	Yes
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	Yes	No	Yes
11	Tiburon Bike Path at Blackie's Pasture, Tiburon	No	Yes	Yes
12	Larkspur-Corte Madera Path at Baltimore Wye	Yes	No	Yes
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	Yes	No	Yes
14	Medway Rd. at Belvedere St., San Rafael	Yes	No	Yes
15	Camino Alto at E. Blithedale, Mill Valley	Yes	No	Yes
16	Alameda Del Prado at Nave Drive, Novato	Yes	No	Yes
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	Yes	No	Yes
18	Doherty Dr. at Hall Middle School, Larkspur ¹	No	No	No
19	Sir Francis Drake at Wolfe Grade, Kentfield	No	Yes	Yes
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	Yes	No	Yes
21	South Novato Blvd. at Rowland; Novato	Yes	No	Yes
22	Bellam at Andersen, San Rafael	Yes	No	Yes
23	Nicasio Valley Road near Nicasio School, Nicasio	No	No	Yes

¹No counts will be collected on Doherty Drive due to construction closure



3.6 Supplemental Deficiency Analysis & Data Collection

For the roadway segment LOS analysis, if the calculated LOS at a CMP roadway segment exceeds the adopted LOS standard and is not grandfathered in, TAM policy requires that two additional volume counts or travel time surveys will be conducted at the potentially deficient location. If at least one of the supplemental analyses confirms the deficiency (that is, the location was shown to be deficient on multiple days monitored), a memorandum reporting this finding should be prepared. All other performance analyses are not required in the Monitoring Program, and therefore are for informational purposes only.



4.0 ROADWAY MONITORING RESULTS

This section of the report documents the 2012 monitoring results for arterial and freeway level of service on the CMP roadway network.

4.1 Arterial Level of Service

Major arterial LOS was monitored at 17 locations throughout Marin County. All locations met the CMP LOS standard during the AM and PM peak hours. Each location operated at LOS D or better, which is better than the adopted LOS standard (LOS D).

The monitoring results for major arterial segments in the AM and PM peaks are summarized in **Table 8** and **Table 9**, respectively.

4.2 Freeway Level of Service

A total of 10 freeway segment locations were monitored during the AM and PM peak hours. All locations met the CMP LOS standards during the AM peak hour. One location did not meet the CMP LOS standards during the PM peak hour. The northbound freeway segment on US-101 from Tiburon Boulevard to Tamalpais Drive (HOV lane and SOV lanes) operates at LOS F during the PM peak hour. This is higher than the adopted LOS standard (LOS E).

The monitoring results for freeway segments in the AM and PM peaks are summarized in **Table 8** and **Table 9**, respectively.

The northbound freeway segment on US-101 from Tiburon Boulevard to Tamalpais Drive (HOV lane and SOV lanes) does not meet the LOS E standard in the PM peak, but this segment is grandfathered in and therefore will not need a deficiency improvement plan. The average speed for this particular segment in the HOV and SOV lanes is approximately 22 mph. This can be attributed to the heavy congestion with motorists trying to exit to Sir Francis Drake Boulevard to get to I-580 and the San Rafael-Richmond Bridge. Speeds increase to 50+ mph between Sir Francis Drake Boulevard and I-580 due to the number of vehicles exiting the freeway just south of this segment. It should also be noted that this particular segment has not met the LOS threshold in every CMP since 2005.



Table 8: Roadway Segment LOS Summary – AM Peak Period

Old Segment ID #	New #	Street	From	To	Roadway Type	Length (miles)	Northbound / Eastbound					Southbound / Westbound					LOS Standard	Grandfathered Status
							Direction	Average Time (sec)	Average Time (min)	Average Speed (mph)	LOS Result	Direction	Average Time (sec)	Average Time (min)	Average Speed (mph)	LOS Result		
25	1A	Shorline Hwy (SR-1)	US-101	Tennessee Valley	Arterial	0.3	NB	44	0.73	30.3	A	SB	63	1.05	22.6	B	D	No
19	1B	Shorline Hwy (SR-1)	Northern Ave	Almonte Blvd	Arterial	0.8	NB	105	1.75	28.9	A	SB	181	3.01	21.9	B	D	Yes
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Pt Reyes	Arterial	2.1	NB	215	3.58	34.6	A	SB	213	3.55	34.8	A	D	No
5	2A	SR-37	US-101	Atherton Ave	Freeway	2.3	EB	134	2.24	61.7	A	WB	134	2.23	59.5	B	E	No
21	3A	US-101	N. of GGB	Spencer Ave	Freeway	2	NB	95	1.59	45.1	E	SB	111	1.85	47.8	D	E	No
17	3B	US-101	Tiburon Blvd (SR-131)	Tamalpais Dr	Freeway	1.7	NB	140	2.34	39.7	E	SB	98	1.64	46.9	E	E	Yes
							No NB HOV lane in AM Peak					SB HOV	100	1.66	59.6	B	E	Yes
13	3C	US-101	Sir Francis Drake Blvd	I-580	Freeway	1.3	NB	84	1.40	56.4	C	SB	109	1.82	44.5	E	E	Yes
							No NB HOV lane in AM Peak					SB HOV	85	1.42	55.9	C	E	Yes
11	3D	US-101	I-580	Mission Ave	Freeway	1.1	NB	73	1.22	55.3	C	SB	86	1.44	47.4	D	E	Yes
							No NB HOV lane in AM Peak					SB HOV	70	1.17	57.0	B	E	Yes
8	3E	US-101	Mission Ave	N. San Pedro Rd	Freeway	1.6	NB	101	1.69	56.8	C	SB	112	1.86	51.7	D	E	Yes
							No NB HOV lane in AM Peak					SB HOV	101	1.69	57.0	B	E	Yes
7	3F	US-101	Frietas Pkwy	Lucas Valley Rd	Freeway	1.0	NB	43	0.71	64.7	A	SB	95	1.59	32.0	E	E	Yes
							No NB HOV lane in AM Peak					SB HOV	98	1.64	39.0	E	E	Yes
2	3G	US-101	Atherton Ave	Sonoma County Line	Freeway	5.3	NB	316	5.27	61.6	A	SB	331	5.52	58.7	B	E	Yes
18	4A	Tiburon Blvd (SR-131)	Redwood Frontage Rd	Strawberry Dr	Arterial	0.5	EB	100	1.66	21.9	B	WB	79	1.32	26.9	A	D	No
15	5A	I-580	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd	Freeway	0.7	EB	40	0.67	56.1	C	WB	50	0.83	44.8	E	E	No
14	5B	I-580	Sir Francis Drake Blvd	Bellam Blvd	Freeway	1.4	EB	79	1.31	55.1	C	WB	89	1.48	54.1	C	E	Yes
3	6A	Novato Blvd	San Marin Dr	Eucalyptus Dr	Arterial	0.4	NB	76	1.26	22.1	B	SB	68	1.13	24.1	B	D	No
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	Arterial	0.7	NB	177	2.95	24.1	B	SB	184	3.06	23.5	B	D	No
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	Arterial	1.1	NB	157	2.61	26.0	A	SB	230	3.83	16.8	C	D	No
6	7A	Ignacio Blvd	US-101	Commercial Blvd	Arterial	0.3	EB	42	0.70	21.3	B	WB	19	0.32	27.8	A	D	Yes
22	8A	Sir Francis Drake Blvd	Willow Ave	Butterfield Rd	Arterial	0.2	EB	59	0.98	17.5	C	WB	62	1.04	16.4	C	D	Yes
9	8B	Sir Francis Drake Blvd	San Anselmo Ave	Red Hill Ave	Arterial	1.1	EB	288	4.80	16.6	C	WB	217	3.62	18.8	C	D	Yes
23	8C	Sir Francis Drake Blvd	Toussin Ave	College Ave	Arterial	0.3	EB	126	2.10	10.7	D	WB	45	0.75	23.1	B	D	Yes
12	8D	Sir Francis Drake Blvd	College Ave	Wolfe Grade	Arterial	0.6	EB	91	1.51	25.9	A	WB	89	1.48	25.7	A	D	Yes
16	8E	Sir Francis Drake Blvd	US-101	Larkspur Landing Circle	Arterial	0.4	EB	100	1.67	18.1	C	WB	191	3.19	10.7	D	D	Yes
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Hilldale Dr	Arterial	0.4	EB	75	1.25	23.9	B	WB	146	2.44	10.6	D	D	No
26	9B	2nd St ¹	Marquard Ave/4th St	US-101	Arterial	0.8	EB	263	4.38	17.1	C	One-way Street					D	No
27	9C	3rd St ²	US-101	Marquard Ave/4th St	Arterial	0.8	One-way Street					WB	198	3.30	20.2	B	D	No
20	10A	Bridgeway Blvd	Gate 5 Rd	Gate 6 Rd	Arterial	0.2	NB	52	0.86	16.1	C	SB	27	0.45	25.7	A	D	No

¹ 2nd Street from Marquard Avenue to US-101 is a one-way street EB only

² 3rd Street from US-101 to Marquard Avenue is a one-way street WB only

Note: Locations below the appropriate LOS thresholds are identified in **BOLD**. Locations identified as needing an improvement plan are highlighted as well.

