

# Section 2

## Summary of Revisions to the Traffic Analysis

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### 2.1 INTRODUCTION

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This section identifies changes and additions to the *Traffic Study for San Leandro Kaiser Medical Center plus Mixed-Use Retail Development* (Dowling Associates, January 22, 2010) that was previously incorporated into the Draft EIR by reference. This section summarizes for the decision makers and the public the changes that have been made to the traffic study and incorporated into the EIR as a result of public comments and staff-initiated revisions.

These revisions include changes to the Baseline plus Kaiser Medical Center Phase 1 Traffic Volumes; I-880 Southbound Ramps intersection; and the Marina Boulevard/New Signalized Mixed-Use Retail Development Driveway intersection. In addition, a number of comments were raised regarding queuing impacts along Marina Boulevard and Merced Street. The revised queuing tables are presented at the end of this section for reference. The revisions to the traffic analysis are provided in the *Revised Traffic Study for San Leandro Kaiser Medical Center plus Mixed-Use Retail Development* (Dowling Associates, April 6, 2010), and summarized in this section. The revised traffic study is incorporated into this Final EIR by reference, and available for review on the City's website, and at the City's Planning Services Department during regular business hours. Text changes to the Draft EIR related to these revisions are shown in Section 4, Revisions to the Draft EIR. No new substantial environmental impact and no increase in the severity of an earlier identified traffic impact have resulted from these revisions.

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### 2.2 REVISIONS TO THE TRAFFIC ANALYSIS

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#### **Baseline plus Kaiser Medical Center Phase 1 Traffic Volumes**

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The traffic volumes and analysis have been revised for the Baseline plus Kaiser Medical Center Phase 1 conditions to adjust incorrect volumes previously reported in the traffic study and Draft EIR.

**Inbound Kaiser Medical Center Vehicle Trips.** In preparing the responses to the public comments (Comment 9-1), it was discovered that the traffic study had overstated the total inbound project traffic volumes for the southbound left-turn lane at the Merced Street/Republic Avenue intersection. The error was discovered when the inbound traffic volumes at the project driveways (including the Merced Street/Republic Avenue intersection) were compared to the total inbound project trip generation shown in Table 3.9-14 on page 3.9-42 of the Draft EIR. When compared, the total PM peak hour inbound traffic was 621 vehicles per hour (vph) at all the project driveways, while the total PM peak hour inbound trip generation was 421 vph. This inconsistency was observed for all the time periods (AM,

PM, and Saturday peak hours), but the PM peak was the most affected. This inconsistency only affected the Baseline plus Kaiser Medical Center Phase 1 conditions.

The traffic study has been revised to correct the inbound volumes at all project driveways and at corresponding upstream intersections for all three time periods, which has resulted in reduced traffic at many study intersections. The revised analysis resulted in slightly improved level of service results at most study intersections, and substantially improved results at the Merced Street/Republic Avenue and Marina Boulevard /Merced Street intersections. However, one queuing impact identified at the southbound left-turn at the Merced Street/Republic Avenue driveway was reduced to less than significant and did not require implementation of Mitigation Measures TR-1.2 or TR-1.3, which were previously proposed for this intersection under Baseline plus Kaiser Medical Center Phase 1 conditions in the Draft EIR. Corrected results are provided in the updated figures, tables, text in the revised traffic study and calculation sheets are provided in the amended technical appendix. Revised figures, tables, and text in the Draft EIR related to these changes are shown in Section 4, Revisions to the Draft EIR. The correction did not result in any new or substantially more severe impacts to the study intersections nor did it require any new mitigation measures. However, it should be noted that Mitigation Measures TR-1.2 or TR-1.3 would still be required to mitigate significant impacts to the Marina Boulevard/Merced Street and the Republic Avenue/Merced Street intersections under Baseline plus Kaiser Medical Center Phase 1 plus Mixed-Use Retail Development conditions and all cumulative with project conditions. Therefore, only the timing of these mitigation measures has changed.

**Project Site Driveway on Marina Boulevard.** In preparing the responses to the public comments (Comment 9-1), it was discovered that the traffic study had an incorrect assumption that the project under Baseline plus Kaiser Medical Center Phase 1 conditions would allow for project trips to access the site through an existing right-in and right-out driveway on eastbound Marina Boulevard just west of I-880. This was an incorrect assumption for the Baseline plus Kaiser Medical Center Phase 1 conditions, since without development on the northern parcel, there would be no roadway connecting the Kaiser Medical Center to this access point. (Note there are existing roadways through the northern parcel to this access point; however, they would not be accessible for future Kaiser Medical Center employees or members.) No other analysis conditions, such as Baseline plus Kaiser Medical Center Phase 1 plus Mixed-Use Retail Development or cumulative conditions, were affected since all other conditions would include the Mixed-Use Retail Development, and this development would include connection to the existing driveway as a right-in and right-out access.

