

District 04 Mobility Performance Report

2023 1st Quarter

DEPARTMENT OF TRANSPORTATION

April 28, 2023

District 4-Office of Asset Management and Performance

ABBREVIATIONS

Abs	Absolute
Avg	Average
CA	California
CO	County
MPR	Mobility Performance Report
PeMS	Performance Measurement System
PM	Postmile
Q	Quarter

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2023 1st Quarter

EXECUTIVE SUMMARY

Overview

Caltrans District 4 is comprised of nine counties that border the San Francisco Bay: Alameda (ALA), Contra Costa (CC), Marin (MRN), Napa (NAP), San Francisco (SF), San Mateo (SM), Santa Clara (SCL), Solano (SOL), and Sonoma (SON) Counties. Although these are urban counties, they do contain a large amount of sparsely populated land.

The Mobility Performance quarterly analysis compares information from over a year ago and over last quarter in the following performance measures:

- Vehicle Miles of Travel (VMT)
- Vehicle Hours of Delay (VHD)
- Lost Lane Miles (equivalent lost productivity)
- Detector Health

This information is based on data collected every day of the quarter, twenty-four hours a day, by automated vehicle detector stations deployed on urban-area freeways where congestion is regularly experienced. The MPR presents congestion information at two-speed thresholds: delay from vehicles traveling below 35 miles per hour (mph), and delay from vehicles traveling below 60 mph. The delay at the 35 mph threshold represents severe congestion while delay at 60 mph represents all congestion, both light and heavy. These thresholds are set by Caltrans and are based upon engineering experience and District input.

FINDINGS

Over three years have passed since the Statewide Shelter-In-Place (SIP) took effect on March 19, 2020. To combat the pandemic, vaccinations and boosters were being administered to all eligible individuals based on state guidelines. On June 15th, 2021, California State Governor Gavin Newsom announced the reopening of California. During Q1 2023, there was a 5.3% increase in VMT compared to the same quarter a year ago, with VMT increasing from 6.7 billion in Q1 2022 to 7.1 billion in Q1 2023. In the first quarter, we see a decrease of 4.7% (345 million) in VMT from the previous quarter's VMT of 7.4 billion.

Annual increases are not only seen in VMT, but also in VHD. Compared to the same quarter the year before, there was a 57.4% increase from 3.5 million to 5.5 million VHD in the 35 mph total quarterly delay, and a 38.8% increase from 9.1 million to 12.7 million VHD in the 60 mph total quarterly delay. A quarterly increase was seen in VHD unlike the decrease seen in quarterly VMT. Compared to the previous quarter, Q1 saw a 6.9% increase in VHD at 35 mph and 0.9% increase in VHD at 60 mph.

The average weekday delay in this quarter has increased compared to the year before. Last year, during the same quarter, there was a delay of 49 thousand VHD at 35 mph, and 128 thousand VHD at 60 mph. Whereas this quarter, there was a delay of 81 thousand VHD at 35 mph which is a 65.2% increase, and 183 thousand VHD at 60 mph which is a 43.0% increase. Thursday with 211 thousand VHD was the most congested day of the week in Q1. Thursday has also been the most congested day of the week in same quarter a year ago and last quarter. Tuesday had the largest magnitude increase of 66 thousand VHD at 60 mph which was a 53.9% increase from the same quarter last year. Each day of the week observed magnitude increases in average VHD from the same quarter last year. Monday had the largest magnitude increase of 21 thousand (18.2%) VHD at 60 mph compared to last quarter. Sundays and Holidays had the largest magnitude decrease of 23 thousand (36%) VHD at 60 mph compared to last quarter.

Looking at the Average VHD at 35 mph by hour of the day for weekdays, there was an increase in the AM commute period congestion compared to last year. The largest magnitude hourly change for AM hours compared to the same quarter a year ago occurred at 8 AM with an increase of 60.1%. The largest magnitude hourly weekday increase over last quarter occurred at