Table 9: Roadway Segment LOS Summary – PM Peak Period

Old Segment ID #	New #	Street	From	To	Roadway Type	Length (miles)	Northbound / Eastbound					Southbound / Westbound					LOS Standard	Grandfathered Status
							Direction	Average Time (sec)	Average Time (min)	Average Speed (mph)	LOS Result	Direction	Average Time (sec)	Average Time (min)	Average Speed (mph)	LOS Result		
25	1A	Shorline Hwy (SR-1)	US-101	Tennessee Valley	Arterial	0.3	NB	79	1.31	20.2	B	SB	77	1.29	18.5	C	D	No
19	1B	Shorline Hwy (SR-1)	Northern Ave	Almonte Blvd	Arterial	0.8	NB	108	1.80	27.9	A	SB	120	2.00	24.9	B	D	Yes
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Pt Reyes	Arterial	2.1	NB	206	3.43	36.0	A	SB	208	3.46	35.8	A	D	No
5	2A	SR-37	US-101	Atherton Ave	Freeway	2.3	EB	134	2.24	61.9	A	WB	133	2.22	60.0	A	E	No
21	3A	US-101	N. of GGB	Spencer Ave	Freeway	2	NB	98	1.63	43.8	E	SB	260	4.33	36.4	E	E	No
17	3B	US-101	Tiburon Blvd (SR-131)	Tamalpais Dr	Freeway	1.7	NB	241	4.01	22.8	F	SB	92	1.53	49.7	D	E	Yes
							NB HOV	283	4.71	21.7	F	No SB HOV in PM Peak				E	Yes	
13	3C	US-101	Sir Francis Drake Blvd	I-580	Freeway	1.3	NB	91	1.51	52.4	D	SB	88	1.47	54.0	C	E	Yes
							NB HOV	89	1.48	53.5	D	No SB HOV in PM Peak				E	Yes	
11	3D	US-101	I-580	Mission Ave	Freeway	1.1	NB	80	1.34	51.1	D	SB	73	1.21	55.4	C	E	Yes
							NB HOV	74	1.24	53.7	D	No SB HOV in PM Peak				E	Yes	
8	3E	US-101	Mission Ave	N. San Pedro Rd	Freeway	1.6	NB	110	1.84	52.9	D	SB	172	2.87	37.1	E	E	Yes
							NB HOV	110	1.83	54.2	C	No SB HOV in PM Peak				E	Yes	
7	3F	US-101	Frietas Pkwy	Lucas Valley Rd	Freeway	1.0	NB	46	0.77	59.8	B	SB	46	0.77	60.3	A	E	Yes
							NB HOV	62	1.03	58.9	B	No SB HOV in PM Peak				E	Yes	
2	3G	US-101	Atherton Ave	Sonoma County Line	Freeway	5.3	NB	605	10.08	33.8	E	SB	319	5.31	60.9	A	E	Yes
18	4A	Tiburon Blvd (SR-131)	Redwood Frontage Rd	Strawberry Dr	Arterial	0.5	EB	80	1.34	27.4	A	WB	79	1.31	26.9	A	D	No
15	5A	I-580 ¹	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd	Freeway	3.3 (EB) 0.7 (WB)	EB	312	5.20	38.8	E	WB	36	0.60	55.8	C	E	No
14	5B	I-580	Sir Francis Drake Blvd	Bellam Blvd	Freeway	1.4	EB	121	2.01	44.5	E	WB	86	1.43	55.8	C	E	Yes
3	6A	Novato Blvd	San Marin Dr	Eucalyptus Dr	Arterial	0.4	NB	68	1.13	23.7	B	SB	64	1.06	25.3	A	D	No
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	Arterial	0.7	NB	193	3.21	22.0	B	SB	192	3.20	22.3	B	D	No
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	Arterial	1.1	NB	164	2.73	24.7	B	SB	128	2.14	29.1	A	D	No
6	7A	Ignacio Blvd	US-101	Commercial Blvd	Arterial	0.3	EB	38	0.64	26.8	A	WB	27	0.45	21.6	B	D	Yes
22	8A	Sir Francis Drake Blvd	Willow Ave	Butterfield Rd	Arterial	0.2	EB	34	0.57	25.5	A	WB	55	0.91	19.3	C	D	Yes
9	8B	Sir Francis Drake Blvd	San Anselmo Ave	Red Hill Ave	Arterial	1.1	EB	235	3.92	17.3	C	WB	208	3.46	20.2	B	D	Yes
23	8C	Sir Francis Drake Blvd	Toussin Ave	College Ave	Arterial	0.3	EB	98	1.63	12.0	D	WB	56	0.93	19.9	C	D	Yes
12	8D	Sir Francis Drake Blvd	College Ave	Wolfe Grade	Arterial	0.6	EB	83	1.38	26.9	A	WB	94	1.56	24.2	B	D	Yes
16	8E	Sir Francis Drake Blvd	US-101	Larkspur Landing Circle	Arterial	0.4	EB	169	2.82	13.4	C	WB	169	2.82	10.7	D	D	Yes
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Hilldale Dr	Arterial	0.4	EB	55	0.91	27.6	A	WB	158	2.63	13.1	C	D	No
26	9B	2nd St ²	Marquard Ave/4th St	US-101	Arterial	0.8	EB	242	4.04	16.6	C	One-way Street				D	No	
27	9C	3rd St ³	US-101	Marquard Ave/4th St	Arterial	0.8	One-way Street				WB	215	3.59	18.4	C	D	No	
20	10A	Bridgeway Blvd	Gate 5 Rd	Gate 6 Rd	Arterial	0.2	NB	43	0.71	19.5	C	SB	28	0.47	25.6	A	D	No

¹ I-580 in the EB direction is measured from Sir Francis Drake Boulevard to the County line

² 2nd Street from Marquard Avenue to US-101 is a one-way street EB only

³ 3rd Street from US-101 to Marquard Avenue is a one-way street WB only

 Note: Locations below the appropriate LOS thresholds are identified in **BOLD**. Locations identified as needing an improvement plan are highlighted as well.



4.3 Historical Levels of Service

The LOS results in 2012 were compared to historical levels of service for each of the roadway segments from previous CMPs. It should be noted that in 2003 and 2005, the LOS was determined using an older method in which volume to capacity (V/C) was used to determine LOS. Since 2005, the methodology for determining LOS has been updated to analyze freeway speeds and travel times to determine LOS, instead of V/C. This methodology is recommended by the *Highway Capacity Manual*.

Table 10 shows the LOS results for the PM peak hour only and in the congested direction from each CMP from 2003 to 2012. The 2012 LOS results compare closely to the previous years. At the two locations that failed to meet the LOS thresholds, there was historical evidence that showed previous failure.

The roadway segment on US-101 from Tiburon Boulevard to Tamalpais Drive in the northbound direction has operated at LOS F every CMP year since 2005. This is not a surprise since it was grandfathered in as a segment that has failed and there have been no substantial capacity improvements on this segment since 2005.



Table 10: Historical Roadway LOS Results in PM Peak in Peak Direction

Old Segment ID #	New #	Street	From	To	2003 (Old Method)	2005 (Old Method)	2006	2008	2010	2012	LOS Standard	Grandfathered Status
25	1A	Shorline Hwy (SR-1)	US-101	Tennessee Valley	N/A	N/A	N/A	B	B	C	D	No
19	1B	Shorline Hwy (SR-1)	Northern Ave	Almonte Blvd	C	F	B	A	A	B	D	Yes
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Pt Reyes	A	A	A	A	A	A	D	No
5	2A	SR-37	US-101	Atherton Ave	C	C	A	B	A	A	E	No
21	3A	US-101	N. of GGB	Spencer Ave	C	C	A	A	D	E	E	No
17	3B	US-101	Tiburon Blvd (SR-131)	Tamalpais Dr	C	F	F	F	F	F	E	Yes
13	3C	US-101	Sir Francis Drake Blvd	I-580	F	F	F	E	D	D	E	Yes
11	3D	US-101	I-580	Mission Ave	F	F	F	E	E	D	E	Yes
8	3E	US-101	Mission Ave	N. San Pedro Rd	F	F	C	F	E	D	E	Yes
7	3F	US-101	Frietas Pkwy	Lucas Valley Rd	C	E	A	A	D	B	E	Yes
2	3G	US-101	Atherton Ave	Sonoma County Line	F	D	E	F	E	E	E	Yes
18	4A	Tiburon Blvd (SR-131)	Redwood Frontage Rd	Strawberry Dr	C	C	A	A	B	A	D	No
15	5A	I-580	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd	E	C	F	E	A	E	E	No
14	5B	I-580	Sir Francis Drake Blvd	Bellam Blvd	B	F	E	E	D	E	E	Yes
3	6A	Novato Blvd	San Marin Dr	Eucalyptus Dr	A	A	B	C	A	B	D	No
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	C	E	C	B	C	B	D	No
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	A	A	A	A	A	B	D	No
6	7A	Ignacio Blvd	US-101	Commercial Blvd	C	C	B	C	B	B	D	Yes
22	8A	Sir Francis Drake Blvd	Willow Ave	Butterfield Rd	F	F	D	F	D	C	D	Yes
9	8B	Sir Francis Drake Blvd	San Anselmo Ave	Red Hill Ave	E	E	C	C	C	B	D	Yes
23	8C	Sir Francis Drake Blvd	Toussin Ave	College Ave	F	F	C	D	D	C	D	Yes
12	8D	Sir Francis Drake Blvd	College Ave	Wolfe Grade	C	B	C	A	B	B	D	Yes
16	8E	Sir Francis Drake Blvd	US-101	Larkspur Landing Circle	F	C	F	E	C	D	D	Yes
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Hilldale Dr	D	C	B	D	D	C	D	No
26	9B	2nd St	Marquard Ave/4th St	US-101	N/A	N/A	N/A	N/A	C	C	D	No
27	9C	3rd St	US-101	Marquard Ave/4th St	N/A	N/A	N/A	N/A	C	C	D	No
20	10A	Bridgeway Blvd	Gate 5 Rd	Gate 6 Rd	C	B	B	C	D	C	D	No

Note: Locations below the appropriate LOS thresholds are identified in **BOLD**. Locations identified as needing an improvement plan are highlighted as well.



4.4 Actions

The study roadway segments were divided into four different levels based upon their grandfathered status and whether appropriate actions need to take place to remedy the LOS deficiency. The four levels are:

1. Action Required – Non-grandfathered Segment and fails the LOS Standard
2. No Action Required – Grandfathered Segment and fails the LOS Standard
3. No Action Required – Non-grandfathered Segment and meets the LOS Standard
4. No Action Required – Grandfathered Segment and meets the LOS Standard

Table 11 and **Table 12** below show which level each segment belongs to and the required action for the AM and PM peak periods, respectively.

In the AM peak period, every segment meets the LOS Standard; 13 of the segments are non-grandfathered and 14 segments are grandfathered. Since there are no locations that fail LOS standards, no action is required for the AM peak period.

In the PM peak period, all of the 13 segments that are non-grandfathered meet the LOS threshold. In the PM peak period, one of the 14 segments that are grandfathered fails to meet the LOS threshold. The segment of US-101 northbound from Tiburon Boulevard to Tamalpais Drive fails to meet the LOS threshold in the PM peak. However, since this location is grandfathered, no action is necessary. Therefore, there are no locations where action is required for the PM peak period.