The PM peak hour was the most affected condition, but the error was observed for all three study time periods. Without the Marina Boulevard entrance during the Baseline plus Kaiser Medical Center Phase 1 conditions, a corresponding correction had to be made to the traffic analysis to remove the traffic volumes exiting at the right-in and right-out access at Marina Boulevard and reroute these vehicles to exit the project site at the Merced Street/Republic Avenue driveway. This correction resulted in minor increases to traffic volumes at three intersections – Merced Street/Republic Avenue, Merced Street/Wells Fargo Driveway, and Marina Boulevard/Merced Street intersections. The total PM peak hour trips resulting from this rerouting did not exceed 272 vehicles per hour. Based on the revised

analysis, this correction did not result in any new or substantially more severe impacts to the study intersections nor did it require any new mitigation measures. Corrected results are provided in the updated figures, tables, and text in the revised traffic study and calculation sheets are provided in the amended technical appendix. Revised Figures 3.9-10 and 3.9-11, Table 3.9-15, and corresponding text revisions related to these changes are shown in Section 4, Revisions to the Draft EIR.

### **Marina Boulevard/I-880 Southbound Ramps Intersection**

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**Third Right-Turn Lane.** In preparing responses to the public comments (Comment 10-4) regarding the mitigation of a third right-turn lane to the I-880 southbound off-ramp, it was noticed in the traffic study that some analysis conditions had incorrectly assumed the addition of a third southbound right-turn lane to the mitigated scenarios. While this mitigation was required for the Cumulative plus Kaiser Medical Center Phase 1 plus Mixed-Use Retail Development conditions for Saturday peak hour without Aladdin Avenue Extension, and for Cumulative plus Kaiser Medical Center Build-Out plus Mixed-Use Retail Development conditions, this mitigation was not required for other scenarios. The corrections are provided in the tables in the revised traffic study and the calculation sheets in the technical appendix. Revised tables and text in the Draft EIR related to these changes are shown in Section 4, Revisions to the Draft EIR. The correction to the mitigated analysis did not impact the results substantially nor did it introduce any new impacts.

**Revised Mitigation Measure TR-1.3.** In preparing responses to the agency comments (Comment 1-4) a revised analysis was required for the Marina Boulevard/I-880 Southbound Ramps intersection to address safety concerns. Due to the close proximity between the proposed new signalized driveway on Marina Boulevard (Mitigation Measure TR-1.3 on pages 3.9-59 through 3.9-61 of the Draft EIR) and the reconfigured I-880 Marina Boulevard/Southbound Ramps intersection, right-turns on red would be prohibited from the I-880 southbound off-ramp onto Marina Boulevard. The prohibition would minimize conflicts between southbound off-ramp vehicles turning right onto Marina Boulevard and desiring to enter the new left-turn lane at the Marina Boulevard/New Signalized Mixed-Use Retail Development Driveway intersection and westbound through vehicles on Marina Boulevard. With this no right-turn on red condition, westbound through traffic on Marina Boulevard would be stopped while the southbound right-turn movement proceeds. Therefore, there would not be any conflict during this signal phase that may cause an unsafe weaving condition. Mitigation Measure TR-1.3 has been revised to address these concerns. Revised tables and text related to the mitigated conditions under all study conditions are provided in the revised traffic study and calculation sheets are provided in the technical appendix. Revised tables and text in the Draft EIR related to these changes are shown in Section 4, Revisions to the Draft EIR. The correction to the mitigated analysis did not impact the results substantially nor did it introduce any new impacts.

### **Marina Boulevard/New Signalized Mixed-Use Retail Development Driveway Intersection**

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**Left-turn Lane Storage Capacity.** In preparing responses to the agency comments (Comment 1-4), it was noticed that the storage capacity for the westbound left-turn lane at the proposed Marina Boulevard

access driveway had been incorrectly assumed to be 400 feet. As described on page 3.9-29, in Section 3.9, Transportation, of the Draft EIR, the Baseline conditions assumed planned roadway improvements, including reconfiguration of the Marina Boulevard interchange at I-880 by 2015. This improvement would include reconfiguration of the existing interchange ramps and signalization of the ramp intersections at Marina Boulevard. At the time of the analysis, the design of this interchange reconfiguration had not been finalized, and as such, the Draft EIR used the best available information. The City of San Leandro, the Alameda County Congestion Management Agency, and Caltrans are in the process of selecting from potential alternatives being presented in the Project Study Report (PSR) for the I-880/Marina Boulevard Interchange. Analysis for the proposed project was first completed assuming an L-9 interchange design, which would have allowed for a storage distance of 400 feet for the westbound left-turn lane into the new signalized driveway along Marina Boulevard west of the interchange. However, as new information became available from a PSR process, the interchange design alternative being considered in the Draft EIR was revised to the modified existing interchange design with loop off-ramps terminating at signalized intersections. The new alternative configuration for the I-880/Marina Boulevard Interchange reduced the available storage distance at the new signalized driveway from 400 feet under the L-9 configuration to 252 feet under the modified existing interchange design. However, the storage capacity assumed in the Draft EIR for the left-turn lane at the new signalized driveway along Marina Boulevard was not revised to reflect this new configuration. Revised tables and text related to the queuing and available storage capacity at this intersection under all study conditions are provided in the revised traffic study and calculation sheets are provided in the amended technical appendix. Revised tables and text in the Draft EIR related to these changes are shown in Section 4, Revisions to the Draft EIR. The maximum queues for the westbound left-turn would not exceed the 252 feet of storage and therefore would not impact the adjacent intersection at the I-880 southbound off-ramp. Therefore, the correction to the storage capacity did not impact the results nor did it introduce any new impacts.

