

District 04 Mobility Performance Report

2021 4th Quarter

DEPARTMENT OF TRANSPORTATION

January 31, 2022
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 4th 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. During Q3 2020 businesses were allowed to reopen if their county's COVID-19 reopening criteria were met, but it was still the early stages of the COVID-19 Pandemic. By Q4 2020, traffic levels started to stabilize. A full two years and three months has passed since SIP took effect. To combat the pandemic, vaccinations are being administered to all eligible individuals based on state guidelines. On June 15th, 2021, California State Governor Gavin Newsom announced the reopening of California. There was a 10.5% increase in VMT compared to the same quarter a year ago, with VMT increasing from 6.5 billion in Q4 2020 to 7.2 billion in Q4 2021. In the fourth quarter, we see a decrease of 1.9% (143 million) in VMT from the previous quarter's VMT of 7.4 billion.

Increases are not only seen in VMT, but also in VHD. Compared to the same quarter the year before, there was a 95.1% increase from 2.6 million to 5 million in the 35 mph total quarterly delay, and a 65.2% increase from 7.3 million to 12.1 million VHD in the 60 mph total quarterly delay.

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 38 thousand VHD at 35 mph, and 109 thousand VHD at 60 mph. Whereas this quarter, there was a delay of 65 thousand VHD at 35 mph, and 157 thousand VHD at 60 mph. Thursday was the most congested day of the week in Q4 dissimilarly to the same quarter a year ago and the previous quarter where Friday was the most congested day of the week. Thursday had the largest magnitude increase of 74 thousand which was a 66% increase from the same quarter last year. Thursday had the largest magnitude increase of 21 thousand (13%) compared to last quarter.

Looking at the Average VHD at 35 mph by hour of the day for weekdays, there was a significant increase 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 an increase of 404.4%. The largest magnitude weekday decrease over last quarter occurred at 2 PM with a decrease of -9.9%. For the PM hours, the largest magnitude increase of 61.9% occurred at 5 PM

compared to the same quarter last year, and the largest magnitude increase of 11.6% occurred at 5 PM compared to last quarter. The PM commute period has increased compared to the previous quarter where the average VHD during the PM peak hour of 5 PM increased to, 12,500 thousand VHD from, 11,200 thousand VHD the quarter before. The largest single hour decrease on Saturday compared to a year ago occurred at 6 AM with a -37.6% change, over last quarter occurred at 1 PM of -36.8%. The largest single hour increase on Saturday compared to a year ago occurred at 5 PM of 193%, and over last quarter an increase of 60.32% occurred at 6 PM. As for the Sunday/Holidays, the largest magnitude decrease over a year ago is -39.5% at 10 PM, and over last quarter -47.6% at 1 PM. The largest magnitude increase over a year ago is 137.4% at 5 PM, over last quarter occurred at 5 PM of 54.4%.

Alameda County with 2,034,000 vehicle hours of total delay at 35 mph during the fourth quarter was the most congested county in the District. Contra Costa County with 914,000 vehicle hours of total delay at 35 mph was the second most congested county in the District. Santa Clara County with 889,000 vehicle hours of total delay at 35 mph was the third most congested county in the District. Alameda County experienced the largest magnitude increase of 80.5% compared to the same quarter last year, and Contra Costa County experienced the largest magnitude increase of 13.3% compared to last quarter.

From the Top 10 Bottlenecks for the 4th Quarter, nine bottleneck locations occurred during the PM, and one bottleneck location occurred in the AM period. The top three locations are as follows:

- CC I80 Eastbound at Pinole Valley Rd during PM period (Rank 1, previously ranked 1 in Q3 2021): 165,900 vehicle hours of delay
- ALA I80 Eastbound at W of Buchanan St during PM period (Rank 2, previously ranked 2 in Q3 2021): 139,500 vehicle hours of delay
- ALA I880 Northbound at Winton Ave during PM period (Rank 3, previously ranked 5 in Q3 2021): 101,943 vehicle hours of delay

