

District 04 Mobility Performance Report

2021 1st Quarter

DEPARTMENT OF TRANSPORTATION

June 11, 2021

District 4-Office of Highway Operations

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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2021 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

Statewide Shelter-In-Place (SIP) took effect on March 19, 2020, the last few weeks of Q1 2020. The full effect of the COVID-19 Pandemic on traffic wasn't seen until Q2 2020. A full year has passed since SIP took effect. To combat the pandemic, vaccinations are being administered to all eligible individuals based on state guidelines. According to Our World in Data, on March 31st, 2021, there are 6.3 million (25% of Californians) fully vaccinated individuals. The Centers of Disease Control and Prevention (CDC) urges individuals to social distance, and not travel if unnecessary. There was a -9.5% decrease in VMT compared to the same quarter a year ago, with VMT dropping from 6.9 billion in Q1 2020 to 6.2 billion in Q1 2021. In the first quarter, we see a decrease of -4.8% (approximately 317 million) in VMT from the previous quarter's VMT of 6.5 billion.

The decrease in VMT caused by the Covid-19 pandemic had a greater effect on VHD. Compared to the same quarter the year before, there was a -65.3% decrease from 6.8 million to 2.4 million in the 35 mph total quarterly delay, and a -49.3% decrease from 14.2 million to 7.2 million VHD in the 60 mph total quarterly delay.

The average weekday delay in this quarter has decreased compared to the year before. Last year, during the same quarter, there was a delay of 96 thousand VHD at 35 mph, and 205 thousand VHD at 60 mph. Whereas this quarter, there was a delay of 35 thousand VHD at 35 mph, and 105 thousand VHD at 60 mph. Friday was the most congested day of the week in Q1 similar to the quarter before versus Wednesday for the same quarter the year before. Wednesday had the largest magnitude decrease of 125 thousand which is -55% since a year ago. Monday had the largest magnitude decrease of -11.9% from last quarter. Saturday was the only day of the week that showed an increase, so it had the largest magnitude increase of 6.5% from last quarter.

Looking at the Average VHD at 35 mph by hour of the day for weekdays, there was a significant decrease in the AM commute period congestion compared to last year. The largest magnitude change compared to the same quarter a year ago occurred at 8 AM with a decrease of -87.9%. There were no hours in the day that showed increases from a year ago. Compared to last quarter, the largest magnitude decrease of -17.2% occurred at 6 PM, and the largest magnitude increase of 20.6% occurred at 7 AM. The PM commute period had decreased compared to the

previous quarter where the average VHD during the PM peak hour of 5 PM decreased to 7,200 thousand VHD from 7,700 thousand VHD the quarter before. The largest single hour decrease on Saturday compared to a year ago occurred at 5 pm of -68.5%, over last quarter occurred at 8 PM of -50.9%. The largest single hour increase on Saturday compared to a year ago occurred at 2 AM of 17.2%, over last quarter of 28.8% occurred at 12 PM. As for the Sunday/Holidays, the largest magnitude decrease over a year ago is -70% at 2 PM, over last quarter -43.2% at 5 PM. The largest magnitude increase over last quarter occurred at 1 PM of 36.7%.

While Shelter-in-place is still widely recommended due to COVID-19 and have gone into less restrictive tiers during the first quarter, San Francisco County had a total increase in vehicle hours of delay and vehicle miles of travel compared to last quarter. ALA, CC, SM, SCL, SOL and SON counties had a total decrease in vehicle hours of delay and vehicle miles of travel compared to last quarter. The remaining counties, NAP, and MRN had no significant change in vehicle hours of delay and vehicle miles of travel compared to last quarter.

Alameda County with 989,000 vehicle hours of total delay at 35 mph during the first quarter was the most congested county in the District. Contra Costa County with 395,000 vehicle hours of total delay at 35 mph was the second most congested county in the District. Santa Clara County experienced the largest magnitude decrease of -83.9% over one year ago. Alameda County experienced the largest magnitude decrease of -12.2% over last quarter. San Francisco County experienced the largest magnitude increase of 9.6% over the last quarter.