## **Revised Queuing Analysis**

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As noted above, a number of comments were raised regarding queuing impacts along Marina Boulevard and Merced Street. To address these concerns, the revised queuing tables (Tables 50 through 55, from the revised traffic study) are presented below for reference. For a discussion of the methodology for the queuing analysis and queuing impacts, refer to the *Revised Traffic Study for San Leandro Kaiser Medical Center plus Mixed-Use Retail Development* (Dowling Associates, April 6, 2010).

Note that the revised queuing tables, including the mitigated conditions, would result in some situations where the queue length would exceed the available storage capacity for the lane. In the mitigated scenarios, this would occur even when the intersection level of service has been mitigated to acceptable levels. These queuing impacts are considered operational impacts, not related to CEQA; therefore, no mitigation was proposed to address these issues in the Draft EIR.

**Table 50**  
**Queuing Analysis on Marina Boulevard and Merced Street – Baseline No Project**

Intersection			Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
10 Marina Boulevard/ Merced Street	Capacity		75	586	200	360	800	-	150	443	275	110	309	100
	AM		52	155	22	<b>m#335</b>	327	-	80	153	158	108	76	20
	PM		<b>#123</b>	213	30	<b>#322</b>	316	-	97	151	126	<b>#227</b>	80	<b>m11</b>
	Saturday		<b>75</b>	146	29	<b>#314</b>	328	-	<b>#106</b>	94	97	<b>#114</b>	57	16
13 Republic Avenue/ Merced Street	Capacity		-	-	-	-	-	-	-	-	-	-	-	-
	AM		-	-	-	-	-	-	-	-	-	-	-	-
	PM		-	-	-	-	-	-	-	-	-	-	-	-
	Saturday		-	-	-	-	-	-	-	-	-	-	-	-
15 Fairway Drive/ Merced Street	Capacity		240	385	200	230	1126	100	200	956	-	150	727	-
	AM		166	185	45	130	263	64	146	22	-	70	203	-
	PM		<b>#267</b>	255	36	99	206	46	155	291	-	96	158	-
	Saturday		131	150	35	78	153	38	110	205	-	72	228	-
20 Marina Boulevard/ I-880 SB Ramps	Capacity		-	800	800	420	920	-	-	-	-	-	-	450
	AM		-	373	9	119	299	-	-	-	-	-	-	<b>#312</b>
	PM		-	239	38	154	282	-	-	-	-	-	-	171
	Saturday		-	197	15	224	280	-	-	-	-	-	-	259
21 Marina Boulevard/ I-880 NB Ramps	Capacity		390	920	-	-	660	660	-	-	-	-	-	800
	AM		<b>m146</b>	0	-	-	<b>m15</b>	<b>m61</b>	-	-	-	-	-	0
	PM		105	0	-	-	32	<b>m49</b>	-	-	-	-	-	0
	Saturday		154	0	-	-	38	129	-	-	-	-	-	0
23 Wells Fargo Driveway/ Merced Street	Capacity		-	-	-	-	217	217	115	650	-	150	443	-
	AM		-	-	-	-	31	18	<b>m0</b>	69	-	37	157	-
	PM		-	-	-	-	67	45	0	20	-	<b>m18</b>	<b>m37</b>	-
	Saturday		-	-	-	-	19	23	0	50	-	74	86	-

Source: Dowling Associates, Inc., 2010.

Notes:

**Capacity** = Turn bay lengths or distance to the closest intersection. Storage lengths are estimates only.

Queue lengths that are at or over-capacity are **bold**.

**m** = volume for 95th percentile queue is metered by upstream traffic signal.

**#** = 95th percentile volume exceeds capacity, queue may be longer (queue length shown is maximum after two signal cycles).

Intersection movements: L=Left Turn, T=Through, R=Right Turn.

**Table 51**

**Queuing Analysis on Marina Boulevard and Merced Street – Baseline plus Kaiser Medical Center Phase 1 with and without Mitigations**