Table 11: Action Required for each Roadway Segment in the AM Peak Hour

Old Segment ID #	New #	Street	From	To	Roadway Type	Northbound / Eastbound		Southbound / Westbound		LOS Standard	Grandfathered Status	Required Action
						Direction	LOS Result	Direction	LOS Result			
Action Required - Non-Grandfathered and Fails LOS Standard												
None												
No Action Required - Grandfathered and Fails LOS Standard												
None												
No Action Required - Non-Grandfathered and Meets LOS Standard												
25	1A	Shorline Hwy (SR-1)	US-101	Tennessee Valley	Arterial	NB	A	SB	B	D	No	None - Meets LOS Standard
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Pt Reyes	Arterial	NB	A	SB	A	D	No	None - Meets LOS Standard
5	2A	SR-37	US-101	Atherton Ave	Freeway	EB	A	WB	B	E	No	None - Meets LOS Standard
21	3A	US-101	N. of GGB	Spencer Ave	Freeway	NB	E	SB	D	E	No	None - Meets LOS Standard
18	4A	Tiburon Blvd (SR-131)	Redwood Frontage Rd	Strawberry Dr	Arterial	EB	B	WB	A	D	No	None - Meets LOS Standard
15	5A	I-580	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd	Freeway	EB	C	WB	E	E	No	None - Meets LOS Standard
3	6A	Novato Blvd	San Marin Dr	Eucalyptus Dr	Arterial	NB	B	SB	B	D	No	None - Meets LOS Standard
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	Arterial	NB	B	SB	B	D	No	None - Meets LOS Standard
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	Arterial	NB	A	SB	C	D	No	None - Meets LOS Standard
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Hilldale Dr	Arterial	EB	B	WB	D	D	No	None - Meets LOS Standard
26	9B	2nd St ¹	Marquard Ave/4th St	US-101	Arterial	EB	C	One-way Street		D	No	None - Meets LOS Standard
27	9C	3rd St ²	US-101	Marquard Ave/4th St	Arterial	One-way Street		WB	B	D	No	None - Meets LOS Standard
20	10A	Bridgeway Blvd	Gate 5 Rd	Gate 6 Rd	Arterial	NB	C	SB	A	D	No	None - Meets LOS Standard
No Action Required - Grandfathered and Meets LOS Standard												
19	1B	Shorline Hwy (SR-1)	Northern Ave	Almonte Blvd	Arterial	NB	A	SB	B	D	Yes	None - Meets LOS Standard
17	3B	US-101	Tiburon Blvd (SR-131)	Tamalpais Dr	Freeway	NB	E	SB	E	E	Yes	None - Meets LOS Standard
						No NB HOV lane in AM Peak		SB HOV	B	E	Yes	None - Meets LOS Standard
13	3C	US-101	Sir Francis Drake Blvd	I-580	Freeway	NB	C	SB	E	E	Yes	None - Meets LOS Standard
						No NB HOV lane in AM Peak		SB HOV	C	E	Yes	None - Meets LOS Standard
11	3D	US-101	I-580	Mission Ave	Freeway	NB	C	SB	D	E	Yes	None - Meets LOS Standard
						No NB HOV lane in AM Peak		SB HOV	B	E	Yes	None - Meets LOS Standard
8	3E	US-101	Mission Ave	N. San Pedro Rd	Freeway	NB	C	SB	D	E	Yes	None - Meets LOS Standard
						No NB HOV lane in AM Peak		SB HOV	B	E	Yes	None - Meets LOS Standard
7	3F	US-101	Frietas Pkwy	Lucas Valley Rd	Freeway	NB	A	SB	E	E	Yes	None - Meets LOS Standard
						No NB HOV lane in AM Peak		SB HOV	E	E	Yes	None - Meets LOS Standard
2	3G	US-101	Atherton Ave	Sonoma County Line	Freeway	NB	A	SB	B	E	Yes	None - Meets LOS Standard
14	5B	I-580	Sir Francis Drake Blvd	Bellam Blvd	Freeway	EB	C	WB	C	E	Yes	None - Meets LOS Standard
6	7A	Ignacio Blvd	US-101	Commercial Blvd	Arterial	EB	B	WB	A	D	Yes	None - Meets LOS Standard
22	8A	Sir Francis Drake Blvd	Willow Ave	Butterfield Rd	Arterial	EB	C	WB	C	D	Yes	None - Meets LOS Standard
9	8B	Sir Francis Drake Blvd	San Anselmo Ave	Red Hill Ave	Arterial	EB	C	WB	C	D	Yes	None - Meets LOS Standard
23	8C	Sir Francis Drake Blvd	Toussin Ave	College Ave	Arterial	EB	D	WB	B	D	Yes	None - Meets LOS Standard
12	8D	Sir Francis Drake Blvd	College Ave	Wolfe Grade	Arterial	EB	A	WB	A	D	Yes	None - Meets LOS Standard
16	8E	Sir Francis Drake Blvd	US-101	Larkspur Landing Circle	Arterial	EB	C	WB	D	D	Yes	None - Meets LOS Standard

¹ 2nd Street from Marquard Avenue to US-101 is a one-way street EB only

² 3rd Street from US-101 to Marquard Avenue is a one-way street WB only

Note: Locations below the appropriate LOS thresholds are identified in **BOLD**. Locations identified as needing an improvement plan are highlighted as well.

Table 12: Action Required for each Roadway Segment in the PM Peak Hour

Old Segment ID #	New #	Street	From	To	Roadway Type	Northbound / Eastbound		Southbound / Westbound		LOS Standard	Grandfathered Status	Required Action
						Direction	LOS Result	Direction	LOS Result			
No Action Required - Grandfathered and Fails LOS Standard												
17	3B	US-101	Tiburon Blvd (SR-131)	Tamalpais Dr	Freeway	NB	F	SB	D	E	Yes	None - Grandfathered In
						NB HOV	F	No SB HOV in PM Peak		E	Yes	None - Grandfathered In
No Action Required - Non-Grandfathered and Meets LOS Standard												
25	1A	Shorline Hwy (SR-1)	US-101	Tennessee Valley	Arterial	NB	B	SB	C	D	No	None - Meets LOS Standard
1	1C	Shoreline Hwy (SR-1)	Sir Francis Drake Blvd	Pt Reyes	Arterial	NB	A	SB	A	D	No	None - Meets LOS Standard
5	2A	SR-37	US-101	Atherton Ave	Freeway	EB	A	WB	A	E	No	None - Meets LOS Standard
21	3A	US-101	N. of GGB	Spencer Ave	Freeway	NB	E	SB	E	E	No	None - Meets LOS Standard
18	4A	Tiburon Blvd (SR-131)	Redwood Frontage Rd	Strawberry Dr	Arterial	EB	A	WB	A	D	No	None - Meets LOS Standard
15	5A	I-580	End of Richmond-San Rafael Bridge	Sir Francis Drake Blvd	Freeway	EB	E	WB	C	E	No	None - Meets LOS Standard
3	6A	Novato Blvd	San Marin Dr	Eucalyptus Dr	Arterial	NB	B	SB	A	D	No	None - Meets LOS Standard
24	6B	Novato Blvd	Wilson Ave	Diablo Ave	Arterial	NB	B	SB	B	D	No	None - Meets LOS Standard
4	6C	S. Novato Blvd	Sunset Pkwy	US-101	Arterial	NB	B	SB	A	D	No	None - Meets LOS Standard
10	9A	Red Hill Ave	Sir Francis Drake Blvd	Hilldale Dr	Arterial	EB	A	WB	C	D	No	None - Meets LOS Standard
26	9B	2nd St ¹	Marquard Ave/4th St	US-101	Arterial	EB	C	One-way Street		D	No	None - Meets LOS Standard
27	9C	3rd St ²	US-101	Marquard Ave/4th St	Arterial	One-way Street		WB	C	D	No	None - Meets LOS Standard
20	10A	Bridgeway Blvd	Gate 5 Rd	Gate 6 Rd	Arterial	NB	C	SB	A	D	No	None - Meets LOS Standard
No Action Required - Grandfathered and Meets LOS Standard												
19	1B	Shorline Hwy (SR-1)	Northern Ave	Almonte Blvd	Arterial	NB	A	SB	B	D	Yes	None - Meets LOS Standard
13	3C	US-101	Sir Francis Drake Blvd	I-580	Freeway	NB	D	SB	C	E	Yes	None - Meets LOS Standard
						NB HOV	D	No SB HOV in PM Peak		E	Yes	None - Meets LOS Standard
11	3D	US-101	I-580	Mission Ave	Freeway	NB	D	SB	C	E	Yes	None - Meets LOS Standard
						NB HOV	D	No SB HOV in PM Peak		E	Yes	None - Meets LOS Standard
8	3E	US-101	Mission Ave	N. San Pedro Rd	Freeway	NB	D	SB	E	E	Yes	None - Meets LOS Standard
						NB HOV	C	No SB HOV in PM Peak		E	Yes	None - Meets LOS Standard
7	3F	US-101	Frietas Pkwy	Lucas Valley Rd	Freeway	NB	B	SB	A	E	Yes	None - Meets LOS Standard
						NB HOV	B	No SB HOV in PM Peak		E	Yes	None - Meets LOS Standard
2	3G	US-101	Atherton Ave	Sonoma County Line	Freeway	NB	E	SB	A	E	Yes	None - Meets LOS Standard
14	5B	I-580	Sir Francis Drake Blvd	Bellam Blvd	Freeway	EB	E	WB	C	E	Yes	None - Meets LOS Standard
6	7A	Ignacio Blvd	US-101	Commercial Blvd	Arterial	EB	A	WB	B	D	Yes	None - Meets LOS Standard
22	8A	Sir Francis Drake Blvd	Willow Ave	Butterfield Rd	Arterial	EB	A	WB	C	D	Yes	None - Meets LOS Standard
9	8B	Sir Francis Drake Blvd	San Anselmo Ave	Red Hill Ave	Arterial	EB	C	WB	B	D	Yes	None - Meets LOS Standard
23	8C	Sir Francis Drake Blvd	Toussin Ave	College Ave	Arterial	EB	D	WB	C	D	Yes	None - Meets LOS Standard
12	8D	Sir Francis Drake Blvd	College Ave	Wolfe Grade	Arterial	EB	A	WB	B	D	Yes	None - Meets LOS Standard
16	8E	Sir Francis Drake Blvd	US-101	Larkspur Landing Circle	Arterial	EB	C	WB	D	D	Yes	None - Meets LOS Standard

¹ 2nd Street from Marquard Avenue to US-101 is a one-way street EB only

² 3rd Street from US-101 to Marquard Avenue is a one-way street WB only

Note: Locations below the appropriate LOS thresholds are identified in **BOLD**. Locations identified as needing an improvement plan are highlighted as well.