From the Top 10 Bottlenecks for the 1st Quarter, all top ten locations were from the PM period. The top three locations are as follows:

- ALA I80 Eastbound at Gilman Street during PM period (Rank 1, previously ranked 1 in Q4 2020): 88,700 vehicle hours of delay
- Ala I580 Eastbound at 4000' East of Greenville Rd during PM period (Rank 2, previously Rank 4 in Q4 2020): 62,960 vehicle hours of delay
- SCL US101 Southbound at Burnett Ave during PM period (Rank 3, previously ranked 5 in Q4 2020): 55,600 vehicle hours of delay

This quarter, there are seven locations that have resurfaced from last quarter's top 10 bottleneck list. Rank 1 (previously Rank 1 in Q4 2020), ALA I80 Eastbound at Gilman St. saw a 7% decrease in delay. Rank 2 (previously Rank 4 in Q4 2020), ALA I580 Eastbound at 4000' East of Greenville Rd increased 15% from 54,900 to 63,000 vehicle hours of delay. Rank 3 (previously Rank 5 in Q4 2020), US101 Southbound at Burnett Ave. bottleneck, saw a 9% increase in total delay, increasing from 51,200 to 55,600 vehicle hours of delay. Rank 4 (previously Rank 7 in Q4 2020) SON US101 Northbound at E. Washington St. bottleneck saw a 15% increase, with delays increasing from 46,500 to 53,300 vehicle hours of delay. Rank 5 (previously Rank 3 in Q4 2020), SOL SR12 Eastbound at Red Top Rd.-Rte 4 bottleneck, saw a 18% decrease in total delay, dropping from 58,600 to 48,200 vehicle hours of delay. Rank 7 (previously Rank 8 in Q4 2020), CC I80 Eastbound at Pinole Valley Rd. bottleneck, saw a 2% increase in total delay, increasing from 41,600 to 42,600 vehicle hours of delay. Rank 8 (previously Rank 6 in Q4 2020), CC I680 Northbound at Buskirk Ave. bottleneck, saw a -15% decrease in total delay, decreasing from 47,100 to 39,800 vehicle hours of delay.

The remaining bottleneck locations are as follows:

- SCL US101 Southbound at N 13th St-Oakland Rd. during PM period (Rank 6): Was ranked 12 last quarter.
- SF US101 Northbound at 20th Street – Hospital Curve PM period (Rank 9): Was ranked 15 last quarter.
- ALA SR24 Eastbound at Broadway during PM period (Rank 10): Was Rank 16 last quarter.

Even though city, county, and state leaders placed lesser restrictive COVID-19 tiers on business operations, the activity across our counties during this first quarter were seen to have decreases in delays at most locations. On the Congestion by Route table, 16 out of the 48 Route Counties listed had increases in congestion from a quarter ago.

Regarding vehicle detector health, there was a 0.2% increase in the number of good working detector and 1% increase in the number of bad detectors over last quarter that are no longer able to capture the congestion.

An issue with the PeMS assigned length per VDS affected 55 out of 108 VDSs on NB 101 between postmile 0.21 to 21.23 in Sonoma County. The affected VDSs had an average PeMS assigned length of 2.52 miles versus 0.40 miles for the Average Calculated VDS length for the same section. The adjustments to VMT and VHD were only made to correct the Sonoma 101 freeway totals, Sonoma County totals, and District total.

Top Ten Bottlenecks for the 2021 1st Quarter:

Rank	County	Fwy	Approximate Location	Shift	Abs PM	CA PM	Avg Extent (miles)	Total Delay (veh-hrs)	Total Duration (mins)	# of active days	Latitude	Longitude
1	Alameda	I80-E	Gilman St	PM	12.0	6.64	3.7	88,700	6,800	61	37.87816	-122.30721
2	Alameda	I580-E	4000' E of Greenville Rd	PM	23.6	R7.55	3.5	63,000	6,200	58	37.72043	-121.68748
3	Santa Clara	US101-S	Burnett Ave	PM	368.1	R18.8	2.6	55,600	11,800	57	37.16338	-121.66442
4	Sonoma	US101-N	E Washington St	PM	472.5	4.95	5.0	53,300	8,500	51	38.24848	-122.63064
5	Solano	SR12-E	Red Top Rd-Rte 4	PM	38.6	2.41	5.1	48,200	10,600	57	38.20766	-122.15707
6	Santa Clara	US101-S	N 13th St-Oakland Rd	PM	387.3	37.61	3.2	46,000	14,700	61	37.36271	-121.88943
7	Contra Costa	I80-E	Pinole Valley Rd	PM	21.9	8.59	2.9	42,600	5,500	54	37.99801	-122.28511
8	Contra Costa	I680-N	Buskirk Ave	PM	48.3	16.8	3.2	39,800	4,600	58	37.93261	-122.06009
9	San Francisco	US101-N	20th Street - Hospital Curve	PM	432.1	3.8	1.5	39,800	9,100	49	37.76003	-122.40623
10	Alameda	SR24-E	Broadway	PM	3.8	5.63	2.8	36,800	8,700	57	37.85316	-122.22165