This quarter, there are eight locations that have resurfaced from last quarter's top 10 bottleneck list. Rank 1 (previously Rank 1 in Q3 2021), ALA I80 Eastbound at Pinole Valley Rd

increased 12.8% from 147,100 to 165,900 VHD. Rank 2 (previously Rank 2 in Q3 2021), ALA I80 Eastbound at W of Buchanan St increased 34.8% from 103,500 to 139,500 VHD. Rank 3 (previously Rank 5 in Q3 2021), ALA I880 Northbound at Winton Ave increased 42.3% from 79,600 to 101,900 VHD. Rank 4 (previously Rank 9 in Q3 2021), CC SR4 Westbound at Willow Pass Rd increased 103.8% from 47,100 to 96,000 VHD. Rank 5 (previously rank 3 in Q3 2021), SCL US101 Southbound at Laurel Rd remained unchanged from the previous quarter with 78,500 VHD. Rank 6 (previously Rank 7 in Q3 2021), ALA I80 Westbound at Powell St increased 5% from 59,200 to 62,200 VHD. Rank 7 (previously Rank 8 in Q3 2021), SOL SR12 Eastbound at Red Top Rd increased 6% from 52,100 to 55,200 VHD. Rank 8 (previously Rank 4 in Q3 2021), ALA I580 Eastbound at Greenville Rd decreased 27.8% from 74,600 to 53,800 VHD.

The remaining bottleneck locations are as follows:

- SCL US101 Southbound at N 13th-Oakland Rd during PM period (Rank 9): Was ranked 13 last quarter.
- ALA I80 Westbound at Gilman St during AM period (Rank 10): Was ranked 20 last quarter.

The activity across our counties during this fourth quarter were seen to have increases in delays at about half of the locations. On the Congestion by Route table, 23 out of the 47 Route Counties listed had increases in congestion compared to a quarter ago and 24 show decrease.

Regarding vehicle detector health, there was a -4.4% decrease in the number of good working detector and 5% 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 prior to 6/24/2021 (2021 Qtr 2). 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.

The error was resolved and adjustments are no longer needed for data starting 2021 Qtr 3 and onward.

Top Ten Bottlenecks for the 2021 4th 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	Contra Costa	I80-E	Pinole Valley Rd rm-e-diag	PM	21.9	8.59	5.9	165,897	202	58	37.99801	-122.28511
2	Alameda	I80-E	W of Buchanan St	PM	12.3	R6.98	4.0	139,539	152	61	37.87816	-122.30721
3	Alameda	I880-N	Winton Ave rm-n-coll	PM	28.0	17.82	6.5	101,942	79	61	37.65927	-122.10306
4	Contra Costa	SR4-W	Willow Pass Rd	AM	16.8	R17.16	6.4	95,976	153	52	38.01617	-121.99243
5	Santa Clara	US101-S	Laurel Rd	PM	366.5	17.16	5.5	78,465	179	58	37.14532	-121.64531
6	Alameda	I80-W	Powell St	PM	9.2	3.9	2.9	62,192	211	61	37.83967	-122.297
7	Solano	SR12-E	1-2 mi W of Red Top Rd	PM	38.1	1.94	2.4	55,243	191	35	37.85316	-122.22165
8	Alameda	I580-E	2.34 miles E of Greenville Rd	PM	23.6	R7.55	2.6	53,839	110	53	37.72043	-121.68748
9	Santa Clara	US101-S	N 13th St-Oakland Rd	PM	387.3	37.61	1.7	52,367	240	62	37.36271	-121.88943
10	Alameda	I80-W	Gilman St	AM	11.9	6.6	2.9	51,889	79	51	37.87741	-122.30724