5.0 TRANSIT SERVICES

Transit services within Marin County are provided by multiple providers depending on the purpose of the trip. Marin County Transit District (Marin Transit) provides local transit within Marin County alone. Golden Gate Transit provides regional bus service to Marin County residents and neighboring counties in Sonoma County, San Francisco County, and Contra Costa County. Ferry service is also provided by Golden Gate Ferry Service, Blue and Gold Fleet, and Angel Island Tiburon Ferry.

5.1 Marin Transit

Local transit service is provided by the Marin County Transit District. Marin Transit provides multiple transit services to the County: local routes, West Marin stagecoach, Muir Woods shuttle, school routes, shuttle service, Novato Dial-a-Ride, paratransit, and wheelchair accessible taxis. **Table 13** shows the routes that Marin Transit services and the frequency that the routes operate, or the headways.

Table 13: Marin Transit Bus Routes

Route #	Type	From	To	Headways
17	Local Route	San Rafael Transit Center	Sausalito and Tiburon	30-60 min
19	Local Route	Tiburon	Marin City	50-60 min
22	Local Route	San Rafael Transit Center	Sausalito	30-60 min
23	Local Route	San Rafael Transit Center	White Hill Middle School	60 min
29	Local Route	San Rafael Transit Center	Sir Francis Drake Blvd & Olema Rd	30-60 min
35	Local Route	San Rafael Transit Center	Golden Gate Transit	5-30 min
36	Local Route	San Rafael Transit Center	Marin City	30-60 min
45	Local Route	San Rafael Transit Center	Kaiser Hospital	30 min
49	Local Route	San Rafael Transit Center	San Marin Dr & San Andreas Dr	60 min
51	Local Route	San Marin Dr & San Andreas Dr	Hamilton Pkwy & Chapel Hill Rd	30-60 min
61	West Marin Stagecoach	Sausalito	Shoreline Hwy & Sir Francis Drake Blvd	65-267 min
66	Muir Woods Shuttle	Muir Woods	Sausalito	20-30 min
68	West Marin Stagecoach	San Rafael Transit Center	Inverness	50 – 220 min
71	Local Route	Marin City	Novato	26-154 min
113	School Route	Redwood High School	Paradise Cay	7:30 AM, 2 runs; 2:45 PM, 4 runs
117	School Route	Neil Cummins School	Ease Corte Madera	7:47 AM, 3 runs; 3:02 PM, 4 runs
125	School Route	Lagunitas School	Drake High School	3:28 PM, 1 run
126	School Route	San Domenico School	San Rafael	7:51 AM, 2 runs; 2:00 PM, 4 runs
127	School Route	White Hill School	Sleepy Hollow	6:57 AM, 4 runs; 2:27 PM, 2 runs
139	School Route	Terra Linda High School	Lucas Valley	7:12 AM, 2 runs; 3:30 PM, 1 run



Route #	Type	From	To	Headways
222	Shuttle	Marin City	Greenbrae	26 – 106 min
233	Shuttle	San Rafael Transit Center	Santa Venetia	60 min
257	Shuttle	San Rafael Transit Center	Contempo	60 min
259	Shuttle	San Rafael Transit Center	Marinwood	60 min
Novato Dial-a-ride	Special Services	Novato		Call for pick-up
Paratransit	Special Services	Marin County		Call for pick-up
Wheelchair Accessible Taxis	Special Services	Marin County		Call for pick-up

5.2 Golden Gate Transit

Intercounty transit is provided by the Golden Gate Transit. Golden Gate Transit provides both basic and commute bus service. **Table 14** shows the bus routes that Golden Gate Transit services and each route’s headways.

Table 14: Golden Gate Transit Bus Routes

Route #	Type	From	To	Headways
2	Commute	Marin Headlands	San Francisco	15-35 min
4	Commute	Mill Valley	San Francisco	5-37 min
8	Commute	Tiburon	San Francisco	51 min
10	Basic	Tam Valley	San Francisco	30-60 min
18	Commute	Kentfield	San Francisco	9-32 min
24	Commute	Manor	San Francisco	10-74 min
27	Commute	Sleepy Hollow	San Francisco	5-91 min
38	Commute	Terra Linda	San Francisco	30 min
40/42	Basic	El Cerrito Del Norte BART Station	San Rafael Transit Center	30-60 min
42	Basic	El Cerrito Del Norte BART Station	San Rafael Transit Center	60 min
44	Commute	Marinwood	San Francisco	60 min
54	Commute	Novato	San Francisco	9-30 min
56	Commute	Novato	San Francisco	20-30 min
58	Commute	Novato	San Francisco	25-36 min
70/71/80	Basic	Santa Rosa	San Francisco	3-60 min
72	Commute	Santa Rosa	San Francisco	21-60 min
74	Commute	Cotati	San Francisco	30-60 min
76	Commute	East Petaluma	San Francisco	30-60 min
92	Commute	Marin City	San Francisco	30-60 min
93	Commute	Golden Gate Bridge	San Francisco	10-30 min
97	Commute	Larkspur Ferry Terminal	San Francisco	5:22 AM, 1 run
101	Basic	Santa Rosa	San Francisco	25-60 min



5.3 Ferry Service

Ferry service is provided by multiple providers including Golden Gate Ferry Service, Blue and Gold Fleet, and Angel Island Tiburon Ferry. The Golden Gate Ferry offers three separate ferry routes:

1. The Larkspur Ferry operates weekdays and weekends/holidays. The weekday ferry runs from 5:50 AM to 10:05 PM on 30-85 minute headways and the weekend ferry runs from 9:40 AM to 8:10 PM on 120-185 min headways. This ferry transports people from Larkspur to the San Francisco Ferry Building.
2. The Sausalito Ferry operates weekdays and weekends/holidays. The weekday ferry runs from 7:10 AM to 8:20 PM on 70-155 minute headways and the weekend ferry runs from 10:40 AM to 7:15 PM on 80-110 min headways. This ferry transports people from Sausalito to the San Francisco Ferry Building.
3. The San Francisco Giants Game Ferry operates on game days. This ferry runs until 30 minutes after the final out of the ballgame and runs about 60 minutes each way. The ferry goes between Larkspur and AT&T Park.

The Blue and Gold Fleet Ferry offers three separate ferry routes:

1. The Sausalito Ferry operates weekdays and weekends/holidays. The weekday ferry runs from 11:20 AM to 8:45 PM on 70-110 minute headways and the weekend ferry runs from 9:45 AM to 6:55 PM on 70-170 min headways. This ferry transports people from Sausalito to Pier 41 in San Francisco.
2. The Tiburon Ferry operates weekdays and weekends/holidays. The weekday ferry runs from 10:10 AM to 8:45 PM on 70-145 minute headways and the weekend ferry runs from 9:45 AM to 6:55 PM on 95-145 min headways. This ferry transports people from Tiburon to Pier 41 in San Francisco. There is also a Tiburon commute ferry that operates on weekdays from 5:35 AM to 8:00 PM and runs on 55-70 min headways.
3. The Angel Island Ferry operates weekdays and weekends/holidays. The weekday ferry runs from 10:10 AM to 3:20 PM with two trips per day and the weekend ferry runs from 9:45 AM to 5:20 PM with two trips per day. This ferry transports people from Angel Island to Pier 41 in San Francisco.

The Angel Island Tiburon Ferry operates on weekdays and weekends with different schedules year-round. The ferry runs from 10:00 AM to 5:20 PM in the peak summer season on 60 min headways.

5.4 Transit Ridership

Transit in Marin County is a popular means of transportation both for commuting and recreationally. Increased multi-modal and transit usage is a goal of the County and the Bay Area and therefore is measured. Transit ridership has been observed since 2006 to determine the effectiveness of the services provided. **Table 15** shows the transit ridership trends for each transit service since 2006.



Table 15: Transit Ridership in Marin

Fiscal Year	Annual Revenue Hours	Annual Boardings
Golden Gate Basic and Commuter Service		
2006-07	181,866	3,966,705
2007-08	186,959	4,050,191
2008-09	185,589	3,918,720
2009-10	181,915	3,382,098
2010-11	175,945	3,398,098
2011-12	210,741	3,513,639
Golden Gate Ferry Service		
2006-07	9,503	2,024,935
2007-08	9,854	1,980,010
2008-09	9,632	1,949,035
2009-10	8,583	1,922,095
2010-11	9,488	2,031,219
2011-12	13,498	2,195,414
Marin Transit Sponsored Local Service		
2006-07	110,608	3,216,243
2007-08	113,554	3,259,037
2008-09	122,907	3,189,321
2009-10	121,875	3,085,480
2010-11	115,236	3,113,544
2011-12	111,634	3,066,487
Marin Transit Shuttles and West Marin Routes (including Novato Dial-A-Ride)		
2006-07	13,743	78,827
2007-08	17,828	120,541
2008-09	21,558	141,899
2009-10	22,989	142,004
2010-11	21,964	153,993
2011-12	25,058	199,541
Marin Access Paratransit (formerly Whistlestop Wheels)		
2006-07	43,982	96,157
2007-08	45,390	99,064
2008-09	46,968	99,808
2009-10	48,322	105,669
2010-11	61,656	118,097
2011-12	64,630	125,652

Source: 2011 Marin Congestion Management Program, System Performance Summary for FY 2011/12

The Golden Gate Transit Basic and Commuter Service has seen a general trend of decreased annual revenue hours since 2007. This trend has reversed in 2011-2012 with the highest annual revenue hours in the past six years with approximately 210,000 revenue hours. This is a result of increased annual boardings as compared to the previous two years.

The Golden Gate Ferry Service has seen a general trend of increased annual revenue hours over the last two years. This trend has continued in 2011-2012 with the highest annual revenue hours in the past six years with approximately 13,500 revenue hours. This is an increase of



approximately 40% from the previous fiscal year. The annual boardings are also at its highest number in the last six years.

The Marin Transit Sponsored Local Service has seen a general trend of decreased annual revenue hours over the past four years. This trend has continued in 2011-2012 with the lowest annual revenue hours in the past five years with approximately 111,600 revenue hours. This is a result of decreased annual boardings over the last six years to approximately 3,000,000 boardings.

The Marin Transit Shuttles and West Marin Routes Service (including Novato Dial-a-Ride) has seen a general trend of increased annual revenue hours over the past six years. This trend has continued in 2011-2012 with the highest annual revenue hours in the past six years with approximately 25,000 revenue hours. This is a result of increased annual boardings over the last six years to approximately 200,000 boardings.