Measure	Graph	Percentage Change									
Vehicle Miles of Travel (VMT)	<p>Miles (Billions)</p> <table border="1"> <caption>Vehicle Miles of Travel (VMT) - Miles (Billions)</caption> <thead> <tr> <th>Period</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q1</td> <td>6.9</td> </tr> <tr> <td>2020 Q4</td> <td>6.5</td> </tr> <tr> <td>2021 Q1</td> <td>6.2</td> </tr> </tbody> </table>	Period	Value	2020 Q1	6.9	2020 Q4	6.5	2021 Q1	6.2	Over one year ago	Over last quarter
		Period	Value								
		2020 Q1	6.9								
2020 Q4	6.5										
2021 Q1	6.2										
-9.5%	-4.8%										
Total Vehicle Hours of Delay (VHD) at 35 mph	<p>Hours (Millions)</p> <table border="1"> <caption>Total Vehicle Hours of Delay (VHD) at 35 mph - Hours (Millions)</caption> <thead> <tr> <th>Period</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q1</td> <td>6.8</td> </tr> <tr> <td>2020 Q4</td> <td>2.6</td> </tr> <tr> <td>2021 Q1</td> <td>2.4</td> </tr> </tbody> </table>	Period	Value	2020 Q1	6.8	2020 Q4	2.6	2021 Q1	2.4	Over one year ago	Over last quarter
		Period	Value								
		2020 Q1	6.8								
2020 Q4	2.6										
2021 Q1	2.4										
-65.3%	-7.2%										
Average Non-Holiday Weekday Vehicle Hours of Delay (VHD) at 35 mph	<p>Hours (Thousands)</p> <table border="1"> <caption>Average Non-Holiday Weekday Vehicle Hours of Delay (VHD) at 35 mph - Hours (Thousands)</caption> <thead> <tr> <th>Period</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q1</td> <td>96</td> </tr> <tr> <td>2020 Q4</td> <td>38</td> </tr> <tr> <td>2021 Q1</td> <td>35</td> </tr> </tbody> </table>	Period	Value	2020 Q1	96	2020 Q4	38	2021 Q1	35	Over one year ago	Over last quarter
		Period	Value								
		2020 Q1	96								
2020 Q4	38										
2021 Q1	35										
-63.4%	-6.5%										
Total Vehicle Hours of Delay (VHD) at 60 mph	<p>Hours (Millions)</p> <table border="1"> <caption>Total Vehicle Hours of Delay (VHD) at 60 mph - Hours (Millions)</caption> <thead> <tr> <th>Period</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q1</td> <td>14.2</td> </tr> <tr> <td>2020 Q4</td> <td>7.3</td> </tr> <tr> <td>2021 Q1</td> <td>7.2</td> </tr> </tbody> </table>	Period	Value	2020 Q1	14.2	2020 Q4	7.3	2021 Q1	7.2	Over one year ago	Over last quarter
		Period	Value								
		2020 Q1	14.2								
2020 Q4	7.3										
2021 Q1	7.2										
-49.3%	-1.6%										
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		Period	Value								
		2020 Q1	205								
2020 Q4	109										
2021 Q1	105										
-49%	-4.3%										

