APPENDIX E

NOISE DATA

Measurement 1

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 79.2 - 2017/06/14 08:09:07
- Level Range : 40-100
- SEL : 90.4
- Leq : 60.8
-

No.s	Date Time	(dB)
1	2017/06/14 08:06:15	57.4
2	2017/06/14 08:06:18	59.3
3	2017/06/14 08:06:21	56.9
4	2017/06/14 08:06:24	59.4
5	2017/06/14 08:06:27	63.4
6	2017/06/14 08:06:30	66.6
7	2017/06/14 08:06:33	59.0
8	2017/06/14 08:06:36	61.8
9	2017/06/14 08:06:39	58.8
10	2017/06/14 08:06:42	60.0
11	2017/06/14 08:06:45	57.5
12	2017/06/14 08:06:48	56.8
13	2017/06/14 08:06:51	54.6
14	2017/06/14 08:06:54	51.8
15	2017/06/14 08:06:57	54.5
16	2017/06/14 08:07:00	58.6
17	2017/06/14 08:07:03	53.1
18	2017/06/14 08:07:06	55.0
19	2017/06/14 08:07:09	51.6
20	2017/06/14 08:07:12	53.3
21	2017/06/14 08:07:15	52.2
22	2017/06/14 08:07:18	58.1
23	2017/06/14 08:07:21	61.5
24	2017/06/14 08:07:24	67.6
25	2017/06/14 08:07:27	65.3
26	2017/06/14 08:07:30	67.3
27	2017/06/14 08:07:33	66.1
28	2017/06/14 08:07:36	59.2
29	2017/06/14 08:07:39	63.2
30	2017/06/14 08:07:42	56.4
31	2017/06/14 08:07:45	54.8
32	2017/06/14 08:07:48	53.3
33	2017/06/14 08:07:51	56.0
34	2017/06/14 08:07:54	69.0
35	2017/06/14 08:07:57	52.1
36	2017/06/14 08:08:00	51.0
37	2017/06/14 08:08:03	50.3
38	2017/06/14 08:08:06	51.9
39	2017/06/14 08:08:09	52.3
40	2017/06/14 08:08:12	51.9
41	2017/06/14 08:08:15	54.4
42	2017/06/14 08:08:18	59.8
43	2017/06/14 08:08:21	65.8
44	2017/06/14 08:08:24	54.0
45	2017/06/14 08:08:27	55.8
46	2017/06/14 08:08:30	58.7
47	2017/06/14 08:08:33	60.5
48	2017/06/14 08:08:36	61.5
49	2017/06/14 08:08:39	62.9
50	2017/06/14 08:08:42	60.5
51	2017/06/14 08:08:45	60.0
52	2017/06/14 08:08:48	56.7
53	2017/06/14 08:08:51	55.3
54	2017/06/14 08:08:54	55.4
55	2017/06/14 08:08:57	53.8
56	2017/06/14 08:09:00	56.8
57	2017/06/14 08:09:03	65.1
58	2017/06/14 08:09:06	75.8
59	2017/06/14 08:09:09	62.9
60	2017/06/14 08:09:12	56.7
61	2017/06/14 08:09:15	55.2
62	2017/06/14 08:09:18	58.1
63	2017/06/14 08:09:21	55.8
64	2017/06/14 08:09:24	60.0
65	2017/06/14 08:09:27	55.4
66	2017/06/14 08:09:30	58.7
67	2017/06/14 08:09:33	61.7
68	2017/06/14 08:09:36	67.6
69	2017/06/14 08:09:39	56.9
70	2017/06/14 08:09:42	62.2
71	2017/06/14 08:09:45	57.8
72	2017/06/14 08:09:48	53.1
73	2017/06/14 08:09:51	53.7
74	2017/06/14 08:09:54	53.3
75	2017/06/14 08:09:57	56.1
76	2017/06/14 08:10:00	69.9
77	2017/06/14 08:10:03	65.3
78	2017/06/14 08:10:06	53.3
79	2017/06/14 08:10:09	51.4
80	2017/06/14 08:10:12	53.3
81	2017/06/14 08:10:15	65.7
82	2017/06/14 08:10:18	64.8
83	2017/06/14 08:10:21	64.4
84	2017/06/14 08:10:24	59.9
85	2017/06/14 08:10:27	62.5

86	2017/06/14	08:10:30	59.4
87	2017/06/14	08:10:33	57.6
88	2017/06/14	08:10:36	58.9
89	2017/06/14	08:10:39	62.2
90	2017/06/14	08:10:42	61.0
91	2017/06/14	08:10:45	60.2
92	2017/06/14	08:10:48	58.5
93	2017/06/14	08:10:51	52.1
94	2017/06/14	08:10:54	49.7
95	2017/06/14	08:10:57	51.8
96	2017/06/14	08:11:00	54.7
97	2017/06/14	08:11:03	63.3
98	2017/06/14	08:11:06	53.0
99	2017/06/14	08:11:09	53.9
100	2017/06/14	08:11:12	63.2
101	2017/06/14	08:11:15	55.5
102	2017/06/14	08:11:18	55.5
103	2017/06/14	08:11:21	61.4
104	2017/06/14	08:11:24	61.6
105	2017/06/14	08:11:27	61.3
106	2017/06/14	08:11:30	61.4
107	2017/06/14	08:11:33	59.0
108	2017/06/14	08:11:36	59.9
109	2017/06/14	08:11:39	65.4
110	2017/06/14	08:11:42	59.4
111	2017/06/14	08:11:45	60.6
112	2017/06/14	08:11:48	59.1
113	2017/06/14	08:11:51	59.4
114	2017/06/14	08:11:54	56.8
115	2017/06/14	08:11:57	56.5
116	2017/06/14	08:12:00	52.7
117	2017/06/14	08:12:03	57.7
118	2017/06/14	08:12:06	56.5
119	2017/06/14	08:12:09	52.7
120	2017/06/14	08:12:12	52.5
121	2017/06/14	08:12:15	54.9
122	2017/06/14	08:12:18	55.7
123	2017/06/14	08:12:21	50.9
124	2017/06/14	08:12:24	55.0
125	2017/06/14	08:12:27	56.6
126	2017/06/14	08:12:30	57.2
127	2017/06/14	08:12:33	59.6
128	2017/06/14	08:12:36	56.4
129	2017/06/14	08:12:39	62.2
130	2017/06/14	08:12:42	62.1
131	2017/06/14	08:12:45	57.0
132	2017/06/14	08:12:48	53.3
133	2017/06/14	08:12:51	59.4
134	2017/06/14	08:12:54	69.5
135	2017/06/14	08:12:57	58.1
136	2017/06/14	08:13:00	55.2
137	2017/06/14	08:13:03	55.0
138	2017/06/14	08:13:06	56.6
139	2017/06/14	08:13:09	54.4
140	2017/06/14	08:13:12	52.1
141	2017/06/14	08:13:15	57.5
142	2017/06/14	08:13:18	58.6
143	2017/06/14	08:13:21	62.1
144	2017/06/14	08:13:24	58.6
145	2017/06/14	08:13:27	64.7
146	2017/06/14	08:13:30	63.5
147	2017/06/14	08:13:33	62.6
148	2017/06/14	08:13:36	64.1
149	2017/06/14	08:13:39	57.1
150	2017/06/14	08:13:42	56.9
151	2017/06/14	08:13:45	54.4
152	2017/06/14	08:13:48	55.8
153	2017/06/14	08:13:51	52.7
154	2017/06/14	08:13:54	49.0
155	2017/06/14	08:13:57	51.8
156	2017/06/14	08:14:00	62.8
157	2017/06/14	08:14:03	59.5
158	2017/06/14	08:14:06	62.0
159	2017/06/14	08:14:09	61.8
160	2017/06/14	08:14:12	61.0
161	2017/06/14	08:14:15	60.3
162	2017/06/14	08:14:18	60.4
163	2017/06/14	08:14:21	57.4
164	2017/06/14	08:14:24	60.7
165	2017/06/14	08:14:27	63.2
166	2017/06/14	08:14:30	55.2
167	2017/06/14	08:14:33	58.7
168	2017/06/14	08:14:36	54.3
169	2017/06/14	08:14:39	59.9
170	2017/06/14	08:14:42	55.2
171	2017/06/14	08:14:45	58.4
172	2017/06/14	08:14:48	57.5
173	2017/06/14	08:14:51	58.8
174	2017/06/14	08:14:54	56.9
175	2017/06/14	08:14:57	49.7
176	2017/06/14	08:15:00	48.3
177	2017/06/14	08:15:03	50.2
178	2017/06/14	08:15:06	51.3
179	2017/06/14	08:15:09	53.9
180	2017/06/14	08:15:12	58.9
181	2017/06/14	08:15:15	59.7
182	2017/06/14	08:15:18	54.3
183	2017/06/14	08:15:21	60.9
184	2017/06/14	08:15:24	56.3