The Marin Access Paratransit Service (formerly known as Whistlestop Wheels) has seen a general trend of increased annual revenue hours over the past six years. This trend has continued in 2011-2012 with the highest annual revenue hours in the past six years with approximately 65,000 revenue hours. This is a result of increased annual boardings over the last six years to approximately 125,000 boardings.

In general, the transit service in Marin County has seen increased annual revenue hours and boardings on all the transit services except for the Marin Transit Sponsored Local service in 2011-12.



6.0 BICYCLE AND PEDESTRIAN ACTIVITY

Bicycle and pedestrian activity was monitored at various locations in Marin County that were previously studied in the Nonmotorized Transportation Pilot Program's *Summary of 2007, 2008, 2009, 2010, and 2011 Bicycle and Pedestrian Counts and Surveys*⁴. However the bicycle and pedestrian monitoring is not required for the CMP and is therefore presented for informational purposes only. Bicycle and pedestrian volumes were collected at most locations in the AM peak (7-9), PM peak (4-6), and weekend midday peak (12-2). The volumes surveyed were further categorized into different attributes, such as male or female, children, bicyclists not wearing a helmet, and bicyclists going the wrong way. The total pedestrian and bicycle volume counts were then compared to previous year's data. It should be noted that no counts were collected in 2012 on Doherty Drive at Hall Middle School in Larkspur due to a construction closure.

6.1 2012 Bicycle and Pedestrian Volumes

Bicycle and pedestrian activity was monitored and is represented in **Table 16**. Pedestrian and bicyclist volumes are reported for the entire tow hour period, not just for the peak hour. At location #11 (Tiburon Bike Path at Blackie's Pasture in Tiburon) and location #19 (Sir Francis Drake at Wolfe Grade in Kentfield) four hours of data was collected (2-6PM). Therefore the peak tow hours are reported to be comparable to the other locations that only collected two hours. As shown in **Table 16**, at the 23 locations collected, there was a wide range in the number of pedestrians and bicyclists at each location.

Overall the number of pedestrians peaked in the PM and weekend midday peak hours with 4,405 and 4,465 pedestrians, respectively. For bicyclists, the weekday AM and PM peak hours had similar volume counts with 1721 and 1766 bicyclists, respectively. However, there were many more bicyclists during the weekend midday peak period with 4,078 bicyclists.

The maximum number of pedestrians counted in the AM peak was at the intersection of Medway Road and Belvedere Street in San Rafael with 437 pedestrians crossing the southwest leg of Medway Road in the two-hour period. The least number of pedestrians counted in the AM peak was at the intersection of Anderson Drive at the Cal Park tunnel path in San Rafael with 9 pedestrians crossing the tunnel path in the two-hour period. The maximum number of pedestrians counted in the PM peak was at the intersection of 4th Street and B Street in San Rafael with 730 pedestrians crossing the west leg of 4th Street in the two-hour period. The least number of pedestrians counted in the PM peak was at the intersection of Anderson Drive at the Cal Park tunnel path in San Rafael with zero pedestrians crossing the tunnel path in the two-hour period. The maximum number of pedestrians counted in the weekend midday peak was at the intersection of Tiburon Boulevard and Main Street in Tiburon with 599 pedestrians crossing the east leg of Tiburon Boulevard in the two-hour period. The least number of pedestrians counted in the weekend midday peak was at the intersection of Ranchitos Road and Puerto Suello Summit in San Rafael with zero pedestrians in the two-hour period.

⁴ *Summary of 2007, 2008, 2009, 2010, and 2011 Bicycle and Pedestrian Counts and Surveys*, Alta Planning + Design, November 2011.



The maximum number of bicyclists counted in the AM peak was at the intersection of Mill Valley-Sausalito Path and Tennessee Valley Path Junction with 203 bicyclists in the two-hour period. The least number of bicyclists counted in the AM peak was at the intersection of Alameda Del Prado and Nave Drive in Novato with four bicyclists crossing the east leg on Nave Drive in the two-hour period. The maximum number of bicyclists counted in the PM peak was at the intersection of Mill Valley-Sausalito Path and Tennessee Valley Path Junction with 259 bicyclists in the two-hour period. The least number of bicyclists counted in the PM peak was at the intersection of Alameda Del Prado and Nave Drive in Novato with four bicyclists crossing the east leg on Nave Drive in the two-hour period, similar to the AM peak. The maximum number of bicyclists counted in the weekend midday peak was at the Mill Valley-Sausalito Path and East Blithedale Avenue in Mill Valley with 655 bicyclists in the two-hour period. The least number of bicyclists counted in the weekend midday peak was at the intersection of Medway Road and Belvedere Street in San Rafael with 11 bicyclists crossing the southwest leg in the two-hour period.

Additional pedestrian and bicyclist volume attribute trends by location are shown **Table 17**. For pedestrians, the male to female ratio was approximately 50:50 for all locations combined. Roughly 14% of the pedestrians for all locations combined were children (pedestrians estimated to be less than 18 years old). For bicyclists, 70% of the riders were male and 30% were female for all locations combined. And 11% of all riders for all locations combined were children. Other attributes included in the survey showed that 15% of bicyclists were not wearing a helmet and 19% of the riders were traveling the wrong way for all locations combined.



Table 16: 2012 Pedestrian and Bicyclist Two-Hour Count Volumes for Weekdays and Weekends

ID	Streets	Weather Conditions	AM Peak 2 Hours (7-9 AM)			PM Peak 2 Hours (4-6 PM)			Weekend Midday Peak 2 Hours (12-2 PM)		
			Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total	Pedestrians	Bicyclists	Total
1	Tiburon Blvd at Main Street, Tiburon	Sunny and Dry	237	44	281	466	96	562	599	248	847
2	Miller Ave. at Throckmorton, Mill Valley	Sunny and Dry	243	181	424	433	209	642	589	102	691
3	4th and B St., San Rafael	Sunny and Dry	151	32	183	730	68	798	57	62	119
4	Bridgeway at Princess St., Sausalito	Sunny and Dry	187	187	374	1120	360	1480	1663	491	2154
5	San Anselmo Ave at Tunstead Ave., San Anselmo	Sunny and Dry	75	125	200	321	82	403	560	423	983
6	Broadway at Bolinas Rd., Fairfax	Sunny and Dry	157	135	292	300	110	410	356	526	882
7	Grant Ave. at Redwood Blvd., Novato	Sunny and Dry	81	62	143	410	111	521	384	23	407
8	Magnolia Ave. at Ward St., Larkspur	Sunny and Dry	95	64	159	178	31	209	240	325	565
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	Sunny and Dry	97	140	237	137	196	333	56	655	711
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	Sunny and Dry	123	203	326	146	259	405	131	477	608
11	Tiburon Bike Path at Blackie's Pasture, Tiburon ¹	Sunny and Dry	117	60	177	108	52	160	221	213	434
12	Larkspur-Corte Madera Path at Baltimore Wye	Sunny and Dry	91	64	155	59	56	115	57	80	137
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	Sunny and Dry	43	65	108	53	33	86	63	73	136
14	Medway Rd. at Belvedere St., San Rafael	Sunny and Dry	437	46	483	374	67	441	416	11	427
15	Camino Alto at E. Blithedale, Mill Valley	Sunny and Dry	23	20	43	15	23	38	28	143	171
16	Alameda Del Prado at Nave Drive, Novato	Sunny and Dry	14	4	18	33	4	37	25	46	71
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	Sunny and Dry	10	38	48	10	41	51	0	117	117
18	Doherty Dr. at Hall Middle School, Larkspur ²	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Sir Francis Drake at Wolfe Grade, Kentfield ¹	Sunny and Dry	112	55	167	116	81	197	44	58	102
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	Sunny and Dry	9	46	55	0	53	53	4	92	96
21	South Novato Blvd. at Rowland, Novato	Sunny and Dry	29	32	61	25	6	31	42	36	78
22	Bellam at Andersen, San Rafael	Sunny and Dry	222	118	340	206	108	314	53	52	105
23	Nicasio Valley Road near Nicasio School, Nicasio ³	Sunny and Dry	N/A	N/A	N/A	N/A	N/A	N/A	3	51	54
	Total		2553	1721	4274	5240	2046	7286	5591	4304	9895
	Average Count per Location		122	82	204	250	97	347	254	196	450

¹ PM Counts were collected from 2-6 PM and the highest consecutive 2 hours were reported

² No counts were collected on Doherty Drive due to a construction closure

³ No weekday counts were collected on Nicasio Valley Road



Table 17: 2012 Two-Hour Pedestrian and Bicyclist Volumes & Attributes: Gender, Age, and Helmet Use

ID	Streets	Pedestrians				Bicyclists					
		Male	Female	Children	Total	Male	Female	Children	Total	No Helmet	Wrong Way
1	Tiburon Blvd at Main Street, Tiburon	689	613	124	1302	295	93	18	388	57	3
2	Miller Ave. at Throckmorton, Mill Valley	608	657	136	1265	289	203	65	492	40	26
3	4th and B St., San Rafael	578	360	84	938	116	46	33	162	90	279
4	Bridgeway at Princess St., Sausalito	1313	1657	86	2970	755	283	35	1038	209	1016
5	San Anselmo Ave at Tunstead Ave., San Anselmo	430	526	134	956	442	188	30	630	83	48
6	Broadway at Bolinas Rd., Fairfax	405	408	156	813	519	252	72	771	112	10
7	Grant Ave. at Redwood Blvd., Novato	459	416	74	875	122	74	39	196	21	25
8	Magnolia Ave. at Ward St., Larkspur	213	300	122	513	328	92	32	420	17	14
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	120	170	65	290	732	259	105	991	61	0
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	161	239	56	400	655	284	39	939	101	0
11	Tiburon Bike Path at Blackie's Pasture, Tiburon ¹	176	270	63	446	214	111	46	325	31	69
12	Larkspur-Corte Madera Path at Baltimore Wye	65	142	49	207	118	82	105	200	30	0
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	50	109	25	159	104	67	27	171	14	4
14	Medway Rd. at Belvedere St., San Rafael	713	514	273	1227	82	42	45	124	96	58
15	Camino Alto at E. Blithedale, Mill Valley	21	45	18	66	118	68	26	186	22	6
16	Alameda Del Prado at Nave Drive, Novato	38	34	6	72	38	16	2	54	1	1
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	12	8	9	20	154	42	5	196	21	56
18	Doherty Dr. at Hall Middle School, Larkspur ²	N/A	N/A	N/A	0	N/A	N/A	N/A	0	N/A	N/A
19	Sir Francis Drake at Wolfe Grade, Kentfield ¹	104	168	169	272	97	97	65	194	14	3
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	11	2	0	13	146	45	16	191	26	0
21	South Novato Blvd. at Rowland, Novato	57	39	15	96	51	23	7	74	22	2
22	Bellam at Andersen, San Rafael	377	104	26	481	232	46	2	278	132	10
23	Nicasio Valley Road near Nicasio School, Nicasio ³	1	2	1	3	32	19	0	51	0	0
	Total	6601	6783	1691	13384	5639	2432	814	8071	1200	1630
	Average Count per Location	300	308	77	582	256	111	37	351	55	74

¹ PM Counts were collected from 2-6 PM and the highest consecutive 2 hours were reported

² No counts were collected on Doherty Drive due to a construction closure

³ No weekday counts were collected on Nicasio Valley Road



6.2 Historical Bicycle and Pedestrian Volume Trends

Bicycle and pedestrian activity was monitored and compared to previous year's data for historical trends. Weekday pedestrian peak hour data is shown in **Table 18**. As shown in **Table 18**, the average pedestrian volume per count location is 145 pedestrians per location in 2012. This is a 3% decrease from 2011, but a 104% increase from 1999. In general, the pedestrian volume has slightly increased from year to year from 2007 to 2010, with a higher increase to 2011 and then holding steady to 2012.