Measure	Graph	Percentage Change	
<p>Average Vehicle Hours of Delay by Day of Week at 60 mph</p>		<p>Largest Magnitude Decrease over one year ago</p>	<p>Largest Magnitude Decrease over last quarter</p>
		<p>Wednesday -55% </p>	<p>Monday -11.9% </p>
		<p>Largest Magnitude Increase over one year ago</p>	<p>Largest Magnitude Increase over last quarter</p>
		<p>-</p>	<p>Saturday 6.5% </p>
<p>Average Vehicle Hours of Delay by Hour of Day at 35 mph, Weekdays</p>		<p>Largest Magnitude Weekday Decrease over one year ago</p>	<p>Largest Magnitude Weekday Decrease over last quarter</p>
		<p>8 AM -87.9% </p>	<p>6 PM -17.2% </p>
		<p>Largest Magnitude Weekday Increase over one year ago</p>	<p>Largest Magnitude Weekday Increase over last quarter</p>
		<p>-</p>	<p>7 AM 20.6% </p>
<p>Average Vehicle Hours of Delay by Hour of Day at 35 mph, Saturdays</p>		<p>Largest Magnitude Saturday Decrease over one year ago</p>	<p>Largest Magnitude Saturday Decrease over last quarter</p>
		<p>5 PM -68.5% </p>	<p>8 PM -50.9% </p>
		<p>Largest Magnitude Saturday Increase over one year ago</p>	<p>Largest Magnitude Saturday Increase over last quarter</p>
		<p>2 AM 17.2% </p>	<p>12 PM 28.8% </p>
<p>Average Vehicle Hours of Delay by Hour of Day at 35 mph, Sundays/Holidays</p>		<p>Largest Magnitude Sun./Holiday Decrease over one year ago</p>	<p>Largest Magnitude Sun./Holiday Decrease over last quarter</p>
		<p>2 PM -70% </p>	<p>5 PM -43.2% </p>
		<p>Largest Magnitude Sun./Holiday Increase over one year ago</p>	<p>Largest Magnitude Sun./Holiday Increase over last quarter</p>
		<p>-</p>	<p>1 PM 36.7% </p>

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
		Santa Clara -83.9% ↓	Alameda -12.2% ↓
		Largest Magnitude Increase over one year ago	Largest Magnitude Increase over last quarter
			San Francisco 9.6% ↑
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
		AM Peak -85.3% ↓	PM Peak -9% ↓
		Largest Magnitude Increase over one year ago	Largest Magnitude Increase over last quarter
		Off-Peak Night 18.9% ↑	AM Peak 6.2% ↑
Average Number of Good and Bad Detectors		Change in Good over one year ago	Change in Good over last quarter
		-10% ↓	0% ↑
		Change in Bad over one year ago	Change in Bad over last quarter
		19% ↑	1% ↑