185	2017/06/14	08:15:27	57.0
186	2017/06/14	08:15:30	54.2
187	2017/06/14	08:15:33	59.9
188	2017/06/14	08:15:36	62.6
189	2017/06/14	08:15:39	63.6
190	2017/06/14	08:15:42	60.8
191	2017/06/14	08:15:45	62.8
192	2017/06/14	08:15:48	58.9
193	2017/06/14	08:15:51	59.5
194	2017/06/14	08:15:54	56.7
195	2017/06/14	08:15:57	58.5
196	2017/06/14	08:16:00	57.1
197	2017/06/14	08:16:03	61.9
198	2017/06/14	08:16:06	49.8
199	2017/06/14	08:16:09	49.0
200	2017/06/14	08:16:12	47.3
201	2017/06/14	08:16:15	46.4
202	2017/06/14	08:16:18	46.5
203	2017/06/14	08:16:21	51.6
204	2017/06/14	08:16:24	51.1
205	2017/06/14	08:16:27	48.6
206	2017/06/14	08:16:30	52.1
207	2017/06/14	08:16:33	66.6
208	2017/06/14	08:16:36	61.2
209	2017/06/14	08:16:39	55.0
210	2017/06/14	08:16:42	59.9
211	2017/06/14	08:16:45	56.4
212	2017/06/14	08:16:48	55.8
213	2017/06/14	08:16:51	55.4
214	2017/06/14	08:16:54	57.9
215	2017/06/14	08:16:57	58.7
216	2017/06/14	08:17:00	56.9
217	2017/06/14	08:17:03	57.1
218	2017/06/14	08:17:06	56.2
219	2017/06/14	08:17:09	62.9
220	2017/06/14	08:17:12	52.5
221	2017/06/14	08:17:15	54.2
222	2017/06/14	08:17:18	60.3
223	2017/06/14	08:17:21	55.9
224	2017/06/14	08:17:24	56.7
225	2017/06/14	08:17:27	55.2
226	2017/06/14	08:17:30	61.2
227	2017/06/14	08:17:33	55.2
228	2017/06/14	08:17:36	57.2
229	2017/06/14	08:17:39	56.7
230	2017/06/14	08:17:42	61.2
231	2017/06/14	08:17:45	59.6
232	2017/06/14	08:17:48	59.9
233	2017/06/14	08:17:51	71.4
234	2017/06/14	08:17:54	67.5
235	2017/06/14	08:17:57	64.9
236	2017/06/14	08:18:00	59.1
237	2017/06/14	08:18:03	67.2
238	2017/06/14	08:18:06	59.0
239	2017/06/14	08:18:09	60.7
240	2017/06/14	08:18:12	58.6
241	2017/06/14	08:18:15	62.3
242	2017/06/14	08:18:18	58.1
243	2017/06/14	08:18:21	59.8
244	2017/06/14	08:18:24	57.4
245	2017/06/14	08:18:27	53.0
246	2017/06/14	08:18:30	57.3
247	2017/06/14	08:18:33	54.4
248	2017/06/14	08:18:36	57.7
249	2017/06/14	08:18:39	50.4
250	2017/06/14	08:18:42	48.9
251	2017/06/14	08:18:45	48.1
252	2017/06/14	08:18:48	46.9
253	2017/06/14	08:18:51	51.7
254	2017/06/14	08:18:54	49.7
255	2017/06/14	08:18:57	49.6
256	2017/06/14	08:19:00	56.2
257	2017/06/14	08:19:03	57.4
258	2017/06/14	08:19:06	59.4
259	2017/06/14	08:19:09	64.3
260	2017/06/14	08:19:12	55.8
261	2017/06/14	08:19:15	60.9
262	2017/06/14	08:19:18	60.6
263	2017/06/14	08:19:21	65.8
264	2017/06/14	08:19:24	61.1
265	2017/06/14	08:19:27	59.9
266	2017/06/14	08:19:30	57.1
267	2017/06/14	08:19:33	57.4
268	2017/06/14	08:19:36	60.4
269	2017/06/14	08:19:39	56.4
270	2017/06/14	08:19:42	65.5
271	2017/06/14	08:19:45	58.3
272	2017/06/14	08:19:48	67.2
273	2017/06/14	08:19:51	58.0
274	2017/06/14	08:19:54	50.2
275	2017/06/14	08:19:57	61.8
276	2017/06/14	08:20:00	51.5
277	2017/06/14	08:20:03	50.4
278	2017/06/14	08:20:06	48.3
279	2017/06/14	08:20:09	47.4
280	2017/06/14	08:20:12	46.1
281	2017/06/14	08:20:15	50.5
282	2017/06/14	08:20:18	49.0
283	2017/06/14	08:20:21	47.7

284	2017/06/14	08:20:24	49.8
285	2017/06/14	08:20:27	50.1
286	2017/06/14	08:20:30	59.5
287	2017/06/14	08:20:33	61.0
288	2017/06/14	08:20:36	62.8
289	2017/06/14	08:20:39	59.0
290	2017/06/14	08:20:42	61.6
291	2017/06/14	08:20:45	62.0
292	2017/06/14	08:20:48	56.6
293	2017/06/14	08:20:51	56.4
294	2017/06/14	08:20:54	58.5
295	2017/06/14	08:20:57	59.5
296	2017/06/14	08:21:00	57.5
297	2017/06/14	08:21:03	62.7
298	2017/06/14	08:21:06	57.1
299	2017/06/14	08:21:09	51.4
300	2017/06/14	08:21:12	49.1

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 86.5 - 2017/06/14 08:38:12
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0
-

Measurement 2

No.s	Date Time	(dB)
1	2017/06/14 08:30:03	70.0
2	2017/06/14 08:30:06	71.2
3	2017/06/14 08:30:09	62.9
4	2017/06/14 08:30:12	60.0
5	2017/06/14 08:30:15	67.2
6	2017/06/14 08:30:18	69.8
7	2017/06/14 08:30:21	75.0
8	2017/06/14 08:30:24	72.0
9	2017/06/14 08:30:27	64.4
10	2017/06/14 08:30:30	61.6
11	2017/06/14 08:30:33	74.9
12	2017/06/14 08:30:36	68.9
13	2017/06/14 08:30:39	69.6
14	2017/06/14 08:30:42	69.7
15	2017/06/14 08:30:45	72.5
16	2017/06/14 08:30:48	65.9
17	2017/06/14 08:30:51	60.9
18	2017/06/14 08:30:54	67.2
19	2017/06/14 08:30:57	70.5
20	2017/06/14 08:31:00	66.5
21	2017/06/14 08:31:03	62.5
22	2017/06/14 08:31:06	72.5
23	2017/06/14 08:31:09	65.6
24	2017/06/14 08:31:12	70.3
25	2017/06/14 08:31:15	69.8
26	2017/06/14 08:31:18	69.6
27	2017/06/14 08:31:21	61.1
28	2017/06/14 08:31:24	69.9
29	2017/06/14 08:31:27	63.8
30	2017/06/14 08:31:30	61.9
31	2017/06/14 08:31:33	60.7
32	2017/06/14 08:31:36	60.2
33	2017/06/14 08:31:39	67.0
34	2017/06/14 08:31:42	69.8
35	2017/06/14 08:31:45	67.4
36	2017/06/14 08:31:48	68.6
37	2017/06/14 08:31:51	69.5
38	2017/06/14 08:31:54	67.6
39	2017/06/14 08:31:57	64.8
40	2017/06/14 08:32:00	66.7
41	2017/06/14 08:32:03	65.8
42	2017/06/14 08:32:06	68.1
43	2017/06/14 08:32:09	61.1
44	2017/06/14 08:32:12	65.2
45	2017/06/14 08:32:15	78.6
46	2017/06/14 08:32:18	67.7
47	2017/06/14 08:32:21	74.0
48	2017/06/14 08:32:24	70.8
49	2017/06/14 08:32:27	76.8
50	2017/06/14 08:32:30	73.2
51	2017/06/14 08:32:33	65.4
52	2017/06/14 08:32:36	64.5
53	2017/06/14 08:32:39	69.0
54	2017/06/14 08:32:42	63.3
55	2017/06/14 08:32:45	59.9
56	2017/06/14 08:32:48	62.7
57	2017/06/14 08:32:51	61.4
58	2017/06/14 08:32:54	58.1
59	2017/06/14 08:32:57	63.2
60	2017/06/14 08:33:00	68.8
61	2017/06/14 08:33:03	60.1
62	2017/06/14 08:33:06	58.2
63	2017/06/14 08:33:09	67.0
64	2017/06/14 08:33:12	71.4
65	2017/06/14 08:33:15	69.7
66	2017/06/14 08:33:18	69.9
67	2017/06/14 08:33:21	68.2
68	2017/06/14 08:33:24	67.9
69	2017/06/14 08:33:27	72.2
70	2017/06/14 08:33:30	67.7
71	2017/06/14 08:33:33	68.2
72	2017/06/14 08:33:36	76.7
73	2017/06/14 08:33:39	75.3
74	2017/06/14 08:33:42	73.2
75	2017/06/14 08:33:45	72.8
76	2017/06/14 08:33:48	67.4
77	2017/06/14 08:33:51	78.1
78	2017/06/14 08:33:54	74.3
79	2017/06/14 08:33:57	70.9
80	2017/06/14 08:34:00	69.1
81	2017/06/14 08:34:03	66.3
82	2017/06/14 08:34:06	66.6
83	2017/06/14 08:34:09	62.8
84	2017/06/14 08:34:12	70.5
85	2017/06/14 08:34:15	61.6