8 AM with an increase of 24.2%. For the PM hours, the largest magnitude hourly increase of 60%, occurred at 5 PM when comparing with the same quarter last year, and the largest magnitude increase of 9.3% occurred at 4 PM when comparing with last quarter. The weekday peak hour average delay of 14,325 VHD for this quarter occurs at 5pm which is the same as last quarter and a year ago. Compared to last quarter's peak hour VHD of 13,882 VHD, there was a 3.19% increase. Compared to a year ago, there was a 60% increase from a VHD of 8,955. The largest single hour decrease compared to a year ago on Saturday occurred at 12 PM with a -10.8% change, and the largest decrease on Saturday over last quarter occurred at 5 PM with a change of -16.4%. The largest single hour increase on Saturday compared to a year ago occurred at 7 PM with a change of 67.2%, and when compared with last quarter it occurred at 8PM with an increase of 47%. As for the Sunday/Holidays, the largest magnitude decrease over a year ago is -4.2% at 4 PM, and over last quarter -53.8% at 5 PM. The largest magnitude increase over a year ago is 334.5% at 8 AM. The largest magnitude increase over last quarter occurred at 9 PM with a change of 73.6%.

Similarly to the same quarter last year and the previous quarter, Alameda County was the most congested county in the District with 2,563,000 vehicle hours of total delay at 35 mph during the first quarter. Santa Clara County was the second most congested county in the District with 1,232,000 vehicle hours of total delay at 35 mph. Contra Costa County was the third most congested county in the District with 765,000 vehicle hours of total delay at 35 mph. Alameda County experienced the largest magnitude increase of 82.1% compared to the same quarter last year, while San Francisco County experienced the largest magnitude decrease of -18.5% compared to last quarter.

From the Top 10 Bottlenecks for the 1st Quarter, seven bottleneck locations occurred during the PM, and three bottleneck locations occurred in the AM period. The top three locations are as follows:

- ALA I880 Northbound, North of Eldridge POC during PM period (Rank 1, previously ranked 2 in Q4 2022): 130,729 vehicle hours of delay

- CC I80 Eastbound, 1200' East of Pinole Valley Road during PM period (Rank 2, previously ranked 1 in Q4 2022 as Pinole Valley Road): 115,258 vehicle hours of delay
- CC SR4 Westbound 5400' East of Willow Pass Road during AM period (Rank 3, previously ranked 5 in Q4 2022): 97,097 vehicle hours of delay

This quarter, seven of the ten locations have resurfaced from last quarter's top 10 bottleneck list (bottlenecks in ranks 5, 7, and 9 are new). Rank 1 (previously Rank 2 in Q4 2022), ALA I880 Northbound PM, North of Eldridge POC increased 7.8% from 121,298 to 130,729 VHD. Rank 2 (previously Rank 1 in Q4 2022), CC I80 Eastbound PM, 1200' East of Pinole Valley Road decreased 9.9% from 127,938 to 115,258 VHD. Rank 3 (previously Rank 5 in Q4 2022), CC SR-4 Westbound AM, 5400' E of Willow Pass Rd increased 33.0% from 73,024 to 97,097 VHD. Rank 4 (previously Rank 4 in Q4 2022), ALA I80 Eastbound PM at University Ave increased 4.2% from 82,923 to 86,404 VHD. Rank 5 (previously unranked in Q4 2022), ALA I680 Southbound PM, 1.0 mi. South of Sunol Blvd is new on the list this quarter at 67,446 VHD. Rank 6 (previously Rank 6 in Q4 2022), SCL US101 Southbound PM, North 13th St-Oakland Rd decreased 6.4% from 67,312 to 63,030 VHD. Rank 7 (previously Rank 14 in Q4 2022), SCL SR85 Southbound PM at Union Ave increased 27.0% from 46,893 to 59,565 VHD. Rank 8 (previously Rank 8 in Q4 2022), ALA I80 Westbound AM at Gilman St increased 2.4% from 57,295 to 58,686. Rank 9 (previously Rank 11 in Q4 2022), CC I680 Northbound PM, 100' North of Oak Park Blvd increased 3.9% from 53,326 to 55,390 VHD. Rank 10 (previously Rank 9 in Q4 2022), ALA I80 Westbound PM at Powel St. stayed about the same from 54,651 to 54,624 VHD.

A plurality of locations across District 4 had an increase in activity compared to a year ago. On the Congestion by Route table, 34 out of the 49 Route Counties listed have increases in congestion compared to a year ago, 4 remained unchanged, and 11 show a decrease. Compared to last quarter, most locations have increased. On the Congestion by Route table, 26 out of the 49 Route Counties listed have increased when comparing to last quarter. Several routes experienced large swings in congestion due to this quarter last year. This is generally due to detectors being

fixed, no longer being deactivated due to a construction project, or added in places where they did not previously exist.