Congestion by Route											
Route	County	Vehicle Hours of Delay at 35 mph			Difference 2021 Q1-2020 Q1		Difference 2021 Q1-2020 Q4		Rank		
		2020 Q1	2020 Q4	2021 Q1	Absolute	Percentage	Absolute	Percentage	2020 Q1	2020 Q4	2021 Q1
I580	Alameda	656,079	399,389	365,797	(290,282)	-44%	(33,592)	-8%	2	1	1
I80	Alameda	457,262	271,652	257,098	(200,165)	-44%	(14,554)	-5%	5	3	2
I880	Alameda	550,838	305,063	248,643	(302,195)	-55%	(56,421)	-18%	3	2	3
US101	Santa Clara	664,198	221,125	225,944	(438,254)	-66%	4,819	2%	1	4	4
I80	Solano	214,471	180,779	163,934	(50,537)	-24%	(16,845)	-9%	12	5	5
US101	San Francisco	248,538	148,154	146,038	(102,500)	-41%	(2,116)	-1%	9	6	6
I80	Contra Costa	228,363	108,801	110,411	(117,952)	-52%	1,610	1%	10	7	7
SR4	Contra Costa	212,330	95,254	86,480	(125,850)	-59%	(8,775)	-9%	13	8	8
SR12	Solano	63,915	72,101	75,944	12,029	19%	3,843	5%	28	9	9
I680	Contra Costa	221,230	71,289	75,707	(145,523)	-66%	4,419	6%	11	10	10
SR92	Alameda	127,135	63,394	61,739	(65,395)	-51%	(1,654)	-3%	17	13	11
US101	Sonoma	114,997	63,316	58,586	(56,410)	-49%	(4,730)	-7%	20	14	12
SR24	Contra Costa	192,892	65,449	57,488	(135,405)	-70%	(7,962)	-12%	14	12	13
I80	San Francisco	74,693	38,414	52,654	(22,039)	-30%	14,240	37%	26	17	14
US101	San Mateo	300,152	70,033	47,689	(252,463)	-84%	(22,344)	-32%	7	11	15
SR242	Contra Costa	70,169	48,936	47,523	(22,646)	-32%	(1,412)	-3%	27	15	16
SR24	Alameda	52,617	27,124	33,120	(19,498)	-37%	5,996	22%	29	20	17
I280	Santa Clara	337,196	24,356	29,785	(307,411)	-91%	5,429	22%	6	21	18
SR17	Santa Clara	43,712	28,640	23,720	(19,992)	-46%	(4,920)	-17%	32	19	19
I680	Santa Clara	125,545	19,272	22,481	(103,064)	-82%	3,209	17%	18	22	20
SR85	Santa Clara	507,723	35,339	22,004	(485,720)	-96%	(13,335)	-38%	4	18	21
SR1	San Francisco	51,482	11,873	20,375	(31,107)	-60%	8,502	72%	31	28	22
SR238	Alameda	89,742	17,948	19,179	(70,563)	-79%	1,231	7%	25	24	23
I580	Contra Costa	34,087	18,432	17,680	(16,406)	-48%	(751)	-4%	33	23	24
US101	Marin	52,386	11,888	13,608	(38,778)	-74%	1,721	14%	30	27	25
I680	Alameda	93,572	45,691	13,469	(80,104)	-86%	(32,222)	-71%	24	16	26
SR92	San Mateo	129,136	15,601	12,662	(116,474)	-90%	(2,939)	-19%	16	25	27
I280	San Mateo	106,766	10,637	12,348	(94,418)	-88%	1,711	16%	22	30	28
SR237	Santa Clara	270,471	7,432	10,902	(259,569)	-96%	3,470	47%	8	32	29
SR12	Napa	24,955	10,717	9,523	(15,432)	-62%	(1,195)	-11%	35	29	30
SR87	Santa Clara	120,415	7,830	9,268	(111,147)	-92%	1,438	18%	19	31	31
I880	Santa Clara	138,075	6,697	9,169	(128,906)	-93%	2,472	37%	15	34	32
I580	Marin	2,921	7,401	6,261	3,340	114%	(1,140)	-15%	40	33	33
I280	San Francisco	101,367	5,050	3,978	(97,389)	-96%	(1,072)	-21%	23	35	34
SR37	Sonoma	26,357	3,561	2,995	(23,362)	-89%	(566)	-16%	34	38	35
SR152	Santa Clara	10,057	4,529	2,865	(7,193)	-72%	(1,665)	-37%	37	36	36
SR25	Santa Clara	6,257	4,010	2,774	(3,483)	-56%	(1,236)	-31%	39	37	37
I680	Solano	16,484	12,589	1,780	(14,704)	-89%	(10,809)	-86%	36	26	38
I780	Solano	249	147	383	134	54%	237	161%	42	42	39
SR37	Solano	111,941	362	298	(111,643)	-100%	(64)	-18%	21	41	40
I980	Alameda	7,253	2,437	141	(7,113)	-98%	(2,296)	-94%	38	39	41
I80	Napa	47	491	65	19	40%	(425)	-87%	43	40	42
SR13	Alameda	18	20	17	(1)	-5%	(3)	-14%	44	45	43
I880S	Alameda	12	13	11	(1)	-8%	(2)	-14%	45	47	44
SR156	Santa Clara	-	18	1	1		(17)	-94%		46	45
SR37	Marin	276	79	0	(276)	-100%	(79)	-100%	41	43	46
SR160	Contra Costa	-	-	-	-		-				
SR29	Napa	-	42	-	-		(42)	-100%		44	
TOTALS		6,858,380	2,563,371	2,382,537	-4,475,843	-65.3%	-180,835	-7.1%			