Intersection		Baseline plus Kaiser Medical Center Phase 1									Baseline plus Kaiser Medical Center Phase 1 Mitigated														
		Eastbound			Westbound			Northbound			Southbound			Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
10 Marina Boulevard/ Merced Street	Capacity	75	586	200	360	800	-	150	443	275	110	309	100	75	586	200	360	800	-	150	443	275	110	309	100
	AM	52	155	39	#500	327	-	85	153	244	108	143	20												
	PM	#123	213	34	#570	311	-	#263	210	462	#226	80	m11	106	236	36	#491	242	-	#232	206	180	#265	120	21
	Saturday	75	146	31	#403	325	-	#154	97	143	#117	66	16												
13 Republic Avenue/ Merced Street	Capacity	-	387	-	-	301	250	155	727	727	400	650	-	-	387	-	-	301	250	155	727	727	400	650	-
	AM	-	59	-	-	47	41	m5	336	m8	368	85	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	94	-	-	131	52	m3	263	m7	338	150	-	-	102	-	-	139	53	m3	158	m4	228	206	-
	Saturday	-	35	-	-	51	38	m1	57	1	23	87	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Fairway Drive/ Merced Street	Capacity	240	385	200	230	1126	100	200	956	-	150	727	-	240	385	200	230	1126	100	200	956	-	150	727	-
	AM	166	195	48	141	#344	44	147	245	-	72	235	-												
	PM	#282	273	39	112	#369	79	#156	307	-	103	215	-	#299	285	39	117	#330	46	#188	387	-	#150	330	-
	Saturday	135	149	35	53	165	64	110	222	-	85	243	-												
20 Marina Boulevard/ I-880 SB Ramps	Capacity	-	800	800	420	920	-	-	-	-	-	450	-	800	800	420	920	-	-	-	-	-	-	450	
	AM	-	#407	18	119	302	-	-	-	-	-	#325	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	394	25	165	321	-	-	-	-	-	244	-	m410	m48	121	186	-	-	-	-	-	-	261	
	Saturday	-	321	28	224	309	-	-	-	-	-	289	-												
21 Marina Boulevard/ I-880 NB Ramps	Capacity	390	920	-	-	660	660	-	-	-	-	800	390	920	-	-	660	660	-	-	-	-	-	800	
	AM	m156	m0	-	-	m16	m58	-	-	-	-	0													
	PM	m179	0	-	-	m38	m72	-	-	-	-	0	209	0	-	-	11	m29	-	-	-	-	-	0	
	Saturday	173	0	-	-	43	150	-	-	-	-	0													
23 Wells Fargo Driveway/ Merced Street	Capacity	-	-	-	-	217	217	115	650	-	150	443	-	-	-	-	217	217	115	650	-	150	443	-	
	AM	-	-	-	-	31	18	m0	76	-	43	253	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	67	75	-	32	-	m60	m32	-	-	-	-	72	76	-	29	-	m#82	m22	-	
	Saturday	-	-	-	-	22	25	-	67	-	85	103	-	-	-	-	-	-	-	-	-	-	-	-	

Source: Dowling Associates, Inc., 2010.

Notes:

**Capacity** = Turn bay lengths or distance to the closest intersection. Storage lengths are estimates only.

Queue lengths that are at or over-capacity are **bold**.

**m** = volume for 95th percentile queue is metered by upstream traffic signal.

**#** = 95th percentile volume exceeds capacity, queue may be longer (queue length shown is maximum after two signal cycles).

Intersection movements: L=Left Turn, T=Through, R=Right Turn.

**Table 52**  
**Queuing Analysis on Marina Boulevard and Merced Street – Baseline plus Kaiser Medical Center Phase 1 plus Mixed-Use Retail Development with and without Mitigations**