86	2017/06/14	08:34:18	61.7
87	2017/06/14	08:34:21	61.0
88	2017/06/14	08:34:24	63.9
89	2017/06/14	08:34:27	69.1
90	2017/06/14	08:34:30	65.2
91	2017/06/14	08:34:33	59.8
92	2017/06/14	08:34:36	59.2
93	2017/06/14	08:34:39	55.9
94	2017/06/14	08:34:42	59.3
95	2017/06/14	08:34:45	63.6
96	2017/06/14	08:34:48	62.6
97	2017/06/14	08:34:51	71.8
98	2017/06/14	08:34:54	72.3
99	2017/06/14	08:34:57	73.3
100	2017/06/14	08:35:00	70.5
101	2017/06/14	08:35:03	77.7
102	2017/06/14	08:35:06	71.1
103	2017/06/14	08:35:09	63.5
104	2017/06/14	08:35:12	66.3
105	2017/06/14	08:35:15	67.0
106	2017/06/14	08:35:18	76.0
107	2017/06/14	08:35:21	80.6
108	2017/06/14	08:35:24	71.3
109	2017/06/14	08:35:27	77.0
110	2017/06/14	08:35:30	69.3
111	2017/06/14	08:35:33	78.3
112	2017/06/14	08:35:36	71.4
113	2017/06/14	08:35:39	73.5
114	2017/06/14	08:35:42	68.6
115	2017/06/14	08:35:45	67.5
116	2017/06/14	08:35:48	74.7
117	2017/06/14	08:35:51	64.8
118	2017/06/14	08:35:54	61.6
119	2017/06/14	08:35:57	61.2
120	2017/06/14	08:36:00	56.1
121	2017/06/14	08:36:03	57.5
122	2017/06/14	08:36:06	59.0
123	2017/06/14	08:36:09	57.2
124	2017/06/14	08:36:12	61.8
125	2017/06/14	08:36:15	72.5
126	2017/06/14	08:36:18	73.9
127	2017/06/14	08:36:21	69.9
128	2017/06/14	08:36:24	69.1
129	2017/06/14	08:36:27	63.9
130	2017/06/14	08:36:30	73.6
131	2017/06/14	08:36:33	69.0
132	2017/06/14	08:36:36	68.4
133	2017/06/14	08:36:39	67.5
134	2017/06/14	08:36:42	68.7
135	2017/06/14	08:36:45	69.6
136	2017/06/14	08:36:48	68.6
137	2017/06/14	08:36:51	76.4
138	2017/06/14	08:36:54	67.9
139	2017/06/14	08:36:57	71.4
140	2017/06/14	08:37:00	67.8
141	2017/06/14	08:37:03	67.7
142	2017/06/14	08:37:06	76.1
143	2017/06/14	08:37:09	75.6
144	2017/06/14	08:37:12	74.9
145	2017/06/14	08:37:15	72.8
146	2017/06/14	08:37:18	72.6
147	2017/06/14	08:37:21	70.9
148	2017/06/14	08:37:24	67.2
149	2017/06/14	08:37:27	70.3
150	2017/06/14	08:37:30	67.6
151	2017/06/14	08:37:33	65.3
152	2017/06/14	08:37:36	68.6
153	2017/06/14	08:37:39	63.0
154	2017/06/14	08:37:42	65.5
155	2017/06/14	08:37:45	69.0
156	2017/06/14	08:37:48	71.4
157	2017/06/14	08:37:51	68.9
158	2017/06/14	08:37:54	70.4
159	2017/06/14	08:37:57	64.9
160	2017/06/14	08:38:00	61.4
161	2017/06/14	08:38:03	63.8
162	2017/06/14	08:38:06	66.8
163	2017/06/14	08:38:09	81.7
164	2017/06/14	08:38:12	79.4
165	2017/06/14	08:38:15	73.9
166	2017/06/14	08:38:18	73.5
167	2017/06/14	08:38:21	70.4
168	2017/06/14	08:38:24	68.9
169	2017/06/14	08:38:27	70.7
170	2017/06/14	08:38:30	68.7
171	2017/06/14	08:38:33	67.0
172	2017/06/14	08:38:36	66.4
173	2017/06/14	08:38:39	66.5
174	2017/06/14	08:38:42	68.5
175	2017/06/14	08:38:45	71.2
176	2017/06/14	08:38:48	66.2
177	2017/06/14	08:38:51	68.0
178	2017/06/14	08:38:54	61.2
179	2017/06/14	08:38:57	59.4
180	2017/06/14	08:39:00	62.9
181	2017/06/14	08:39:03	75.8
182	2017/06/14	08:39:06	74.2
183	2017/06/14	08:39:09	71.4
184	2017/06/14	08:39:12	62.0

185	2017/06/14	08:39:15	73.8
186	2017/06/14	08:39:18	70.5
187	2017/06/14	08:39:21	65.3
188	2017/06/14	08:39:24	69.9
189	2017/06/14	08:39:27	62.6
190	2017/06/14	08:39:30	66.1
191	2017/06/14	08:39:33	65.4
192	2017/06/14	08:39:36	64.0
193	2017/06/14	08:39:39	68.2
194	2017/06/14	08:39:42	74.8
195	2017/06/14	08:39:45	73.8
196	2017/06/14	08:39:48	69.2
197	2017/06/14	08:39:51	75.5
198	2017/06/14	08:39:54	74.0
199	2017/06/14	08:39:57	76.5
200	2017/06/14	08:40:00	73.1
201	2017/06/14	08:40:03	79.8
202	2017/06/14	08:40:06	72.3
203	2017/06/14	08:40:09	73.7
204	2017/06/14	08:40:12	69.4
205	2017/06/14	08:40:15	70.6
206	2017/06/14	08:40:18	69.8
207	2017/06/14	08:40:21	71.1
208	2017/06/14	08:40:24	69.3
209	2017/06/14	08:40:27	73.0
210	2017/06/14	08:40:30	66.2
211	2017/06/14	08:40:33	72.0
212	2017/06/14	08:40:36	69.0
213	2017/06/14	08:40:39	71.7
214	2017/06/14	08:40:42	65.8
215	2017/06/14	08:40:45	70.8
216	2017/06/14	08:40:48	71.8
217	2017/06/14	08:40:51	69.1
218	2017/06/14	08:40:54	63.3
219	2017/06/14	08:40:57	66.4
220	2017/06/14	08:41:00	66.2
221	2017/06/14	08:41:03	67.1
222	2017/06/14	08:41:06	57.5
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224	2017/06/14	08:41:12	68.4
225	2017/06/14	08:41:15	60.7
226	2017/06/14	08:41:18	66.9
227	2017/06/14	08:41:21	71.4
228	2017/06/14	08:41:24	69.4
229	2017/06/14	08:41:27	61.8
230	2017/06/14	08:41:30	70.2
231	2017/06/14	08:41:33	72.4
232	2017/06/14	08:41:36	72.1
233	2017/06/14	08:41:39	73.8
234	2017/06/14	08:41:42	76.5
235	2017/06/14	08:41:45	72.8
236	2017/06/14	08:41:48	72.7
237	2017/06/14	08:41:51	74.6
238	2017/06/14	08:41:54	70.0
239	2017/06/14	08:41:57	72.4
240	2017/06/14	08:42:00	65.8
241	2017/06/14	08:42:03	68.0
242	2017/06/14	08:42:06	68.8
243	2017/06/14	08:42:09	66.2
244	2017/06/14	08:42:12	62.4
245	2017/06/14	08:42:15	63.3
246	2017/06/14	08:42:18	69.8
247	2017/06/14	08:42:21	64.0
248	2017/06/14	08:42:24	73.8
249	2017/06/14	08:42:27	65.5
250	2017/06/14	08:42:30	71.3
251	2017/06/14	08:42:33	62.3
252	2017/06/14	08:42:36	75.0
253	2017/06/14	08:42:39	59.9
254	2017/06/14	08:42:42	58.3
255	2017/06/14	08:42:45	58.5
256	2017/06/14	08:42:48	67.8
257	2017/06/14	08:42:51	71.6
258	2017/06/14	08:42:54	71.7
259	2017/06/14	08:42:57	70.8
260	2017/06/14	08:43:00	74.0
261	2017/06/14	08:43:03	68.3
262	2017/06/14	08:43:06	67.5
263	2017/06/14	08:43:09	66.0
264	2017/06/14	08:43:12	64.7
265	2017/06/14	08:43:15	64.0
266	2017/06/14	08:43:18	73.4
267	2017/06/14	08:43:21	67.6
268	2017/06/14	08:43:24	70.2
269	2017/06/14	08:43:27	68.7
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271	2017/06/14	08:43:33	74.6
272	2017/06/14	08:43:36	73.6
273	2017/06/14	08:43:39	71.5
274	2017/06/14	08:43:42	72.4
275	2017/06/14	08:43:45	75.7
276	2017/06/14	08:43:48	65.8
277	2017/06/14	08:43:51	70.6
278	2017/06/14	08:43:54	75.9
279	2017/06/14	08:43:57	62.7
280	2017/06/14	08:44:00	71.1
281	2017/06/14	08:44:03	66.6
282	2017/06/14	08:44:06	68.0
283	2017/06/14	08:44:09	72.8