Weekend pedestrian peak hour data is shown in **Table 19**. As shown in **Table 19**, the average pedestrian volume per count location is 144 pedestrians per location in 2012. This is a 23% decrease from 2011 and a 43% decrease from 1999. In general, the pedestrian volume has stayed roughly the same from 2008 to 2011 and has dropped off by 22 pedestrians compared to the 1999-2011 average. However, looking at the data more closely, location #3 (4th Street and B Street) shows a much lower volume in 2012 than in previous years. If this location is removed from the average, then the 2012 volumes are higher than the 1999-2011 average, but still lower than the 2011 volumes.

Weekday bicyclist peak hour data is shown in **Table 20**. As shown in **Table 20**, the average bicyclist volume per count location is 52 bicyclists per location. This is a 24% decrease from 2011 and but a 2% increase from the 1999-2011 average. In general, the bicyclist volume has slightly increased from year to year, but dropped off in 2012 to year 2008 levels.

Weekend bicyclist peak hour data is shown in **Table 21**. As shown in **Table 21**, the average bicyclist volume per count location is 112 bicyclists per location. This is an 11% decrease from 2011 but a 13% increase from the 1999-2011 average. In general, the bicyclist volume has steadily increased from 2007 to 2011, but has dropped off in 2012. However, looking at the data more closely, location #14 (Medway Road and Belvedere Street) shows a much lower volume in 2012 than in previous years. If this location is removed from the average, then the 2012 volumes are roughly the same as the 2010 volumes.

In **Tables 18 to 21**, volumes highlighted in yellow identify volumes that were abnormally high or low in 2012 compared to volumes from previous years at that particular location. It should be noted that the abnormally high or low volumes were not necessarily a trend for both weekdays and weekends or for both pedestrians and bicyclists.

Table 18: Weekday Peak-Hour Pedestrian Counts and Percent Change, 1999-2012

ID	Streets	Counts								Percent Change Between Count Year and 2012						
		1999	2007	2008	2009	2010	2011	1999-2011 Avg	2012	1999	2007	2008	2009	2010	2011	1999-2011 Avg
1	Tiburon Blvd at Main Street, Tiburon	N/A	269	134	226	161	82	174	234	N/A	-13%	75%	4%	45%	185%	34%
2	Miller Ave. at Throckmorton, Mill Valley	N/A	95	161	162	230	254	180	227	N/A	139%	41%	40%	-1%	-11%	26%
3	4th and B St., San Rafael	N/A	669	147	390	258	317	356	312	N/A	-53%	112%	-20%	21%	-2%	-12%
4	Bridgeway at Princess St., Sausalito	57	348	514	394	520	506	390	696	1121%	100%	35%	77%	34%	38%	78%
5	San Anselmo Ave at Tunstead Ave., San Anselmo	238	122	66	140	129	181	146	228	-4%	87%	245%	63%	77%	26%	56%
6	Broadway at Bolinas Rd., Fairfax	107	74	178	121	166	252	150	187	75%	153%	5%	55%	13%	-26%	25%
7	Grant Ave. at Redwood Blvd., Novato	71	52	69	184	95	98	95	237	234%	356%	243%	29%	149%	142%	149%
8	Magnolia Ave. at Ward St., Larkspur	N/A	84	105	123	119	125	111	97	N/A	15%	-8%	-21%	-18%	-22%	-13%
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	36	38	41	26	42	86	45	78	117%	105%	90%	200%	86%	-9%	73%
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	52	20	54	40	15	33	36	106	104%	430%	96%	165%	607%	221%	194%
11	Tiburon Bike Path at Blackie's Pasture, Tiburon ¹	54	84	164	78	115	117	102	92	70%	10%	-44%	18%	-20%	-21%	-10%
12	Larkspur-Corte Madera Path at Baltimore Wye	90	64	42	51	60	51	60	31	-66%	-52%	-26%	-39%	-48%	-39%	-48%
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	90	35	48	35	46	N/A	51	44	-51%	26%	-8%	26%	-4%	N/A	N/A
14	Medway Rd. at Belvedere St., San Rafael	N/A	244	319	324	377	322	317	214	N/A	-12%	-33%	-34%	-43%	-34%	-32%
15	Camino Alto at E. Blithedale, Mill Valley	N/A	35	13	15	67	112	48	10	N/A	-71%	-23%	-33%	-85%	-91%	-79%
16	Alameda Del Prado at Nave Drive, Novato	N/A	7	15	7	20	29	16	22	N/A	214%	47%	214%	10%	-24%	38%
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	2	14	1	4	11	78	18	8	300%	-43%	700%	100%	-27%	-90%	-56%
18	Doherty Dr. at Hall Middle School, Larkspur ²	N/A	38	46	161	44	387	135	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Sir Francis Drake at Wolfe Grade, Kentfield ¹	9	25	13	17	59	42	28	61	578%	144%	369%	259%	3%	45%	118%
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	N/A	11	19	31	26	23	22	0	N/A	-100%	-100%	-100%	-100%	-100%	-100%
21	South Novato Blvd. at Rowland, Novato	N/A	39	N/A	9	82	29	40	16	N/A	-59%	N/A	78%	-80%	-45%	-60%
22	Bellam at Andersen, San Rafael	42	39	N/A	9	14	30	27	154	267%	295%	N/A	1611%	1000%	413%	470%
23	Nicasio Valley Road near Nicasio School, Nicasio ³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Average Count per Location	71	109	107	116	121	150	112	145	104%	33%	36%	25%	20%	-3%	29%

¹ PM Counts were collected from 2-6 PM and the highest consecutive 2 hours were reported

² No counts were collected on Doherty Drive due to a construction closure

³ No weekday counts were collected on Nicasio Valley Road

Table 19: Weekend Peak-Hour Pedestrian Counts and Percent Change, 1999-2012

ID	Streets	Counts								Percent Change Between Count Year and 2012						
		1999	2007	2008	2009	2010	2011	1999-2011 Avg	2012	1999	2007	2008	2009	2010	2011	1999-2011 Avg
1	Tiburon Blvd at Main Street, Tiburon	770	564	187	238	200	394	392	332	-57%	-41%	78%	39%	66%	-16%	-15%
2	Miller Ave. at Throckmorton, Mill Valley	552	258	328	270	371	478	376	300	-46%	16%	-9%	11%	-19%	-37%	-20%
3	4th and B St., San Rafael	510	770	762	385	448	501	563	44	-91%	-94%	-94%	-89%	-90%	-91%	-92%
4	Bridgeway at Princess St., Sausalito	190	303	1388	1782	1676	1055	1066	890	368%	194%	-36%	-50%	-47%	-16%	-17%
5	San Anselmo Ave at Tunstead Ave., San Anselmo	450	222	60	194	258	394	263	307	-32%	38%	412%	58%	19%	-22%	17%
6	Broadway at Bolinas Rd., Fairfax	146	125	276	124	121	205	166	204	40%	63%	-26%	65%	69%	0%	23%
7	Grant Ave. at Redwood Blvd., Novato	133	111	61	96	187	79	111	219	65%	97%	259%	128%	17%	177%	97%
8	Magnolia Ave. at Ward St., Larkspur	120	102	114	133	48	195	119	170	42%	67%	49%	28%	254%	-13%	43%
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	N/A	19	39	28	29	33	30	31	N/A	63%	-21%	11%	7%	-6%	3%
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	14	48	40	55	52	53	44	76	443%	58%	90%	38%	46%	43%	73%
11	Tiburon Bike Path at Blackie's Pasture, Tiburon ¹	50	75	97	145	166	267	133	148	196%	97%	53%	2%	-11%	-45%	11%
12	Larkspur-Corte Madera Path at Baltimore Wye	10	33	44	59	33	52	39	29	190%	-12%	-34%	-51%	-12%	-44%	-26%
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	75	26	37	47	25	N/A	42	42	-44%	62%	14%	-11%	68%	N/A	0%
14	Medway Rd. at Belvedere St., San Rafael	N/A	198	279	258	247	256	248	257	N/A	30%	-8%	0%	4%	0%	4%
15	Camino Alto at E. Blithedale, Mill Valley	N/A	15	12	6	9	8	10	22	N/A	47%	83%	267%	144%	175%	120%
16	Alameda Del Prado at Nave Drive, Novato	N/A	11	8	11	14	12	11	16	N/A	45%	100%	45%	14%	33%	45%
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	N/A	20	1	4	5	11	8	0	N/A	-100%	-100%	-100%	-100%	-100%	-100%
18	Doherty Dr. at Hall Middle School, Larkspur ²	N/A	30	26	13	8	30	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Sir Francis Drake at Wolfe Grade, Kentfield ¹	N/A	15	8	5	5	26	12	25	N/A	67%	213%	400%	400%	-4%	108%
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	N/A	21	24	10	71	32	32	3	N/A	-86%	-88%	-70%	-96%	-91%	-91%
21	South Novato Blvd. at Rowland, Novato	N/A	13	N/A	6	7	8	9	25	N/A	92%	N/A	317%	257%	213%	178%
22	Bellam at Andersen, San Rafael	N/A	20	N/A	34	31	31	29	30	N/A	50%	N/A	-12%	-3%	-3%	3%
23	Nicasio Valley Road near Nicasio School, Nicasio	N/A	N/A	N/A	N/A	2	10	6	3	N/A	N/A	N/A	N/A	50%	-70%	-50%
	Average Count per Location	252	136	190	177	174	188	186	144	-43%	6%	-24%	-19%	-17%	-23%	-23%