Intersection		Baseline plus Kaiser Medical Center Phase 1 plus Mixed Use Retail Development									Baseline plus Kaiser Medical Center Phase 1 plus Mixed Use Retail Development Mitigated														
		Eastbound			Westbound			Northbound			Southbound			Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
10 Marina Boulevard/ Merced Street	Capacity	75	586	200	360	800	-	150	443	275	110	309	100	75	586	200	360	800	-	150	443	275	110	309	100
	AM	52	155	43	<b>#554</b>	327	-	89	153	220	108	167	20	52	158	41	<b>#396</b>	322	-	89	153	220	108	167	20
	PM	<b>#123</b>	213	39	<b>m#1047</b>	<b>m284</b>	-	<b>#386</b>	240	<b>384</b>	<b>#226</b>	82	<b>m11</b>	<b>107</b>	248	32	<b>#633</b>	342	-	<b>#353</b>	271	172	<b>#277</b>	128	22
	Saturday	<b>#85</b>	146	38	<b>m#910</b>	<b>m305</b>	-	<b>#309</b>	109	139	<b>#135</b>	128	18	<b>#97</b>	176	35	<b>#567</b>	371	-	<b>#287</b>	132	152	<b>113</b>	156	21
13 Republic Avenue/ Merced Street	Capacity	-	387	-	-	301	250	155	727	727	400	650	-	-	387	-	-	301	250	155	727	727	400	650	-
	AM	-	59	-	-	71	36	<b>m6</b>	<b>#421</b>	<b>m10</b>	<b>#501</b>	103	-	-	59	-	-	71	36	<b>m3</b>	101	<b>m0</b>	200	40	-
	PM	-	<b>#128</b>	-	-	<b>#280</b>	50	<b>m3</b>	<b>#552</b>	<b>m44</b>	<b>#1294</b>	280	-	-	93	-	-	208	44	<b>m3</b>	154	<b>m9</b>	253	115	-
	Saturday	-	32	-	-	<b>#171</b>	42	<b>m2</b>	213	<b>#224</b>	<b>#880</b>	113	-	-	31	-	-	155	40	<b>m1</b>	74	0	48	126	-
15 Fairway Drive/ Merced Street	Capacity	240	385	200	230	1126	100	200	956	-	150	727	-	240	385	200	230	1126	100	200	956	-	150	727	-
	AM	166	198	49	147	<b>#421</b>	54	148	254	-	72	249	-	166	198	49	147	<b>#420</b>	56	148	254	-	69	231	-
	PM	<b>#320</b>	311	43	<b>#129</b>	<b>#496</b>	85	156	<b>#362</b>	-	<b>m104</b>	<b>m294</b>	-	<b>#307</b>	311	43	<b>#96</b>	<b>#468</b>	3	156	<b>#362</b>	-	<b>m111</b>	321	-
	Saturday	159	149	35	83	203	<b>187</b>	113	287	-	<b>m69</b>	272	-	159	149	35	102	193	<b>139</b>	113	287	-	<b>m93</b>	179	-
20 Marina Boulevard/ I-880 SB Ramps	Capacity	-	800	800	420	920	-	-	-	-	-	-	800	-	367	367	420	920	-	-	-	-	-	-	800
	AM	-	<b>#482</b>	14	119	303	-	-	-	-	-	-	<b>#325</b>	-	<b>#484</b>	22	119	303	-	-	-	-	-	-	<b>#397</b>
	PM	-	<b>#700</b>	43	174	462	-	-	-	-	-	-	<b>#455</b>	-	<b>505</b>	175	184	482	-	-	-	-	-	-	<b>#561</b>
	Saturday	-	<b>m#562</b>	<b>m30</b>	223	<b>m578</b>	-	-	-	-	-	-	<b>#534</b>	-	<b>#368</b>	26	<b>#179</b>	<b>m355</b>	-	-	-	-	-	-	<b>#426</b>
21 Marina Boulevard/ I-880 NB Ramps	Capacity	390	920	-	-	660	660	-	-	-	-	-	800	390	920	-	-	660	660	-	-	-	-	-	800
	AM	<b>m163</b>	<b>m0</b>	-	-	<b>m16</b>	<b>m57</b>	-	-	-	-	-	0	<b>m163</b>	<b>m0</b>	-	-	<b>m16</b>	<b>m57</b>	-	-	-	-	-	0
	PM	<b>m#174</b>	<b>m10</b>	-	-	<b>m35</b>	<b>m71</b>	-	-	-	-	-	0	<b>m179</b>	0	-	-	<b>m65</b>	<b>m91</b>	-	-	-	-	-	0
	Saturday	<b>m214</b>	<b>m0</b>	-	-	77	208	-	-	-	-	-	<b>#226</b>	<b>m169</b>	<b>m0</b>	-	-	158	219	-	-	-	-	-	<b>#254</b>