284	2017/06/14	08:44:12	68.6
285	2017/06/14	08:44:15	64.3
286	2017/06/14	08:44:18	60.7
287	2017/06/14	08:44:21	58.4
288	2017/06/14	08:44:24	69.1
289	2017/06/14	08:44:27	75.8
290	2017/06/14	08:44:30	60.9
291	2017/06/14	08:44:33	58.8
292	2017/06/14	08:44:36	58.6
293	2017/06/14	08:44:39	64.7
294	2017/06/14	08:44:42	69.6
295	2017/06/14	08:44:45	60.0
296	2017/06/14	08:44:48	61.6
297	2017/06/14	08:44:51	69.3
298	2017/06/14	08:44:54	70.9
299	2017/06/14	08:44:57	75.2
300	2017/06/14	08:45:00	70.8

Measurement 3

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 98.9 - 2017/06/14 09:00:07
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0
-

No.s	Date Time	(dB)
1	2017/06/14 08:56:46	65.4
2	2017/06/14 08:56:49	71.2
3	2017/06/14 08:56:52	64.5
4	2017/06/14 08:56:55	60.5
5	2017/06/14 08:56:58	64.9
6	2017/06/14 08:57:01	68.0
7	2017/06/14 08:57:04	71.0
8	2017/06/14 08:57:07	68.6
9	2017/06/14 08:57:10	67.4
10	2017/06/14 08:57:13	63.9
11	2017/06/14 08:57:16	62.0
12	2017/06/14 08:57:19	60.6
13	2017/06/14 08:57:22	58.6
14	2017/06/14 08:57:25	59.9
15	2017/06/14 08:57:28	58.7
16	2017/06/14 08:57:31	62.2
17	2017/06/14 08:57:34	58.8
18	2017/06/14 08:57:37	60.0
19	2017/06/14 08:57:40	60.5
20	2017/06/14 08:57:43	61.2
21	2017/06/14 08:57:46	62.4
22	2017/06/14 08:57:49	60.4
23	2017/06/14 08:57:52	60.7
24	2017/06/14 08:57:55	64.7
25	2017/06/14 08:57:58	61.9
26	2017/06/14 08:58:01	62.7
27	2017/06/14 08:58:04	61.5
28	2017/06/14 08:58:07	62.2
29	2017/06/14 08:58:10	64.1
30	2017/06/14 08:58:13	71.6
31	2017/06/14 08:58:16	71.3
32	2017/06/14 08:58:19	73.5
33	2017/06/14 08:58:22	70.9
34	2017/06/14 08:58:25	76.1
35	2017/06/14 08:58:28	73.9
36	2017/06/14 08:58:31	73.5
37	2017/06/14 08:58:34	80.4
38	2017/06/14 08:58:37	72.8
39	2017/06/14 08:58:40	65.7
40	2017/06/14 08:58:43	61.8
41	2017/06/14 08:58:46	66.7
42	2017/06/14 08:58:49	81.4
43	2017/06/14 08:58:52	70.9
44	2017/06/14 08:58:55	68.8
45	2017/06/14 08:58:58	66.4
46	2017/06/14 08:59:01	67.3
47	2017/06/14 08:59:04	63.0
48	2017/06/14 08:59:07	62.0
49	2017/06/14 08:59:10	63.4
50	2017/06/14 08:59:13	61.8
51	2017/06/14 08:59:16	62.0
52	2017/06/14 08:59:19	60.7
53	2017/06/14 08:59:22	58.7
54	2017/06/14 08:59:25	59.2
55	2017/06/14 08:59:28	59.2
56	2017/06/14 08:59:31	58.3
57	2017/06/14 08:59:34	63.8
58	2017/06/14 08:59:37	66.8
59	2017/06/14 08:59:40	67.7
60	2017/06/14 08:59:43	69.6
61	2017/06/14 08:59:46	70.3
62	2017/06/14 08:59:49	73.9
63	2017/06/14 08:59:52	70.6
64	2017/06/14 08:59:55	73.5
65	2017/06/14 08:59:58	69.7
66	2017/06/14 09:00:01	66.6
67	2017/06/14 09:00:04	70.7
68	2017/06/14 09:00:07	75.7
69	2017/06/14 09:00:10	69.2
70	2017/06/14 09:00:13	71.2
71	2017/06/14 09:00:16	70.0
72	2017/06/14 09:00:19	68.9
73	2017/06/14 09:00:22	72.1
74	2017/06/14 09:00:25	74.6
75	2017/06/14 09:00:28	73.6
76	2017/06/14 09:00:31	73.5
77	2017/06/14 09:00:34	73.1
78	2017/06/14 09:00:37	73.2
79	2017/06/14 09:00:40	73.3
80	2017/06/14 09:00:43	73.7
81	2017/06/14 09:00:46	73.7
82	2017/06/14 09:00:49	73.5
83	2017/06/14 09:00:52	79.6
84	2017/06/14 09:00:55	80.4
85	2017/06/14 09:00:58	71.5

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87	2017/06/14	09:01:04	66.6
88	2017/06/14	09:01:07	65.9
89	2017/06/14	09:01:10	61.5
90	2017/06/14	09:01:13	60.0
91	2017/06/14	09:01:16	58.9
92	2017/06/14	09:01:19	64.9
93	2017/06/14	09:01:22	66.5
94	2017/06/14	09:01:25	63.2
95	2017/06/14	09:01:28	63.3
96	2017/06/14	09:01:31	64.2
97	2017/06/14	09:01:34	62.8
98	2017/06/14	09:01:37	65.0
99	2017/06/14	09:01:40	65.0
100	2017/06/14	09:01:43	65.2
101	2017/06/14	09:01:46	66.7
102	2017/06/14	09:01:49	63.8
103	2017/06/14	09:01:52	65.5
104	2017/06/14	09:01:55	64.5
105	2017/06/14	09:01:58	63.7
106	2017/06/14	09:02:01	69.2
107	2017/06/14	09:02:04	77.5
108	2017/06/14	09:02:07	76.4
109	2017/06/14	09:02:10	73.0
110	2017/06/14	09:02:13	72.4
111	2017/06/14	09:02:16	77.3
112	2017/06/14	09:02:19	76.4
113	2017/06/14	09:02:22	76.6
114	2017/06/14	09:02:25	76.3
115	2017/06/14	09:02:28	73.7
116	2017/06/14	09:02:31	68.6
117	2017/06/14	09:02:34	68.1
118	2017/06/14	09:02:37	67.1
119	2017/06/14	09:02:40	59.8
120	2017/06/14	09:02:43	58.1
121	2017/06/14	09:02:46	59.6
122	2017/06/14	09:02:49	62.7
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126	2017/06/14	09:03:01	68.8
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128	2017/06/14	09:03:07	66.0
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136	2017/06/14	09:03:31	68.9
137	2017/06/14	09:03:34	68.1
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139	2017/06/14	09:03:40	69.3
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196	2017/06/14	09:06:31	61.0
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254	2017/06/14	09:09:25	68.4
255	2017/06/14	09:09:28	66.7
256	2017/06/14	09:09:31	60.2
257	2017/06/14	09:09:34	55.2
258	2017/06/14	09:09:37	56.3
259	2017/06/14	09:09:40	58.4
260	2017/06/14	09:09:43	62.9
261	2017/06/14	09:09:46	64.5
262	2017/06/14	09:09:49	68.7
263	2017/06/14	09:09:52	64.5
264	2017/06/14	09:09:55	59.4
265	2017/06/14	09:09:58	59.2
266	2017/06/14	09:10:01	61.4
267	2017/06/14	09:10:04	65.9
268	2017/06/14	09:10:07	66.8
269	2017/06/14	09:10:10	76.0
270	2017/06/14	09:10:13	69.9
271	2017/06/14	09:10:16	76.0
272	2017/06/14	09:10:19	64.9
273	2017/06/14	09:10:22	63.2
274	2017/06/14	09:10:25	61.0
275	2017/06/14	09:10:28	65.0
276	2017/06/14	09:10:31	62.7
277	2017/06/14	09:10:34	66.9
278	2017/06/14	09:10:37	70.8
279	2017/06/14	09:10:40	71.5
280	2017/06/14	09:10:43	71.1
281	2017/06/14	09:10:46	72.0
282	2017/06/14	09:10:49	73.6
283	2017/06/14	09:10:52	75.9