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>Quarter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q4</td> <td>6.5</td> </tr> <tr> <td>2021 Q3</td> <td>7.4</td> </tr> <tr> <td>2021 Q4</td> <td>7.2</td> </tr> </tbody> </table>	Quarter	Value	2020 Q4	6.5	2021 Q3	7.4	2021 Q4	7.2	Over one year ago	Over last quarter
		Quarter	Value								
		2020 Q4	6.5								
2021 Q3	7.4										
2021 Q4	7.2										
10.5%	-1.9%										
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>Quarter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q4</td> <td>2.6</td> </tr> <tr> <td>2021 Q3</td> <td>4.9</td> </tr> <tr> <td>2021 Q4</td> <td>5</td> </tr> </tbody> </table>	Quarter	Value	2020 Q4	2.6	2021 Q3	4.9	2021 Q4	5	Over one year ago	Over last quarter
		Quarter	Value								
		2020 Q4	2.6								
2021 Q3	4.9										
2021 Q4	5										
95.1%	2.7%										
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>Quarter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q4</td> <td>38</td> </tr> <tr> <td>2021 Q3</td> <td>61</td> </tr> <tr> <td>2021 Q4</td> <td>65</td> </tr> </tbody> </table>	Quarter	Value	2020 Q4	38	2021 Q3	61	2021 Q4	65	Over one year ago	Over last quarter
		Quarter	Value								
		2020 Q4	38								
2021 Q3	61										
2021 Q4	65										
72.6%	7.4%										
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>Quarter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2020 Q4</td> <td>7.3</td> </tr> <tr> <td>2021 Q3</td> <td>11.8</td> </tr> <tr> <td>2021 Q4</td> <td>12.1</td> </tr> </tbody> </table>	Quarter	Value	2020 Q4	7.3	2021 Q3	11.8	2021 Q4	12.1	Over one year ago	Over last quarter
		Quarter	Value								
		2020 Q4	7.3								
2021 Q3	11.8										
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65.2%	2.8%										
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		Quarter	Value								
		2020 Q4	109								
2021 Q3	151										
2021 Q4	157										
43.1%	3.5%										

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>* -10.3%</p>	<p>Largest Magnitude Decrease over last quarter</p> <p>Monday -10.3% ↓</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>9 PM -21.1% ↓</p>	<p>Largest Magnitude Weekday Decrease over last quarter</p> <p>2 PM -9.9% ↓</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>6 AM -37.6% ↓</p>	<p>Largest Magnitude Saturday Decrease over last quarter</p> <p>1 PM -36.8% ↓</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>10 PM -27.9% ↓</p>	<p>Largest Magnitude Sun./Holiday Decrease over last quarter</p> <p>1 PM -47.6% ↓</p>
<p>Largest Magnitude Increase over one year ago</p> <p>Thursday 66% ↑</p>		<p>Largest Magnitude Increase over last quarter</p> <p>Thursday 13.1% ↑</p>	
<p>Largest Magnitude Weekday Increase over one year ago</p> <p>8 AM 404.4% ↑</p>		<p>Largest Magnitude Weekday Increase over last quarter</p> <p>8 AM 27.4% ↑</p>	
<p>Largest Magnitude Saturday Increase over one year ago</p> <p>5 PM 193.1% ↑</p>		<p>Largest Magnitude Saturday Increase over last quarter</p> <p>6 PM 60.3% ↑</p>	
<p>Largest Magnitude Sun./Holiday Increase over one year ago</p> <p>5 PM 137.4% ↑</p>		<p>Largest Magnitude Sun./Holiday Increase over last quarter</p> <p>5 PM 54.4% ↑</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
		Alameda 80.5% ↑	Contra Costa 13.3% ↑
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
		PM Peak 53.2% ↑	Off-Peak Day -3.3% ↓
Average Number of Good and Bad Detectors		Change in Good over one year ago	Change in Good over last quarter
		Change in Bad over one year ago	Change in Bad over last quarter