23 Wells Fargo Driveway/ Merced Street	Capacity	-	-	-	-	217	217	115	650	-	150	443	-	-	-	-	-	217	217	115	650	-	150	443	-
	AM	-	-	-	-	31	18	<b>m0</b>	44	-	41	295	-	-	-	-	-	31	18	<b>m0</b>	84	-	41	225	-
	PM	-	-	-	-	67	68	0	<b>m21</b>	-	<b>m20</b>	<b>m50</b>	-	-	-	-	-	67	70	0	86	-	<b>#203</b>	211	-
	Saturday	-	-	-	-	21	25	0	79	-	<b>#115</b>	<b>#305</b>	-	-	-	-	-	22	25	0	79	-	<b>#115</b>	144	-
25 Marina Boulevard/New Signalized Mixed-Use Retail Development Driveway	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	388	-	252	252	-	-	-	337	-	-	-
	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	142	-	88	0	-	-	-	72	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>m259</b>	-	<b>m197</b>	<b>m0</b>	-	-	-	<b>#248</b>	-	-	-
	Saturday	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	<b>m132</b>	<b>m0</b>	-	-	-	247	-	-	-

Source: Dowling Associates, Inc., 2010.

Notes:

**Capacity** = Turn bay lengths or distance to the closest intersection. Storage lengths are estimates only.

Queue lengths that are at or over-capacity are **bold**.

**m** = volume for 95th percentile queue is metered by upstream traffic signal.

**#** = 95th percentile volume exceeds capacity, queue may be longer (queue length shown is maximum after two signal cycles).

Intersection movements: L=Left Turn, T=Through, R=Right Turn.

**Table 53**  
**Queuing Analysis on Marina Boulevard and Merced Street – Cumulative No Project**

Intersection	Time	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
10 Marina Boulevard/ Merced Street	Capacity	75	586	200	360	800	-	150	443	275	110	309	100
	AM	56	175	23	<b>m#394</b>	<b>m414</b>	-	103	197	118	<b>117</b>	98	26
	PM	<b>111</b>	<b>250</b>	35	<b>371</b>	322	-	117	264	175	<b>228</b>	115	19
	Saturday	<b>83</b>	208	36	<b>397</b>	512	-	110	158	94	<b>125</b>	83	20
13 Republic Avenue/ Merced Street	Capacity	-	-	-	-	-	-	-	-	-	-	-	-
	AM	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-
	Saturday	-	-	-	-	-	-	-	-	-	-	-	-
15 Fairway Drive/ Merced Street	Capacity	240	385	200	230	1126	100	200	956	-	150	727	-
	AM	<b>#218</b>	199	68	<b>#244</b>	<b>#411</b>	82	<b>#284</b>	228	-	70	237	-
	PM	<b>#365</b>	384	45	<b>#121</b>	<b>#297</b>	62	<b>#309</b>	<b>#471</b>	-	<b>#157</b>	<b>#369</b>	-
	Saturday	160	184	46	106	209	40	169	241	-	75	306	-
20 Marina Boulevard/ I-880 SB Ramps	Capacity	-	800	800	420	920	-	-	-	-	-	-	450
	AM	-	<b>#470</b>	21	189	349	-	-	-	-	-	-	<b>#510</b>
	PM	-	324	81	209	103	-	-	-	-	-	-	235
	Saturday	-	415	49	381	424	-	-	-	-	-	-	<b>#513</b>
21 Marina Boulevard/ I-880 NB Ramps	Capacity	390	920	-	-	660	660	-	-	-	-	-	800
	AM	<b>m222</b>	<b>m0</b>	-	-	<b>m175</b>	<b>m87</b>	-	-	-	-	-	0
	PM	179	6	-	-	<b>m2</b>	<b>m58</b>	-	-	-	-	-	0
	Saturday	221	0	-	-	233	483	-	-	-	-	-	0
23 Wells Fargo Driveway/ Merced Street	Capacity	-	-	-	-	217	217	115	650	-	150	443	-
	AM	-	-	-	-	31	18	<b>m0</b>	63	-	43	222	-
	PM	-	-	-	-	67	45	0	18	-	108	141	-
	Saturday	-	-	-	-	21	25	0	62	-	80	106	-