284	2017/06/14	09:10:55	79.8
285	2017/06/14	09:10:58	72.2
286	2017/06/14	09:11:01	66.4
287	2017/06/14	09:11:04	61.5
288	2017/06/14	09:11:07	63.7
289	2017/06/14	09:11:10	63.1
290	2017/06/14	09:11:13	66.0
291	2017/06/14	09:11:16	63.4
292	2017/06/14	09:11:19	59.6
293	2017/06/14	09:11:22	61.8
294	2017/06/14	09:11:25	62.9
295	2017/06/14	09:11:28	65.5
296	2017/06/14	09:11:31	61.3
297	2017/06/14	09:11:34	55.8
298	2017/06/14	09:11:37	55.0
299	2017/06/14	09:11:40	58.8
300	2017/06/14	09:11:43	65.3

Construction Noise Model Data

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 7/21/2017
Case Descr Red Hill Specific Plan Demolition

		Baselines (dBA)			---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night	
Residences	Residential	70	65	60	

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50	0
Excavator	No	40		80.7	50	0
Excavator	No	40		80.7	50	0
Concrete Saw	No	20		89.6	50	0
Dozer	No	40		81.7	50	0
Dozer	No	40		81.7	50	0

	Calculated (dBA)		Results	Noise Limits (dBA)		
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A
Total	89.6	86.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/21/2017
Case Descrip Red Hill Specific Plan Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences	Residential	70	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	50	0
Backhoe	No	40		77.6	50	0
Backhoe	No	40		77.6	50	0
Backhoe	No	40		77.6	50	0
Dozer	No	40		81.7	50	0
Dozer	No	40		81.7	50	0
Dozer	No	40		81.7	50	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Dozer		81.7	77.7	N/A	N/A	N/A	N/A
Dozer		81.7	77.7	N/A	N/A	N/A	N/A
Dozer		81.7	77.7	N/A	N/A	N/A	N/A
	Total	81.7	84.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/21/2017
Case Descrip Red Hill Specific Plan Grading

		Baselines (dBA)			---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night	
Residences	Residential	70	65	60	

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50	0
Excavator	No	40		80.7	50	0
Grader	No	40	85		50	0
Backhoe	No	40		77.6	50	0
Backhoe	No	40		77.6	50	0
Dozer	No	40		81.7	50	0
Scraper	No	40		83.6	50	0
Scraper	No	40		83.6	50	0

		Calculated (dBA)		Results Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		80.7	76.7	N/A	N/A	N/A	N/A
Excavator		80.7	76.7	N/A	N/A	N/A	N/A
Grader		85	81	N/A	N/A	N/A	N/A
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Backhoe		77.6	73.6	N/A	N/A	N/A	N/A
Dozer		81.7	77.7	N/A	N/A	N/A	N/A
Scraper		83.6	79.6	N/A	N/A	N/A	N/A
Scraper		83.6	79.6	N/A	N/A	N/A	N/A
	Total	85	87.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/21/2017
Case Descriptic Red Hill Specific Plan Building Construction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences	Residential	70	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
Forklift	No	50		83	50	0
Forklift	No	50		83	50	0
Forklift	No	50		83	50	0
Generator	No	50		80.6	50	0
Backhoe	No	40		77.6	50	0
Backhoe	No	40		77.6	50	0
Backhoe	No	40		77.6	50	0
Welder / Torch	No	40		74	50	0

			Results				
	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A
Forklift	83	80	N/A	N/A	N/A	N/A	N/A
Forklift	83	80	N/A	N/A	N/A	N/A	N/A
Forklift	83	80	N/A	N/A	N/A	N/A	N/A
Generator	80.6	77.6	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74	70	N/A	N/A	N/A	N/A	N/A
Total	83	86.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/21/2017
Case Descrip Red Hill Specific Plan Paving

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences	Residential	70	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Roller	No	20		80	50	0
Paver	No	50		77.2	50	0
Paver	No	50		77.2	50	0

			Results			
	Calculated (dBA)			Noise Limits (dBA)		
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	77.2	74.2	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A
Total	80	81.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Report date: 7/21/2017
Case Description: Red Hill Specific Plan
Architectural Coating

		Baselines (dBA)			---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night	
Residences	Residential	70	65	60	

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		77.7	73.7	N/A	N/A	N/A	N/A
	Total	77.7	73.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Noise Contour Data

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Red Hill Specific Plan
Project Number: 94914001
Scenario: Existing
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Red Hill Ave	Bryan Avenue to San Juan Street	6	12	21,800	40	0	4.6%	12.3%	71.3	135	425	1,346	4,255
2	Red Hill Ave	San Juan Street to El Camino Real	6	12	25,900	40	0	4.6%	12.3%	72.0	160	506	1,599	5,055
3	Red Hill Ave	Nisson Road to Mitchell Avenue	6	12	29,200	40	0	4.6%	12.3%	72.6	180	570	1,802	5,699
4	Red Hill Ave	Mitchell Avenue to Walnut Avenue	6	12	26,700	40	0	4.6%	12.3%	72.2	165	521	1,648	5,211
5	Red Hill Ave	Walnut Avenue to Sycamore Avenue	6	12	27,700	40	0	4.6%	12.3%	72.3	171	541	1,710	5,406

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Red Hill Specific Plan
Project Number: 94914001
Scenario: Existing Plus Project
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Red Hill Ave	Bryan Avenue to San Juan Street	6	12	24,300	40	0	4.6%	12.3%	71.8	150	474	1,500	4,743
2	Red Hill Ave	San Juan Street to El Camino Real	6	12	34,700	40	0	4.6%	12.3%	73.3	214	677	2,142	6,773
3	Red Hill Ave	Nisson Road to Mitchell Avenue	6	12	35,500	40	0	4.6%	12.3%	73.4	219	693	2,191	6,929
4	Red Hill Ave	Mitchell Avenue to Walnut Avenue	6	12	31,200	40	0	4.6%	12.3%	72.8	193	609	1,926	6,090
5	Red Hill Ave	Walnut Avenue to Sycamore Avenue	6	12	30,000	40	0	4.6%	12.3%	72.7	185	586	1,852	5,855

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Red Hill Specific Plan
Project Number: 94914001
Scenario: Horizon Year
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Red Hill Ave	Bryan Avenue to San Juan Street	6	12	21,800	40	0	4.6%	12.3%	71.3	135	425	1,346	4,255
2	Red Hill Ave	San Juan Street to El Camino Real	6	12	25,900	40	0	4.6%	12.3%	72.0	160	506	1,599	5,055
3	Red Hill Ave	Nisson Road to Mitchell Avenue	6	12	29,200	40	0	4.6%	12.3%	72.6	180	570	1,802	5,699
4	Red Hill Ave	Mitchell Avenue to Walnut Avenue	6	12	28,700	40	0	4.6%	12.3%	72.5	177	560	1,771	5,602
5	Red Hill Ave	Walnut Avenue to Sycamore Avenue	6	12	27,700	40	0	4.6%	12.3%	72.3	171	541	1,710	5,406

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Red Hill Specific Plan
Project Number: 94914001
Scenario: Horizon Year Plus Project
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Red Hill Ave	Bryan Avenue to San Juan Street	6	12	24,300	40	0	4.6%	12.3%	71.8	150	474	1,500	4,743
2	Red Hill Ave	San Juan Street to El Camino Real	6	12	34,700	40	0	4.6%	12.3%	73.3	214	677	2,142	6,773
3	Red Hill Ave	Nisson Road to Mitchell Avenue	6	12	35,500	40	0	4.6%	12.3%	73.4	219	693	2,191	6,929
4	Red Hill Ave	Mitchell Avenue to Walnut Avenue	6	12	33,200	40	0	4.6%	12.3%	73.1	205	648	2,049	6,480
5	Red Hill Ave	Walnut Avenue to Sycamore Avenue	6	12	30,000	40	0	4.6%	12.3%	72.7	185	586	1,852	5,855

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

APPENDIX F

TRAFFIC

Traffic Impact Study

for:

Red Hill Avenue Specific Plan

In the City of Tustin

Prepared for:

The City of Tustin

January, 2018

Kimley»Horn

TRAFFIC IMPACT STUDY
FOR THE
RED HILL AVENUE SPECIFIC PLAN

Prepared for:

The City of Tustin
300 Centennial Way
Tustin, CA 92780

Prepared by:

Kimley-Horn and Associates, Inc.
765 The City Drive
Suite 200
Orange, California 92868

January, 2018

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TRAFFIC IMPACT STUDY
FOR THE
RED HILL AVENUE SPECIFIC PLAN

INTRODUCTION

The purpose of this report is to address the traffic-related impacts associated with the proposed Red Hill Avenue Specific Plan in the City of Tustin. The Specific Plan covers an area of approximately 36 acres along Red Hill Avenue, generally between Bryan Avenue to the north, and Walnut Avenue to the south. Figure 1 shows the project vicinity, and Figure 2 shows the Red Hill Avenue Specific Plan area boundaries.