Regarding vehicle detector health, there was a 1% increase in the number of good detectors, which are functional, and 1% decrease in the number of bad detectors, which are no longer able to measure congestion, compared to last quarter.

Top Ten Bottlenecks for the 2023 1st Quarter:

Rank	County	Fwy	Approximate Location	Shift	Absolute Postmile	Begin CA PM	Avg Extent (miles)	Total Delay (veh-hrs)	Total Duration (minutes)	# of active days	Latitude	Longitude
1	Alameda	I880-N	N of Eldridge POC	PM	26.3	16.09	5.0	130,729	10,970	58	37.63718	-122.08826
2	Contra Costa	I80-E	1200' E of Pinole Valley Rd	PM	22.4	9.08	5.5	115,258	5,095	55	38.00372	-122.27979
3	Contra Costa	SR4-W	5400' E of Willow Pass Rd	AM	17.5	17.85	4.9	97,097	8,030	58	38.02145	-121.98179
4	Alameda	I80-E	University Ave	PM	7.9	6.64	4.5	86,404	8,160	59	37.86489	-122.30302
5	Alameda	I680-S	1.0 mi S of Sunol Blvd	AM	24.3	14.24	5.5	67,446	6,990	44	37.63268	-121.88331
6	Santa Clara	US101-S	N 13th St-Oakland Rd	PM	387.3	37.61	2.1	63,030	13,135	63	37.36271	-121.88943
7	Santa Clara	SR85-S	Union Ave	PM	9.1	9.1	2.3	59,565	11,320	60	37.25045	-121.92823
8	Alameda	I80-W	Gilman St	AM	11.9	6.6	3.2	58,686	7,315	60	37.87741	-122.30724
9	Contra Costa	I680-N	100' N of Oak Park Blvd	PM	46.4	16	2.1	55,390	5,280	60	37.93565	-122.06010
10	Alameda	I80-W	Powell St	PM	9.2	3.9	1.7	54,624	11,410	61	37.83967	-122.29700

Measure	Graph	Percentage Change									
		Over one year ago	Over last quarter								
Vehicle Miles of Travel (VMT)	<p>Miles (Billions)</p> <table border="1"> <tr><th>Period</th><th>Value</th></tr> <tr><td>2022 Q1</td><td>6.71</td></tr> <tr><td>2022 Q4</td><td>7.4</td></tr> <tr><td>2023 Q1</td><td>7.06</td></tr> </table>	Period	Value	2022 Q1	6.71	2022 Q4	7.4	2023 Q1	7.06	5.3%	-4.7%
		Period	Value								
		2022 Q1	6.71								
2022 Q4	7.4										
2023 Q1	7.06										
↑	↓										
Total Vehicle Hours of Delay (VHD) at 35 mph	<p>Hours (Millions)</p> <table border="1"> <tr><th>Period</th><th>Value</th></tr> <tr><td>2022 Q1</td><td>3.5</td></tr> <tr><td>2022 Q4</td><td>5.2</td></tr> <tr><td>2023 Q1</td><td>5.5</td></tr> </table>	Period	Value	2022 Q1	3.5	2022 Q4	5.2	2023 Q1	5.5	57.4%	6.9%
		Period	Value								
		2022 Q1	3.5								
2022 Q4	5.2										
2023 Q1	5.5										
↑	↑										
Average Non-Holiday Weekday Vehicle Hours of Delay (VHD) at 35 mph	<p>Hours (Thousands)</p> <table border="1"> <tr><th>Period</th><th>Value</th></tr> <tr><td>2022 Q1</td><td>49</td></tr> <tr><td>2022 Q4</td><td>72</td></tr> <tr><td>2023 Q1</td><td>81</td></tr> </table>	Period	Value	2022 Q1	49	2022 Q4	72	2023 Q1	81	65.2%	13.6%
		Period	Value								
		2022 Q1	49								
2022 Q4	72										
2023 Q1	81										
↑	↑										
Total Vehicle Hours of Delay (VHD) at 60 mph	<p>Hours (Millions)</p> <table border="1"> <tr><th>Period</th><th>Value</th></tr> <tr><td>2022 Q1</td><td>9.1</td></tr> <tr><td>2022 Q4</td><td>12.6</td></tr> <tr><td>2023 Q1</td><td>12.7</td></tr> </table>	Period	Value	2022 Q1	9.1	2022 Q4	12.6	2023 Q1	12.7	38.8%	0.9%
		Period	Value								
		2022 Q1	9.1								
2022 Q4	12.6										
2023 Q1	12.7										
↑	↑										
Average Non-Holiday Weekday Vehicle Hours of Delay (VHD) at 60 mph	<p>Hours (Thousands)</p> <table border="1"> <tr><th>Period</th><th>Value</th></tr> <tr><td>2022 Q1</td><td>128</td></tr> <tr><td>2022 Q4</td><td>171</td></tr> <tr><td>2023 Q1</td><td>183</td></tr> </table>	Period	Value	2022 Q1	128	2022 Q4	171	2023 Q1	183	43%	6.8%
		Period	Value								
		2022 Q1	128								
2022 Q4	171										
2023 Q1	183										
↑	↑										