Congestion by Route											
Route	County	Vehicle Hours of Delay at 35 mph			Difference 2021 Q4-2020 Q4		Difference 2021 Q4-2021 Q3		Rank		
		2020 Q4	2021 Q3	2021 Q4	Absolute	Percentage	Absolute	Percentage	2020 Q4	2021 Q3	2021 Q4
I880	Alameda	305,063	606,630	729,488	424,425	139%	122,858	20%	2	1	1
I80	Alameda	271,652	494,460	480,428	208,777	77%	(14,032)	-3%	3	3	2
I580	Alameda	399,389	605,700	480,419	81,030	20%	(125,282)	-21%	1	2	3
US101	Santa Clara	221,125	475,305	416,170	195,045	88%	(59,135)	-12%	4	4	4
I80	Contra Costa	108,801	224,562	264,680	155,879	143%	40,118	18%	7	6	5
I680	Contra Costa	71,289	144,310	188,850	117,561	165%	44,540	31%	10	9	6
I80	Solano	180,779	173,539	180,023	(756)	0%	6,483	4%	5	8	7
US101	San Francisco	148,154	236,500	169,781	21,627	15%	(66,719)	-28%	6	5	8
SR4	Contra Costa	95,254	187,416	161,740	66,486	70%	(25,676)	-14%	8	7	9
US101	San Mateo	70,033	80,943	136,058	66,025	94%	55,115	68%	11	20	10
I280	Santa Clara	24,356	86,111	119,549	95,192	391%	33,438	39%	21	17	11
SR37	Solano	362	114,467	116,516	116,155	32105%	2,049	2%	41	11	12
SR24	Contra Costa	65,449	82,101	113,565	48,115	74%	31,463	38%	12	19	13
SR85	Santa Clara	35,339	83,510	104,662	69,323	196%	21,152	25%	18	18	14
I580	Contra Costa	18,432	89,909	100,780	82,349	447%	10,871	12%	23	15	15
SR92	Alameda	63,394	95,591	90,852	27,459	43%	(4,739)	-5%	13	13	16
US101	Sonoma	63,316	117,542	90,124	26,808	42%	(27,418)	-23%	14	10	17
US101	Marin	11,888	79,428	90,032	78,144	657%	10,603	13%	27	21	18
SR242	Contra Costa	48,936	78,203	84,458	35,522	73%	6,255	8%	15	22	19
I80	San Francisco	38,414	91,590	80,681	42,267	110%	(10,909)	-12%	17	14	20
SR238	Alameda	17,948	76,053	73,599	55,651	310%	(2,454)	-3%	24	23	21
I680	Alameda	45,691	51,627	72,898	27,207	60%	21,272	41%	16	26	22
SR12	Solano	72,101	112,321	64,353	(7,747)	-11%	(47,967)	-43%	9	12	23
SR84	Alameda	-	-	61,943	61,943		61,943				24
I880	Santa Clara	6,697	42,657	56,910	50,214	750%	14,253	33%	34	27	25
SR1	San Francisco	11,873	88,393	56,564	44,691	376%	(31,829)	-36%	28	16	26
I680	Santa Clara	19,272	27,004	52,435	33,162	172%	25,431	94%	22	31	27
SR24	Alameda	27,124	54,964	47,119	19,996	74%	(7,844)	-14%	20	25	28
SR237	Santa Clara	7,432	26,076	42,560	35,128	473%	16,484	63%	32	32	29
SR92	San Mateo	15,601	27,832	39,269	23,667	152%	11,437	41%	25	29	30
I580	Marin	7,401	18,123	38,639	31,238	422%	20,516	113%	33	34	31
I280	San Mateo	10,637	2,526	38,317	27,680	260%	35,791	1417%	30	39	32
SR87	Santa Clara	7,830	38,591	38,293	30,463	389%	(298)	-1%	31	28	33
SR17	Santa Clara	28,640	68,320	32,252	3,612	13%	(36,067)	-53%	19	24	34
SR152	Santa Clara	4,529	27,630	22,216	17,687	390%	(5,414)	-20%	36	30	35
SR12	Napa	10,717	22,604	16,789	6,071	57%	(5,816)	-26%	29	33	36
I280	San Francisco	5,050	9,371	16,605	11,555	229%	7,234	77%	35	37	37
I680	Solano	12,589	5,263	8,261	(4,327)	-34%	2,999	57%	26	38	38
SR37	Sonoma	3,561	12,814	8,014	4,453	125%	(4,800)	-37%	38	35	39
SR25	Santa Clara	4,010	10,389	4,295	285	7%	(6,094)	-59%	37	36	40
SR37	Marin	79	129	235	155	196%	106	82%	43	43	41
I80	Napa	491	312	142	(349)	-71%	(170)	-55%	40	42	42
I780	Solano	147	7	113	(34)	-23%	106	1556%	42	46	43
SR156	Santa Clara	18	426	108	90	499%	(317)	-75%	46	40	44
I980	Alameda	2,437	339	81	(2,356)	-97%	(258)	-76%	39	41	45
SR13	Alameda	20	20	18	(1)	-7%	(1)	-7%	45	44	46
I880S	Alameda	13	13	12	(1)	-7%	(1)	-7%	47	45	47
SR160	Contra Costa	-	-	-	-		-				
SR29	Napa	42	-	-	(42)	-100%	-		44		
TOTALS		2,563,371	4,871,616	4,990,894	2,427,523	94.7%	119,278	2.4%			