The Red Hill Avenue Specific Plan project consists of implementation of new development densities and standards, which will allow the potential for development of additional residential and non-residential development along the Red Hill Avenue corridor.

This traffic study includes documentation of Existing Conditions and Long-Range Future conditions without and with the Project, and identification of project-related impacts and mitigation. The traffic impact analysis will focus on the impact of the project traffic within the project vicinity, and will address morning and evening peak hour operating conditions at nine study intersections and five roadway segments.

PROJECT DESCRIPTION

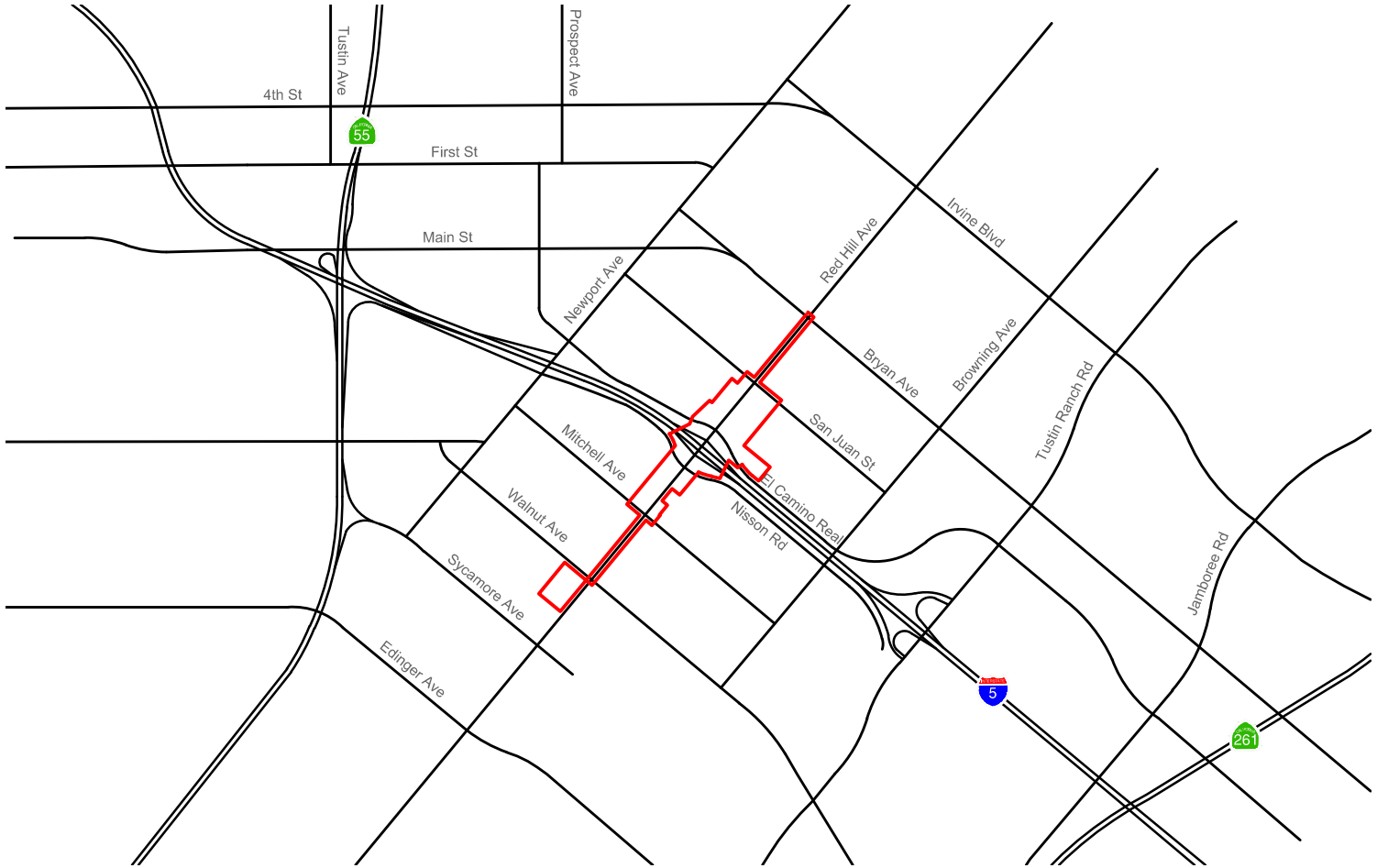
Red Hill Avenue is a major arterial roadway, oriented northeast to southwest through the City of Tustin. The Specific Plan area is located along Red Hill Avenue, generally between Bryan Avenue on the north and Walnut Avenue on the south. The Specific Plan area is bisected by the Interstate 5 (I-5) Freeway.

The area is currently developed with a mix of low-intensity commercial, retail, and office uses. There are also vacant parcels within the project area.

The proposed Red Hill Avenue Specific Plan will result in the potential for development of approximately 325,000 square feet of non-residential uses, as well as 500 new residential units. The development thresholds identified in the proposed Specific Plan are as follows:

City of Tustin Red Hill Avenue Specific Plan Development Potential		
Land Use	Quantity	Unit
Residential	500	DU
Non-residential uses	325,000	SF