¹ PM Counts were collected from 2-6 PM and the highest consecutive 2 hours were reported

² No counts were collected on Doherty Drive due to a construction closure

Table 20: Weekday Peak-Hour Bicycle Counts and Percent Change, 1999-2012

ID	Streets	Counts								Percent Change Between Count Year and 2012						
		1999	2007	2008	2009	2010	2011	1999-2011 Avg	2012	1999	2007	2008	2009	2010	2011	1999-2011 Avg
1	Tiburon Blvd at Main Street, Tiburon	N/A	64	54	84	40	76	64	53	N/A	-17%	-2%	-37%	33%	-30%	-17%
2	Miller Ave. at Throckmorton, Mill Valley	N/A	23	37	36	38	36	34	12	N/A	-48%	-68%	-67%	-68%	-67%	-65%
3	4th and B St., San Rafael	N/A	31	19	35	43	33	32	21	N/A	-32%	11%	-40%	-51%	-36%	-34%
4	Bridgeway at Princess St., Sausalito	45	129	184	121	127	40	108	207	360%	60%	13%	71%	63%	418%	92%
5	San Anselmo Ave at Tunstead Ave., San Anselmo	34	41	40	69	62	100	58	46	35%	12%	15%	-33%	-26%	-54%	-21%
6	Broadway at Bolinas Rd., Fairfax	20	61	67	80	58	303	98	55	175%	-10%	-18%	-31%	-5%	-82%	-44%
7	Grant Ave. at Redwood Blvd., Novato	12	21	17	14	14	25	17	70	483%	233%	312%	400%	400%	180%	312%
8	Magnolia Ave. at Ward St., Larkspur	N/A	25	33	45	25	26	31	16	N/A	-36%	-52%	-64%	-36%	-38%	-48%
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	88	84	98	93	81	99	91	122	39%	45%	24%	31%	51%	23%	34%
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	42	101	156	116	166	114	116	153	264%	51%	-2%	32%	-8%	34%	32%
11	Tiburon Bike Path at Blackie's Pasture, Tiburon ¹	32	77	58	93	93	86	73	36	13%	-53%	-38%	-61%	-61%	-58%	-51%
12	Larkspur-Corte Madera Path at Baltimore Wye	42	28	44	41	36	68	43	31	-26%	11%	-30%	-24%	-14%	-54%	-28%
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	4	27	38	35	61	N/A	33	24	500%	-11%	-37%	-31%	-61%	N/A	-27%
14	Medway Rd. at Belvedere St., San Rafael	N/A	55	80	51	49	41	55	40	N/A	-27%	-50%	-22%	-18%	-2%	-27%
15	Camino Alto at E. Blithedale, Mill Valley	N/A	36	33	18	93	20	40	12	N/A	-67%	-64%	-33%	-87%	-40%	-70%
16	Alameda Del Prado at Nave Drive, Novato	N/A	6	11	4	28	27	15	3	N/A	-50%	-73%	-25%	-89%	-89%	-80%
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	16	22	11	15	65	101	38	29	81%	32%	164%	93%	-55%	-71%	-24%
18	Doherty Dr. at Hall Middle School, Larkspur ²	N/A	28	26	40	78	86	52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Sir Francis Drake at Wolfe Grade, Kentfield ¹	22	9	12	10	88	40	30	51	132%	467%	325%	410%	-42%	28%	70%
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	N/A	37	39	35	30	76	43	33	N/A	-11%	-15%	-6%	10%	-57%	-23%
21	South Novato Blvd. at Rowland, Novato	N/A	18	N/A	12	76	12	30	5	N/A	-72%	N/A	-58%	-93%	-58%	-83%
22	Bellam at Andersen, San Rafael	16	21	N/A	25	26	29	23	66	313%	214%	N/A	164%	154%	128%	187%
23	Nicasio Valley Road near Nicasio School, Nicasio ³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Average Count per Location	31	43	53	49	63	68	51	52	68%	21%	-2%	6%	-17%	-24%	2%

¹ PM Counts were collected from 2-6 PM and the highest consecutive 2 hours were reported

² No counts were collected on Doherty Drive due to a construction closure

³ No weekday counts were collected on Nicasio Valley Road

Table 21: Weekend Peak-Hour Bicycle Counts and Percent Change, 1999-2012

ID	Streets	Counts								Percent Change Between Count Year and 2012						
		1999	2007	2008	2009	2010	2011	1999-2011 Avg	2012	1999	2007	2008	2009	2010	2011	1999-2011 Avg
1	Tiburon Blvd at Main Street, Tiburon	43	154	147	64	213	185	134	127	195%	-18%	-14%	98%	-40%	-31%	-5%
2	Miller Ave. at Throckmorton, Mill Valley	36	56	58	36	235	89	85	60	67%	7%	3%	67%	-74%	-33%	-29%
3	4th and B St., San Rafael	32	27	46	23	20	41	32	40	25%	48%	-13%	74%	100%	-2%	25%
4	Bridgeway at Princess St., Sausalito	188	91	467	502	460	476	364	283	51%	211%	-39%	-44%	-38%	-41%	-22%
5	San Anselmo Ave at Tunstead Ave., San Anselmo	73	102	34	128	119	166	104	233	219%	128%	585%	82%	96%	40%	124%
6	Broadway at Bolinas Rd., Fairfax	42	167	82	239	128	238	149	302	619%	81%	268%	26%	136%	27%	103%
7	Grant Ave. at Redwood Blvd., Novato	10	9	24	19	135	0	33	15	50%	67%	-38%	-21%	-89%	100%	100%
8	Magnolia Ave. at Ward St., Larkspur	36	76	102	104	113	125	93	188	422%	147%	84%	81%	66%	50%	102%
9	Mill Valley-Sausalito Path at E. Blithedale, Mill Valley	144	111	302	300	243	279	230	355	147%	220%	18%	18%	46%	27%	54%
10	Mill Valley-Sausalito Path at Tennessee Valley Path Junction, Tam Junction	122	266	339	397	344	386	309	308	152%	16%	-9%	-22%	-10%	-20%	0%
11	Tiburon Bike Path at Blackie's Pasture, Tiburon ¹	106	80	139	153	251	255	164	114	8%	43%	-18%	-25%	-55%	-55%	-30%
12	Larkspur-Corte Madera Path at Baltimore Wye	62	57	57	69	66	77	65	47	-24%	-18%	-18%	-32%	-29%	-39%	-28%
13	Corte Madera Creek Path at Bon Air Rd., Greenbrae	30	35	26	49	66	N/A	41	40	33%	14%	54%	-18%	-39%	N/A	-2%
14	Medway Rd. at Belvedere St., San Rafael	N/A	32	57	92	87	82	70	7	N/A	-78%	-88%	-92%	-92%	-91%	-90%
15	Camino Alto at E. Blithedale, Mill Valley	N/A	38	131	42	20	21	50	82	N/A	116%	-37%	95%	310%	290%	64%
16	Alameda Del Prado at Nave Drive, Novato	N/A	5	13	30	22	32	20	32	N/A	540%	146%	7%	45%	0%	60%
17	Ranchitos Rd at Puerto Suello Summit, San Rafael	N/A	67	4	11	11	38	26	59	N/A	-12%	1375%	436%	436%	55%	127%
18	Doherty Dr. at Hall Middle School, Larkspur ²	N/A	19	31	12	9	37	22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Sir Francis Drake at Wolfe Grade, Kentfield ¹	N/A	15	7	7	12	38	16	36	N/A	140%	414%	414%	200%	-5%	125%
20	Andersen Drive at Cal Park Tunnel Path, San Rafael	N/A	23	23	14	95	77	46	47	N/A	104%	104%	236%	-51%	-39%	2%
21	South Novato Blvd. at Rowland, Novato	N/A	13	N/A	10	11	15	12	20	N/A	54%	N/A	100%	82%	33%	67%
22	Bellam at Andersen, San Rafael	N/A	8	N/A	16	22	49	24	30	N/A	275%	N/A	88%	36%	-39%	25%
23	Nicasio Valley Road near Nicasio School, Nicasio	N/A	N/A	N/A	83	77	62	74	32	N/A	N/A	N/A	-61%	-58%	-48%	-57%
	Average Count per Location	71	66	104	104	120	126	99	112	58%	70%	8%	8%	-7%	-11%	13%

¹ PM Counts were collected from 2-6 PM and the highest consecutive 2 hours were reported

² No counts were collected on Doherty Drive due to a construction closure



7.0 ADDITIONAL SYSTEM PERFORMANCE MEASURES

The Transit Authority of Marin has decided to monitor additional system performance measures that are not required as part of the CMP. Only roadway segment level of service is required, but TAM has additional measures that reflect the County's desire to improve the overall transportation network, which includes transit, bicyclist, and pedestrian activity.

The additional system performance measures to be monitored include:

1. Aggregate Peak Hour Travel Time
2. Person Throughput including Bicycle and Pedestrian Usage

These performance measures are presented for informational purposes only since it is not a CMP requirement.

7.1 Aggregate Peak Hour Travel Time

Aggregate peak hour travel times were measured for four integral commute corridors as identified by the Marin County CMP to determine the multi-modal travel times for the particular segments. These travel times account for three different types of travel modes: the auto single occupancy vehicle (SOV), the high occupancy vehicle (HOV), and the transit bus. The commute travel time will be reported on the following four corridors:

1. US-101 from the San Rafael Transit Center to the Sonoma County line
2. US-101 from the San Rafael Transit Center to the Golden Gate Bridge
3. Sir Francis Drake Boulevard from Butterfield to US-101
4. Red Hill Avenue from Sir Francis Drake Boulevard to the San Rafael Transit Center

The SOV and HOV travel times were recorded using GPS data along each corridor to determine the travel time. Each corridor was driven at least six (6) times during each peak hour. The bus travel times were estimated based off bus schedules off the Marin Transit and Golden Gate Transit websites. This methodology was similar to how bus travel times were estimated in 2010 and previous CMPs.