Measure	Graph	Percentage Change	
Average Vehicle Hours of Delay by Day of Week at 60 mph		Largest Magnitude Decrease over one year ago	Largest Magnitude Decrease over last quarter
		-	Sun/Ho -36% ↓
Average Vehicle Hours of Delay by Hour of Day at 35 mph, Weekdays		Largest Magnitude Weekday Decrease over one year ago	Largest Magnitude Weekday Decrease over last quarter
		-	12 PM -4.1% ↓
Average Vehicle Hours of Delay by Hour of Day at 35 mph, Saturdays		Largest Magnitude Saturday Decrease over one year ago	Largest Magnitude Saturday Decrease over last quarter
		12 PM -10.8% ↓	5 PM -16.4% ↓
Average Vehicle Hours of Delay by Hour of Day at 35 mph, Sundays/Holidays		Largest Magnitude Sun./Holiday Decrease over one year ago	Largest Magnitude Sun./Holiday Decrease over last quarter
		4 PM -4.2% ↓	5 PM -53.8% ↓
		Largest Magnitude Increase over one year ago	Largest Magnitude Increase over last quarter
		Tuesday 53.9% ↑	Monday 18.2% ↑
		5 PM 60% ↑	8 AM 24.2% ↑
		7 PM 67.2% ↑	8 PM 47% ↑
		8 AM 334.5% ↑	9 PM 73.6% ↑

Measure	Graph	Percentage Change	
Total Vehicle Hours of Delay (VHD) by County at 35 mph		Largest Magnitude Decrease over one year ago	Largest Magnitude Decrease over last quarter
		San Francisco -17.8% ↓	San Francisco -18.5% ↓
		Largest Magnitude Increase over one year ago	Largest Magnitude Increase over last quarter
Alameda 82.1% ↑	Alameda 17.6% ↑		
Average Non-Holiday Weekday Equivalent Lost Lane Mile Hours at 35 mph		Largest Magnitude Decrease over one year ago	Largest Magnitude Decrease over last quarter
		-	-
		Largest Magnitude Increase over one year ago	Largest Magnitude Increase over last quarter
PM Peak 40% ↑	AM Peak 18.5% ↑		
Average Number of Good and Bad Detectors		Change in Good over one year ago	Change in Good over last quarter
		13% ↑	1% ↑
		Change in Bad over one year ago	Change in Bad over last quarter
-13% ↓	-1% ↓		