Source: Dowling Associates, Inc., 2010.

Notes:

**Capacity** = Turn bay lengths or distance to the closest intersection. Storage lengths are estimates only.

Queue lengths that are at or over-capacity are **bold**.

**m** = volume for 95th percentile queue is metered by upstream traffic signal.

**#** = 95th percentile volume exceeds capacity, queue may be longer (queue length shown is maximum after two signal cycles).

Intersection movements: L=Left Turn, T=Through, R=Right Turn.

**Table 54**  
**Queuing Analysis on Marina Boulevard and Merced Street – Cumulative plus Kaiser Medical Center Phase 1 plus Mixed-Use Retail Development with and without Mitigations**

Intersection		Cumulative plus Kaiser Medical Center Phase 1 plus Mixed Use Retail Development											Cumulative plus Kaiser Medical Center Phase 1 plus Mixed Use Retail Development Mitigated												
		Eastbound			Westbound			Northbound			Southbound			Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
10 Marina Boulevard/ Merced Street	Capacity	75	586	200	360	800	-	150	443	275	110	309	100	75	586	200	360	800	-	150	443	275	110	309	100
	AM	56	181	33	<b>m#727</b>	<b>m419</b>	-	<b>#167</b>	205	142	<b>#152</b>	223	33	70	249	35	<b>#686</b>	594	0	<b>#204</b>	298	249	<b>#185</b>	305	50
	PM	<b>111</b>	250	44	<b>m#931</b>	<b>m258</b>	-	<b>#633</b>	<b>#363</b>	224	<b>228</b>	115	19	<b>120</b>	<b>#307</b>	37	<b>#710</b>	370	0	<b>#518</b>	341	176	<b>#308</b>	150	24
	Saturday	<b>85</b>	217	55	<b>#1321</b>	547	-	<b>#384</b>	183	115	<b>129</b>	135	19	<b>85</b>	230	48	<b>#795</b>	547	0	<b>#384</b>	183	115	<b>129</b>	135	19
13 Republic Avenue/ Merced Street	Capacity	-	387	-	-	301	250	155	727	727	400	650	-	-	387	-	-	301	250	155	727	727	400	650	-
	AM	-	58	-	-	88	34	<b>m19</b>	<b>#586</b>	<b>m12</b>	<b>#809</b>	143	-	-	71	-	-	108	38	m24	251	m4	271	2	-
	PM	-	<b>#144</b>	-	-	<b>#321</b>	51	<b>m3</b>	<b>m#518</b>	<b>m8</b>	<b>#1337</b>	140	-	-	123	-	-	<b>#304</b>	52	m3	623	m41	296	393	-
	Saturday	-	33	-	-	<b>#308</b>	40	<b>m5</b>	<b>#473</b>	144	<b>#1301</b>	147	-	-	28	-	-	213	34	m7	330	107	248	207	-
15 Fairway Drive/ Merced Street	Capacity	240	385	200	230	1126	100	200	956	-	150	727	-	240	385	200	230	1126	100	200	956	-	150	727	-
	AM	<b>#218</b>	214	89	<b>#223</b>	<b>#548</b>	62	<b>#307</b>	284	-	<b>m69</b>	<b>#572</b>	-	<b>#120</b>	<b>#292</b>	85	<b>#267</b>	321	0	<b>#314</b>	460	0	79	512	-
	PM	<b>#443</b>	<b>#446</b>	59	<b>#169</b>	<b>#744</b>	18	<b>#353</b>	<b>#647</b>	-	<b>m#129</b>	<b>m#458</b>	-	<b>#240</b>	<b>#630</b>	110	<b>#216</b>	366	0	<b>#390</b>	645	0	<b>m#173</b>	318	-
	Saturday	<b>#192</b>	195	47	154	224	<b>109</b>	<b>#173</b>	320	-	<b>m95</b>	<b>m336</b>	-	87	197	48	154	153	0	171	320	0	<b>m82</b>	381	-
20 Marina Boulevard/ I-880 SB Ramps	Capacity	-	800	800	420	920	-	-	-	-	-	-	800	-	367	367	420	920	-	-	-	-	-	-	800
	AM	-	<b>#596</b>	61	<b>m#466</b>	<b>#471</b>	-	-	-	-	-	-	<b>#619</b>	-	373	264	m489	<b>#1165</b>	-	-	-	-	-	-	403
	PM	-	<b>#880</b>	160	<b>#346</b>	157	-	-	-	-	-	-	<b>#706</b>	-	439	59	<b>#372</b>	440	-	-	-	-	-	-	383
	Saturday	-	<b>#834</b>	273	<b>m349</b>	m686	-	-	-	-	-	-	<b>#1077</b>	-	411	363	m312	m#973	-	-	-	-	-	-	<b>#664</b>
21 Marina Boulevard/ I-880 NB Ramps	Capacity	390	920	-	-	660	660	-	-	-	-	-	800	390	920	-	-	660	660	-	-	-	-	-	-
	AM	<b>m227</b>	<b>m0</b>	-	-	<b>m293</b>	<b>m93</b>	-	-	-	-	-	<b>#25</b>	234	0	-	-	276	<b>m166</b>	-	-	-	-	-	<b>#86</b>
	PM	<b>m290</b>	<b>m0</b>	-	-	<b>m5</b>	<b>m37</b>	-	-	-	-	-	0	196	0	-	-	165	<b>m139</b>	-	-	-	-	-	0
	Saturday	<b>m274</b>	<b>m0</b>	-	-	285	530	-	-	-	-	-	<b>#678</b>	373	0	-	-	359	645	-	-	-	-	-	<b>#678</b>
23 Wells Fargo Driveway/ Merced Street	Capacity	-	-	-	-	217	217	115	650	-	150	443	-	-	-	-	-	217	217	115	650	-	150	443	-
	AM	-	-	-	-	31	18	<b>m0</b>	<b>m112</b>	-	47	<b>636</b>	-	-	-	-	-	39	21	m0	85	-	m2	17	-
	PM	-	-	-	-	67	87	0	<b>m53</b>	-	<b>#157</b>	398	-	-	-	-	-	84	99	0	28	-	m#124	m13	-
	Saturday	-	-	-	-	21	25	0	90	-	<b>#125</b>	<b>#501</b>	-	-	-	-	-	22	25	0	90	-	<b>#125</b>	229	-
25 Marina Boulevard/New Signalized Mixed-Use Retail Development Driveway	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	388	-	252	252	-	-	-	337	-	-	-
	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	165	-	m78	m0	-	-	-	93	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	m268	-	m227	0	-	-	-	285	-	-	-
	Saturday	-	-	-	-	-	-	-	-	-	-	-	-	-	188	-	224	0	-	-	-	253	-	-	-