NOT TO SCALE



LEGEND:
= Specific Plan Boundary

FIGURE 1
VICINITY MAP

Kimley»Horn

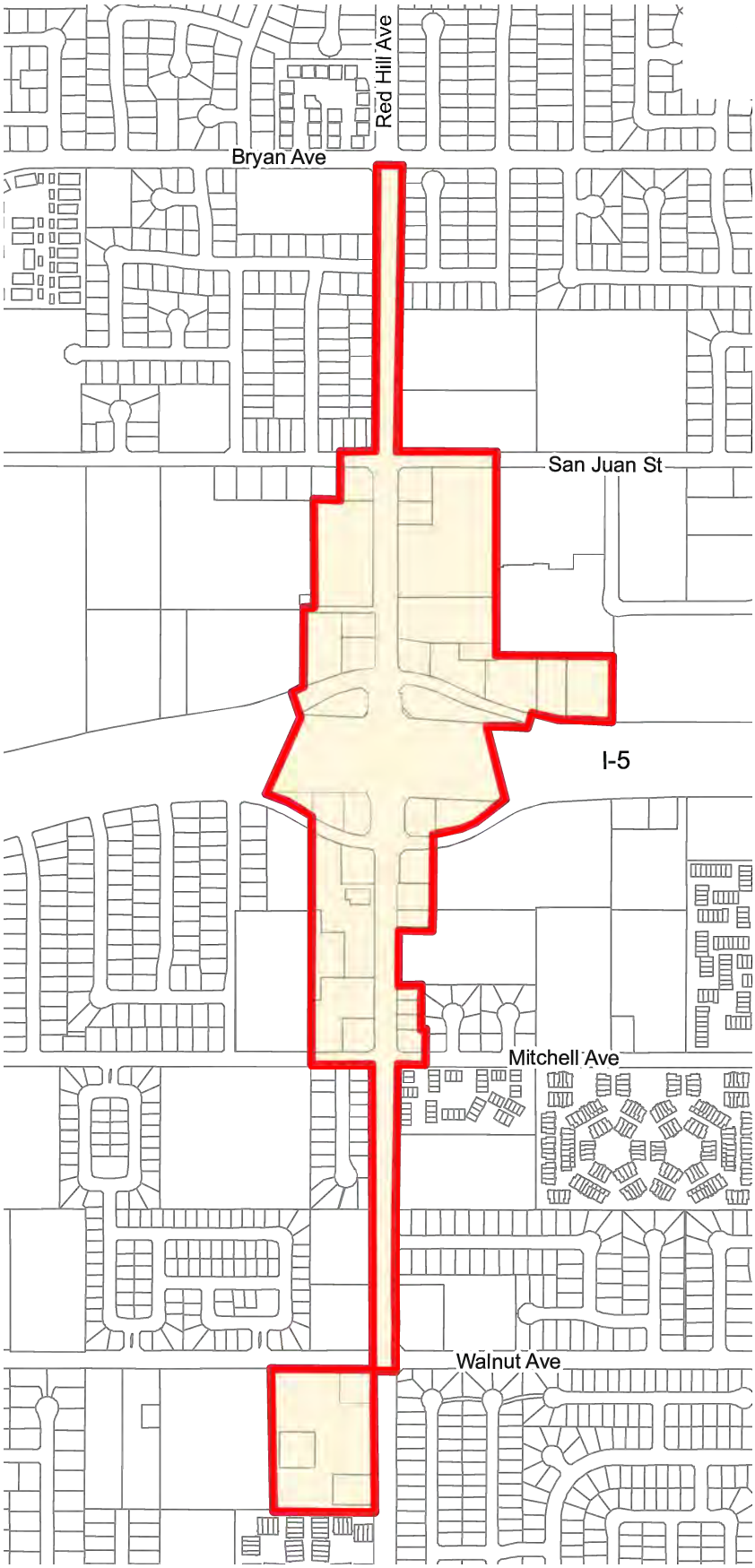


FIGURE 2
RED HILL AVENUE SPECIFIC PLAN AREA

Kimley»Horn

More specifically, it is anticipated that approximately 395 residential units and 175,000 square feet of non-residential uses may be developed north of the I-5 Freeway, and 105 residential units and 150,000 square feet of non-residential uses may be developed south of the I-5 Freeway. Potential streetscape improvements include the addition of raised medians along some segments of Red Hill Avenue, and a traffic signal serving the development areas north of the I-5 Freeway.

This maximum development potential for the Red Hill Avenue corridor represents net new development quantities over and above existing development in the area. Project development is expected to occur over the next 20 years or more, as market conditions and property owner interests allow.

STUDY METHODOLOGY AND SIGNIFICANCE CRITERIA

This traffic impact study has been prepared in accordance with the study requirements of the City of Tustin. A description of the analysis methodology, Level of Service standards, and significance criteria applied in this traffic impact analysis is provided below.

Traffic Impact Analysis Scenarios

The traffic impact analysis has been conducted to evaluate morning and evening peak hour conditions at the study intersections. The following scenarios are analyzed:

- Existing Conditions
- Existing Plus Project
- Long-Range Future Conditions
- Long-Range Future With Project

Study Area

The study area was developed in consultation with the City of Tustin staff. Traffic impact analyses were conducted for the following study intersections:

Study Intersections

1. Red Hill Avenue at Bryan Avenue
2. Red Hill Avenue at San Juan Street
3. Red Hill Avenue at El Camino Real
4. Red Hill Avenue at I-5 NB Ramps
5. Red Hill Avenue at I-5 SB Ramps
6. Red Hill Avenue at Nisson Road
7. Red Hill Avenue at Mitchell Avenue
8. Red Hill Avenue at Walnut Avenue
9. Red Hill Avenue at Sycamore Avenue

The location of the study intersections with existing lane configurations and traffic control are shown on Figure 3.

In addition, the following roadway segments were analyzed:

- Red Hill Avenue: Bryan Avenue to San Juan Street
- Red Hill Avenue: San Juan Street to El Camino Real
- Red Hill Avenue: Nisson Road to Mitchell Avenue
- Red Hill Avenue: Mitchell Avenue to Walnut Avenue
- Red Hill Avenue: Walnut Avenue to Sycamore Avenue

Intersection Analysis Methodology

City of Tustin Intersections

All of the study intersections are signalized. In accordance with the requirements of the City of Tustin, peak hour operating conditions at the signalized intersections were evaluated using the Intersection Capacity Utilization (ICU) methodology. The ICU methodology provides a comparison of the theoretical hourly vehicular capacity of an intersection to the number of vehicles actually passing through that intersection during a given hour.

The ICU calculation assumes a per-lane capacity of 1,700 vehicles per hour (vph) for each travel lane (through or turning lane) through the intersection. A clearance factor of 0.05 is included in the ICU calculation. The ICU calculation returns a volume-to-capacity (V/C) ratio that translates into a corresponding Level of Service (LOS) measure, ranging from LOS A, representing uncongested, free-flowing conditions, to LOS F, representing severely congested, over-capacity conditions. A summary description of each Level of Service and the corresponding V/C ratio is provided in the chart on the following page.

Caltrans Intersections

Any intersection located on a State Highway (Caltrans) facility will also be evaluated using the Highway Capacity Manual (HCM) methodology for signalized intersections, as required by the Caltrans *Guide for the Preparation of Traffic Impact Studies* (June 2001).

The HCM methodology estimates the average delay (in average seconds per vehicle) for each of the movements through the intersection, depending on a number of factors, including the number of through and turn lanes, volume of traffic, and signal cycle length and timing. Just as with the ICU methodology, the HCM delay forecast translates to a Level of Service designation, ranging from LOS "A" to LOS "F". A summary description of each Level of Service for the HCM signalized intersection methodology, and the corresponding delay, expressed in seconds per vehicle, is provided on the chart on the following page.

Roadway Segment Analysis

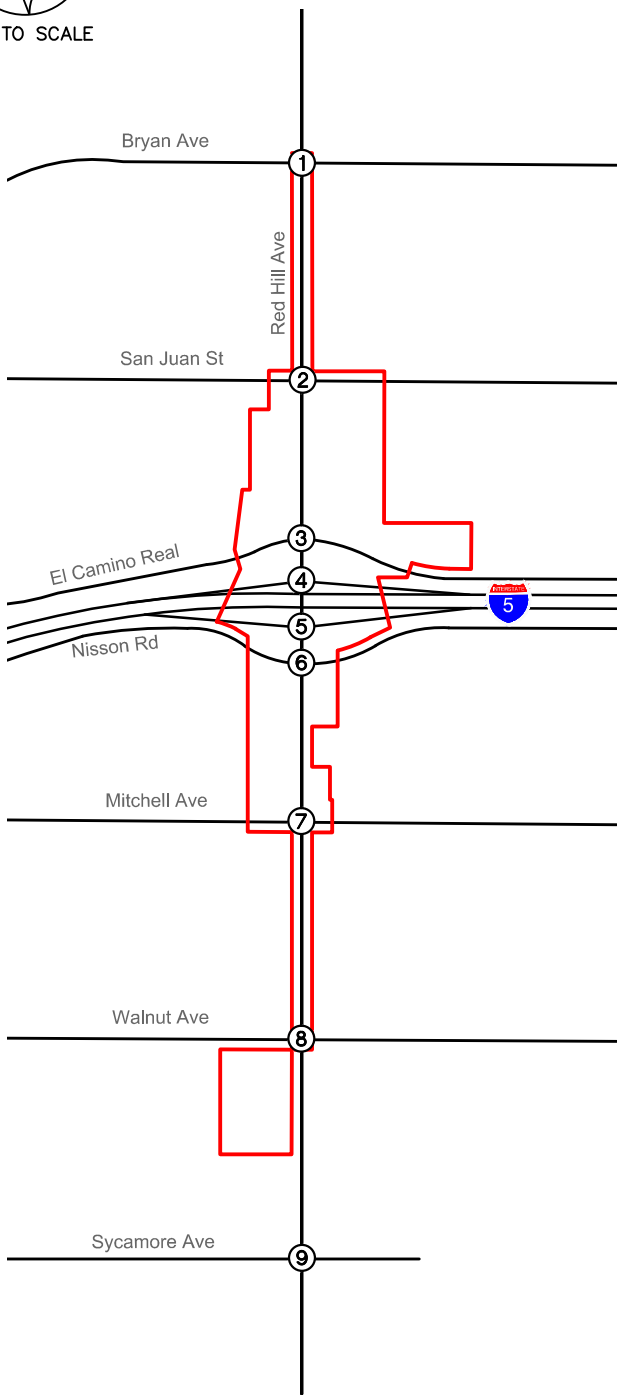
The roadway segment analysis will address the project's impact on daily operating conditions on roadway segments within the project vicinity. Roadway segments are evaluated by comparing the traffic volume on a roadway segment to the daily capacity of that segment, to determine the volume-to-capacity (v/c) ratio. Daily capacity is based on the roadway classification, as shown in the chart on the following page.