Congestion by Route

Route	County	Vehicle Hours of Delay at 35 mph			Difference 2023 Q1-2022 Q1		Difference 2023 Q1-2022 Q4		Rank		
		2022 Q1	2022 Q4	2023 Q1	Absolute	Percentage	Absolute	Percentage	2022 Q1	2022 Q4	2023 Q1
I580	Alameda	337,456	513,778	996,947	659,492	195.4%	483,169	94.0%	3	2	1
I880	Alameda	447,646	555,432	672,788	225,142	50.3%	117,356	21.1%	1	1	2
US101	Santa Clara	269,162	511,785	534,459	265,298	98.6%	22,674	4.4%	4	3	3
I80	Alameda	340,048	432,454	348,733	8,685	2.6%	-83,721	-19.4%	2	4	4
SR85	Santa Clara	92,892	171,270	206,625	113,733	122.4%	35,355	20.6%	11	8	5
I80	Contra Costa	184,101	188,372	195,704	11,603	6.3%	7,332	3.9%	6	7	6
US101	San Francisco	203,930	211,939	193,898	-10,032	-4.9%	-18,041	-8.5%	5	5	7
I680	Alameda	49,717	51,711	184,289	134,572	270.7%	132,578	256.4%	22	28	8
I280	Santa Clara	82,637	137,625	156,023	73,387	88.8%	18,398	13.4%	14	11	9
I680	Contra Costa	100,213	120,982	151,619	51,407	51.3%	30,637	25.3%	9	13	10
SR4	Contra Costa	151,599	157,987	150,496	-1,104	-0.7%	-7,491	-4.7%	7	9	11
I80	Solano	87,060	206,748	148,672	61,613	70.8%	-58,076	-28.1%	13	6	12
SR92	Alameda	94,461	102,915	138,895	44,434	47.0%	35,981	35.0%	10	14	13
US101	San Mateo	92,339	148,100	128,511	36,172	39.2%	-19,589	-13.2%	12	10	14
SR24	Alameda	28,337	34,755	115,220	86,883	306.6%	80,465	231.5%	31	29	15
US101	Marin	52,522	73,278	106,286	53,763	102.4%	33,008	45.0%	21	22	16
I880	Santa Clara	39,251	123,474	102,277	63,026	160.6%	-21,197	-17.2%	26	12	17
SR37	Solano	115,840	99,105	101,523	-14,318	-12.4%	2,417	2.4%	8	15	18
SR24	Contra Costa	65,425	78,970	96,728	31,303	47.8%	17,758	22.5%	18	19	19
SR237	Santa Clara	32,023	84,099	87,540	55,517	173.4%	3,441	4.1%	27	16	20
SR242	Contra Costa	67,422	66,457	85,513	18,091	26.8%	19,056	28.7%	17	25	21
I580	Contra Costa	54,350	82,685	84,928	30,577	56.3%	2,242	2.7%	20	17	22
I280	San Mateo	30,798	74,558	81,133	50,336	163.4%	6,575	8.8%	28	21	23
US101	Sonoma	41,174	79,330	74,580	33,406	81.1%	-4,749	-6.0%	25	18	24
SR84	Alameda	58,798	68,793	68,915	10,116	17.2%	122	0.2%	19	23	25
SR87	Santa Clara	28,845	65,724	63,384	34,539	119.7%	-2,340	-3.6%	30	26	26
I680	Santa Clara	44,221	57,478	62,297	18,076	40.9%	4,819	8.4%	24	27	27
SR238	Alameda	47,690	75,131	50,560	2,870	6.0%	-24,571	-32.7%	23	20	28
I80	San Francisco	67,855	68,325	36,841	-31,014	-45.7%	-31,484	-46.1%	16	24	29
SR92	San Mateo	15,221	33,462	36,636	21,415	140.7%	3,175	9.5%	35	30	30
I280	San Francisco	12,202	31,080	26,488	14,286	117.1%	-4,592	-14.8%	36	31	31
I680	Solano	3,957	2,697	15,982	12,025	303.9%	13,285	492.7%	39	40	32
SR12	Napa	18,633	12,752	12,790	-5,842	-31.4%	39	0.3%	34	35	33
SR17	Santa Clara	21,624	9,993	8,999	-12,625	-58.4%	-994	-9.9%	32	36	34
I580	Marin	20,401	22,444	8,294	-12,107	-59.3%	-14,150	-63.0%	33	32	35
SR37	Sonoma	5,711	4,569	8,169	2,458	43.0%	3,599	78.8%	38	38	36
SR152	Santa Clara	6,976	16,395	6,031	-945	-13.5%	-10,364	-63.2%	37	33	37
SR25	Santa Clara	3,839	4,726	3,942	103	2.7%	-784	-16.6%	40	37	38
SR12	Solano	73,764	13,020	3,131	-70,633	-95.8%	-9,889	-75.9%	15	34	39
SR37	Marin	116	236	853	737	635.6%	617	261.6%	43	42	41
SR29	Napa	0	188	792	792		604	321.4%		43	42
I80	Napa	124	126	467	343	276.0%	342	271.5%	42	44	43
I780	Solano	4	22	69	65	1612.5%	47	218.6%	47	45	44
SR156	Santa Clara	5	10	22	16	315.4%	12	127.4%	46	48	45
SR13	Alameda	18	18	18	0	0.0%	0	0.0%	44	46	46
I880S	Alameda	12	12	12	0	0.0%	0	0.0%	45	47	47
SR1	San Francisco	29,030	4,176	9	-29,021	-100.0%	-4,167	-99.8%	29	39	48
SR160	Contra Costa	0	0	0	0		0				
TOTALS		3,522,478	4,801,370	5,559,872	2,037,394	57.8%	758,503	15.8%			