Source: Dowling Associates, Inc., 2010.

Notes:

**Capacity** = Turn bay lengths or distance to the closest intersection. Storage lengths are estimates only.

Queue lengths that are at or over-capacity are **bold**.

**m** = volume for 95th percentile queue is metered by upstream traffic signal.

**#** = 95th percentile volume exceeds capacity, queue may be longer (queue length shown is maximum after two signal cycles).

Intersection movements: L=Left Turn, T=Through, R=Right Turn.

**Table 55**  
**Queuing Analysis on Marina Boulevard and Merced Street – Cumulative Kaiser Medical Center Build-Out plus Mixed-Use Retail Development with and without Mitigations**

Intersection		Cumulative plus Kaiser Medical Center Build-Out plus Mixed Use Retail Development												Cumulative plus Kaiser Medical Center Build-Out plus Mixed Use Retail Development Mitigated											
		Eastbound			Westbound			Northbound			Southbound			Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
10 Marina Boulevard/ Merced Street	Capacity	75	586	200	360	800	-	150	443	275	110	309	100	75	586	200	360	800	-	150	443	275	110	309	100
	AM	56	181	44	<b>m#842</b>	<b>m406</b>	-	<b>#298</b>	205	144	<b>#152</b>	224	33	70	249	50	<b>#897</b>	515	0	<b>#350</b>	183	27	<b>#207</b>	<b>#347</b>	52
	PM	<b>111</b>	250	53	<b>m#965</b>	<b>m260</b>	-	<b>#757</b>	<b>#403</b>	268	<b>228</b>	115	19	<b>120</b>	<b>#319</b>	49	<b>#789</b>	387	0	<b>#620</b>	<b>#388</b>	41	<b>#274</b>	150	24
	Sat	<b>85</b>	217	56	<b>#1413</b>	548	-	<b>#410</b>	187	126	<b>129</b>	135	19	<b>85</b>	<b>230</b>	49	<b>#890</b>	548	0	<b>#410</b>	187	126	<b>129</b>	135	19
13 Republic Avenue/ Merced Street	Capacity	-	387	-	-	301	250	155	727	727	400	650	-	-	387	-	-	301	250	155	727	727	400	650	-
	AM	-	57	-	-	87	40	<b>m0</b>	<b>#601</b>	<b>m12</b>	<b>#1287</b>	169	-	-	72	-	-	107	45	<b>m29</b>	590	<b>m56</b>	395	502	-
	PM	-	<b>#145</b>	-	-	<b>#322</b>	58	<b>m3</b>	<b>m#517</b>	<b>m8</b>	<b>#1427</b>	198	-	-	123	-	-	<b>#305</b>	176	<b>m4</b>	702	<b>m37</b>	315	107	-
	Sat	-	33	-	-	<b>#308</b>	43	<b>m0</b>	<b>#457</b>	110	<b>#1443</b>	147	-	-	29	-	-	217	37	<b>m9</b>	184	20	286	201	-
15 Fairway Drive/ Merced Street	Capacity	240	385	200	230	1126	100	200	956	-	150	727	-	240	385	200	230	1126	100	200	956	-	150	727	-
	AM	<b>#218</b>	222	172	<b>#234</b>	<b>#557</b>	86	<b>#336</b>	292	-	<b>m69</b>	<b>#573</b>	-	<b>#120</b>	<b>#288</b>	157	<b>#271</b>	317	0	<b>#337</b>	270	0	83	135	-
	PM	<b>#443</b>	<b>#446</b>	70	<b>#262</b>	<b>#808</b>	53	<b>#396</b>	<b>#646</b>	-	<b>m#119</b>	<b>m#458</b>	-	<b>#240</b>	<b>#642</b>	143	<b>#279</b>	380	0	<b>#428</b>	395	0	<b>m131</b>	<b>#300</b>	-
	Sat	<b>#192</b>	198	47	167	283	<b>116</b>	<b>#173</b>	329	-	<b>m96</b>	<b>m367</b>	-	87	200	47	167	193	0	171	196	0	<b>m100</b>	377	-
20 Marina Boulevard/ I-880 SB Ramps	Capacity	-	800	800	420	920	-	-	-	-	-	-	800	-	367	367	420	920	-	-	-	-	-	-	800
	AM	-	<b>#596</b>	62	<b>m#522</b>	<b>m#880</b>	-	-	-	-	-	-	<b>#627</b>	-	316	238	<b>m#601</b>	<b>m#1227</b>	-	-	-	-	-	-	<b>#436</b>
	PM	-	<b>#1058</b>	211	<b>#450</b>	188	-	-	-	-	-	-	<b>#722</b>	-	<b>517</b>	60	<b>#462</b>	<b>#916</b>	-	-	-	-	-	-	396
	Sat	-	<b>#861</b>	286	<b>m335</b>	<b>m742</b>	-	-	-	-	-	-	<b>#1083</b>	-	<b>444</b>	<b>378</b>	<b>m376</b>	<b>m#999</b>	-	-	-	-	-	-	<b>#682</b>
21 Marina Boulevard/ I-880 NB Ramps	Capacity	390	920	-	-	660	660	-	-	-	-	-	800	390	920	-	-	660	660	-	-	-	-	-	800
	AM	<b>m227</b>	<b>m0</b>	-	-	<b>m322</b>	<b>m95</b>	-	-	-	-	-	<b>#175</b>	227	0	-	-	293	<b>m135</b>	-	-	-	-	-	<b>#183</b>
	PM	<b>m#340</b>	<b>m0</b>	-	-	<b>m8</b>	<b>m65</b>	-	-	-	-	-	0	222	0	-	-	553	<b>m609</b>	-	-	-	-	-	0
	Sat	<b>m287</b>	<b>m0</b>	-	-	301	532	-	-	-	-	-	<b>#771</b>	191	0	-	-	229	<b>#491</b>	-	-	-	-	-	<b>#495</b>
23 Wells Fargo Driveway/ Merced Street	Capacity	-	-	-	-	217	217	115	650	-	150	443	-	-	-	-	-	217	217	115	650	-	150	443	-
	AM	-	-	-	-	31	18	<b>m0</b>	<b>m87</b>	-	48	773	-	-	-	-	-	39	21	<b>m0</b>	187	-	<b>m2</b>	<b>m26</b>	-
	PM	-	-	-	-	67	96	0	<b>m43</b>	-	<b>#204</b>	<b>445</b>	-	-	-	-	-	83	112	0	383	-	<b>m#189</b>	<b>m48</b>	-
	Sat	-	-	-	-	21	29	0	96	-	<b>#131</b>	<b>#541</b>	-	-	-	-	-	22	29	0	96	-	<b>#131</b>	258	-
25 Marina Boulevard/New Signalized Mixed-Use Retail Development Driveway	Capacity	-	-	-	-	-	-	-	-	-	-	-	-	-	388	-	252	252	-	-	-	337	-	-	-
	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	122	-	<b>m85</b>	<b>m0</b>	-	-	-	100	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	329	-	<b>m223</b>	<b>m0</b>	-	-	-	<b>#308</b>	-	-	-
	Sat	-	-	-	-	-	-	-	-	-	-	-	-	-	191	-	232	0	-	-	-	257	-	-	-

Source: Dowling Associates, Inc., 2010.

Notes:

**Capacity** = Turn bay lengths or distance to the closest intersection. Storage lengths are estimates only.

Queue lengths that are at or over-capacity are **bold**.

**m** = volume for 95th percentile queue is metered by upstream traffic signal.

**#** = 95th percentile volume exceeds capacity, queue may be longer (queue length shown is maximum after two signal cycles).

Intersection movements: L=Left Turn, T=Through, R=Right Turn.