Table 22 summarizes the commute peak hour corridor travel times for the four segments above and is compared to the 2010 results.

The auto or SOV travel times compare similarly between 2010 and 2012. The only locations that differ significantly are the segments of Sir Francis Drake Boulevard between Butterfield and US-101 in the southeast-bound direction in the AM peak and US-101 between the Golden Gate Bridge and the San Rafael Transit Center in the southbound direction in the PM peak. The location along Sir Francis Drake Boulevard experiences an increase in travel time from nine minutes in 2010 to 18 minutes in 2012. This can be attributed to the congestion primarily between Butterfield and College Avenue that causes the speeds to decrease to roughly 10-15 mph. The location along US-101 from the Golden Gate Bridge to the San Rafael Transit Center experiences an increase in travel time from 11 minutes in 2010 to 16 minutes in 2012. This can



be attributed to the slower speeds along the segment of 35-55 mph in 2012 as compared to speeds of 55-70 mph in 2010.

The HOV travel times compare similarly between 2010 and 2012. The only location that differs somewhat significantly is the segment of US-101 between the Golden Gate Bridge and the San Rafael Transit Center in the northbound direction in the PM peak. At this location, the travel time increase from 14 minutes in 2010 to 18 minutes in 2012. This can be attributed to the slower speeds in the HOV lane just south of Sir Francis Drake Boulevard in 2012. In 2010, the speeds in the HOV lane ranged from 50-70 mph. In 2012, the speeds in the HOV lane ranged from 20-60 mph.

The bus travel times along US-101 between the San Rafael Transit Center and the Sonoma County line were lower in 2012 than in 2010 because the 2012 bus times were measured to Novato, as compared to Petaluma in 2010. This difference in distance of approximately 12 miles accounts for the discrepancy in bus travel times.

The bus travel times along US-101 between the San Rafael Transit Center and the Golden Gate Bridge were similar between 2010 and 2012, except in the northbound direction in the PM peak. The travel time went down from 88 minutes to 53 minutes, with both travel times measured from the Golden Gate Bridge toll plaza to the San Rafael Transit Center.

The bus travel times along Sir Francis Drake Boulevard between the Butterfield and US-101 increased slightly from 2010 to 2012. In 2012, an additional bus route served the corridor that was unavailable in 2010. Route 29 provided service along Sir Francis Drake Boulevard in the northwest-bound direction in the AM peak.

The bus travel times along Red Hill Avenue between the Sir Francis Drake Boulevard and the San Rafael Transit Center remained the same from 2010 to 2012.



Table 22: Peak Hour Travel Times by Mode

Corridor	From	To	Direction	2010 (minutes)						2012 (minutes)					
				AM Peak			PM Peak			AM Peak			PM Peak		
				Auto	HOV	Bus	Auto	HOV	Bus	Auto	HOV	Bus	Auto	HOV	Bus
US-101	San Rafael Transit Center	Sonoma County line	NB	15	N/A	44 ^A	23	23	43 ^A	16	N/A	25 ^{AA}	23	22	32 ^{AA}
			SB	21	18	66 ^A	15	N/A	61 ^A	20	19	32 ^{AA}	17	N/A	29 ^{AA}
US-101	Golden Gate Bridge	San Rafael Transit Center	NB	11	N/A	45 ^B	20	14	88 ^B	14	N/A	39 ^B	18	18	52 ^B
			SB	12	11	45 ^C	11	N/A	50 ^C	13	12	49 ^C	16	N/A	53 ^C
Sir Francis Drake Blvd	Butterfield	US-101	NWB	11	N/A	N/A	16	N/A	18 ^E	13	N/A	36 ^{DD}	14	N/A	23 ^E
			SEB	9	N/A	24 ^D	18	N/A	N/A	18	N/A	29 ^E	16	N/A	N/A
Red Hill Avenue	Sir Francis Drake Blvd	San Rafael Transit Center	NWB	5	N/A	13 ^F	9	N/A	13 ^F	7	N/A	13 ^F	9	N/A	13 ^F
			SEB	5	N/A	13 ^F	6	N/A	13 ^F	8	N/A	13 ^F	6	N/A	13 ^F

^A Estimated based on commute bus Route 70 & 80 between San Rafael Transit Center and 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 70 & 80 from San Rafael Transit Center and SF Civic Center (GG time is not published)

^D Estimated based on commute bus Route 24 between Bank and US 101/Lucky Drive Bus Pad

^E Estimated based on commute bus Route 24 between Center and US 101/Lucky Drive Bus Pad (Bank not a stop in NB PM)

^F Estimated based on commute bus Route 23 between San Rafael Transit Center and SFD/Center Street Hub instead of the Butterfield

^{AA} Estimated based on commute bus Route 70 & 80 between San Rafael Transit Center and Novato-Redwood/Olive (Petaluma Depot time is not published)

^{DD} Estimated based on commute bus Route 29 between Eliseo Drive and Fairfax-Broadway/Bolinas



7.2 Person Throughput

One of the major goals of the *Moving Forward: A 25-Year Transportation Vision for Marin County*⁵ is to transition towards a multi-modal future. To accommodate the increasing congestion in the County, Marin would like to decrease the automobile demand as opposed to building new roads and widening highways to increase capacity. This solution would encourage alternative modes of travel to the automobile, such as carpooling, transit, bicycling, and walking to decrease vehicular demand on the roadways.

To measure the effectiveness of this goal, vehicular volume counts were surveyed. In addition, the number of persons was also surveyed to determine if there was an increase in persons using alternative modes of transportation. Measuring the number of persons in the transportation system would more accurately assess the number of people, not vehicles getting through the system. By measuring the person throughput, as compared to the vehicle throughput, the benefits of HOV lanes and transit can be identified.

Vehicular volumes were measured at select locations along essential corridors in Marin County, in addition to the number of riders in each vehicle. The number of riders in a vehicle is also known as the vehicle occupancy. Vehicle occupancy counts were collected at the following locations:

1. US-101 at the Golden Gate Bridge
2. US-101 north of SR-131 (Tiburon Boulevard)
3. US-101 from Manual T. Freitas Parkway to Lucas Valley Road
4. US-101 from north of Atherton Ave to the Sonoma County line
5. I-580 from Sir Francis Drake Boulevard to the Marin County line
6. SR-1 from Northern Avenue to Almonte Boulevard
7. SR-1 from US-101 to Tennessee Valley Road

Table 23 displays the number of transit persons, auto persons, and carpool persons for each essential corridor to determine the overall number of persons getting through the system.

The maximum number hourly of total person throughput is on US-101 from SR-131 to Paradise Drive in the AM peak hour and in the southbound direction with 9,702 persons. The majority of the persons are from the auto persons in the general category or otherwise known as the single-occupancy vehicle lanes. However, there are a significant number of HOV lane users and transit persons. Of the 9,702 total persons at this location, 1,412 persons use transit, which is approximately 15% of the total person throughput. In addition, 1,797 persons use the HOV lane, which is approximately 19% of the total person throughput.

⁵ *Moving Forward: A 25-Year Transportation Vision For Marin County*, Nelson/Nygaard Consulting Associates, February 2003.



Table 23: Person Throughput

Corridor	From	To	Direction	2012									
				AM Peak Hour					PM Peak Hour				
				Transit Person	Auto Person: Mixed Flow	Auto Person: HOV	Van Pool Person	Total Person	Transit Person	Auto Person: General	Auto Person: HOV Lane	Van Pool Person	Total Person
US-101	Golden Gate Bridge	-	NB	139	3,139	-	0	3,278	1,277	4,458	-	32	5,767
			SB	1,299	5,568	-	32	6,899	125	5,174	-	0	5,299
US-101	SR-131	Paradise Drive	NB	447	7,717	-	12	8,176	1,402	4,055	2,076	39	7,572
			SB	1,412	6,454	1,797	39	9,702	408	7,092	-	12	7,512
US-101	Manual T Freitas Parkway	Lucas Valley Road	NB	281	6,572	-	0	6,853	808	3,702	2,313	84	6,907
			SB	551	6,608	1,858	84	9,101	276	6,393	-	0	6,669
US-101	Atherton Ave	Sonoma County line	NB	18	2,548	-	0	2,566	256	5,182	-	19	5,457
			SB	89	4,173	-	19	4,281	49	3,020	-	0	3,069
I-580	Sir Francis Drake Blvd	Marin County line	WB	50	4,437	-	78	4,565	23	2,785	-	195	3,003
			EB	29	2,314	-	195	2,538	47	3,798	-	78	3,923
SR-1	Northern Avenue	Almonte Boulevard	WB	26	515	-	0	541	0	734	-	0	734
			EB	0	1,154	-	0	1,154	31	613	-	0	644
SR-1	US-101	Tennessee Valley Road	WB	84	1,177	-	0	1,261	338	1,798	-	0	2,136
			EB	510	1,911	-	0	2,421	52	1,470	-	0	1,522



The only corridors that were collected in both 2010 and 2012 were on US-101 from SR-131 to Paradise Drive and on US-101 from Atherton Avenue to the Sonoma County line. In the previous CMP in 2010, only the PM peak direction was reported and only in the northbound direction.

The total throughput on US-101 from SR-131 to Paradise Drive in the PM peak and in the northbound direction is 7,572 persons. This is much lower than the 10,070 person throughput in 2010 at the same location in the PM peak in the northbound direction. This drop could be attributed to the slower speeds in this section of US-101, thereby lowering the total number of persons through in the peak hour. Although the total number of persons through this point has decreased, the number of transit persons has stayed essentially the same. In 2010, there were 1,400 persons using transit on an average weekday in the PM peak at this location, compared to 1,402 persons in 2012. However this accounts for 19% of the total persons in 2012, compared to just 14% in 2010. The number of HOV lane users was 2,226 persons in 2010 and 2,076 persons in 2012, which is an increase in percentage of total users using HOV of 27% in 2012 versus 22% in 2010.

The total throughput on US-101 from Atherton Avenue to the Sonoma County line in the PM peak and in the northbound direction is 5,457 persons. This is much higher than the 3,703 person throughput in 2010 at the same location in the PM peak in the northbound direction. Although the total number of persons through this point has increased, the number of transit persons has slightly decreased. In 2010, there were 320 persons using transit on an average weekday in the PM peak at this location, compared to 256 persons in 2012. Additionally, the percentage of transit users as compared to total number of persons has decreased from 5% of the total persons in 2012, compared to 9% in 2010. There is no HOV lane through this section of US-101.