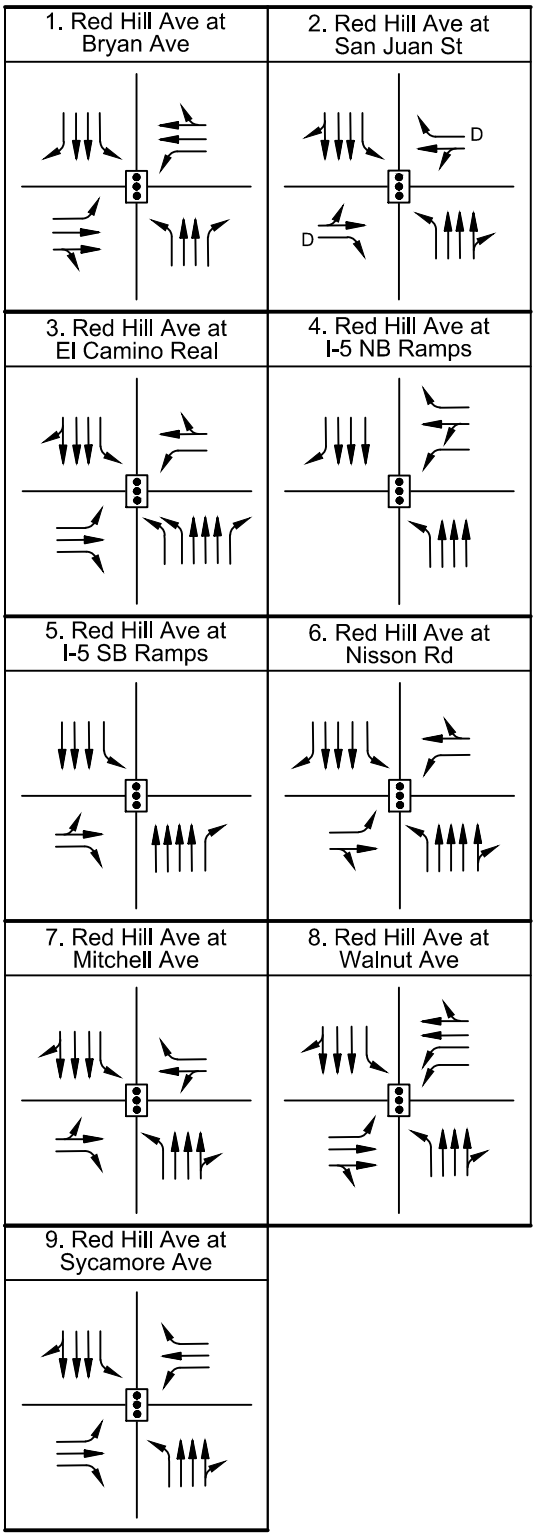
LEVEL OF SERVICE DESCRIPTIONS SIGNALIZED INTERSECTIONS		
Level of Service	ICU Value	Description
A	0.00 - 0.60	EXCELLENT – No vehicle waits longer than one red light and no approach phase is fully used.
B	0.61 - 0.70	VERY GOOD – An occasional approach phase is fully utilized; drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 - 0.80	GOOD – Occasionally drivers may have to wait through more than one red light; back-ups may develop behind turning vehicles
D	0.81 - 0.90	FAIR – Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive back-ups.
E	0.91 - 1.00	POOR – Represents the most vehicles that the intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.00	FAILURE – Back-ups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Extensive delays with continuously increasing queue lengths.

CITY OF TUSTIN ROADWAY CAPACITY		
Facility Type (No. of Lanes)	Two-Way Traffic Volume (ADT)	
	LOS **D**	LOS **E**
Major (8 lanes divided)	67,500	75,000
Major (6 lanes divided)	50,600	56,300
Primary (4 lanes divided)	33,800	37,500
Secondary (4 lanes undivided)	22,500	25,000
Collector (2 lanes undivided)	11,300	12,500

Source: City of Tustin's General Plan *Circulation Element* (2008)

NOT TO SCALE





LEGEND:

- X = Study Intersection
- = Specific Plan Boundary
- = Signal
- D = De Facto Right-Turn Lane

FIGURE 3
EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

Level of Service Standard and Performance Criteria

Level of Service Standards

The City of Tustin Circulation Element of the General Plan has established that the Level of Service standard for intersection and roadway operation in the City is LOS D. Due to the significant amount of regional traffic in some areas of the City, LOS E is the recommended standard for Irvine Boulevard, Edinger Avenue, and Jamboree Road south of Irvine Boulevard.

For purposes of this study, the target Level of Service for all study intersections and roadway segments will be Level of Service D. Where necessary, improvements to achieve Level of Service D will be identified.

EXISTING TRANSPORTATION SYSTEM

Regional access to the Specific Plan area is provided by the I-5 Freeway. The I-5 Freeway runs generally in a northwest-southeast orientation and bisects the Specific Plan area. There are direct off- and on-ramps to Red Hill Avenue for the I-5 freeway.

Local access to the project area is provided by a number of local major and minor roadways leading to and from the project area. The following provides a description of the existing roadway characteristics in the Specific Plan area.

Red Hill Avenue – Red Hill Avenue is a six-lane divided roadway, with three travel lanes in each direction and a center two-way left-turn lane. Within the study area, Red Hill Avenue provides access to the I-5 Freeway via a tight diamond interchange. The posted speed limit along Red Hill Avenue is 40 miles per hour (mph) and on-street parking is prohibited. Red Hill Avenue is designated as a 6-Lane Major arterial on the Arterial Highway Plan (Figure C-2) of the City of Tustin's General Plan. A 6-Lane Major roadway would provide 3 travel lanes in each direction with a raised center median within 120 feet of right-of-way.

Bryan Avenue – Bryan Avenue is a four-lane undivided roadway. Its intersection with Red Hill Avenue is signalized. The posted speed limit along Bryan Avenue is 40 mph west of Red Hill Avenue and 45 mph east of Red Hill Avenue. Bryan Avenue is designated as a Secondary arterial on the City's Arterial Highway Plan. A Secondary arterial provides 2 travel lanes in each direction within 80 feet of right-of-way; or may include Class II bicycle lanes, within 92 feet of right-of-way.

San Juan Street – San Juan Street is a local two-lane undivided roadway which provides local access to adjacent residential and school uses. Its intersection with Red Hill Avenue is signalized. The posted speed limit along San Juan Street is 30 mph, with a 25-mph school zone east of Red Hill Avenue

El Camino Real – El Camino Real is a four-lane divided roadway with a two-way left-turn lane west of Red Hill Avenue, and a two-lane divided roadway with a two-way left-turn lane east of Red Hill Avenue. Its intersection with Red Hill Avenue is signalized. El Camino Real is designated as a Secondary arterial on the City's Arterial Highway Plan.

Nisson Road – Nisson Road is a two-lane undivided roadway which provides local access to adjacent residential and business parcels. Its intersection with Red Hill Avenue is signalized. The posted speed limit along Nisson Road is 35 miles per hour. The westbound approach of Nisson Road at Red Hill Avenue is posted with the following turn restriction: "No Turn on Red, 7 – 9 AM, 4 – 6 PM Weekdays".

Mitchell Avenue – Mitchell Avenue is a two-lane undivided roadway, which provides local access to adjacent residential and business parcels. Its intersection with Red Hill Avenue is signalized. The posted speed limit along Mitchell Avenue is 30 mph, with a 25-mph school zone west of Red Hill Avenue.

Walnut Avenue – Walnut Avenue is a four-lane divided roadway with a two-way left-turn lane west of Red Hill Avenue, and a two-lane divided roadway with a two-way left-turn lane east of Red Hill Avenue. Its intersection with Red Hill Avenue is signalized. The posted speed limit is 40 miles per hour. Walnut Avenue is designated as a Modified Primary arterial on the City's Arterial Highway Plan. A Modified Primary would provide 2 travel lanes in each direction with a raised or painted median.

Public Transportation Service

The Orange County Transportation Authority (OCTA) operates local public transit service throughout Orange County, including in the City of Tustin and through the study area. OCTA Routes 66, 71, and 79 currently serve the study area.

Route 66 operates between Huntington Beach and Irvine, traveling along Walnut Avenue and McFadden Avenue in the City of Tustin. Service is provided every day with an approximate headway (the time interval between bus arrivals) of 30 minutes on weekdays and 60 minutes on weekends and holidays.

Route 71 operates between Newport Beach and Yorba Linda, traveling along Tustin Avenue, First Street, El Camino Real, Newport Avenue, and Red Hill Avenue in the City of Tustin. Service is provided every day with an approximate headway of 30 minutes on weekdays and 50 to 60 minutes on weekends and holidays.

Route 79 operates between Tustin and Newport Beach, traveling along First Street, Newport Avenue, Centennial Way and Main Street / Bryan Avenue in the City of Tustin. Service is provided every day with an approximate headway of 30 minutes on weekdays and 60 minutes on weekends and holidays.

Within the study area, bus stops are provided at the following locations:

- on Bryan Avenue, east and west of Red Hill Avenue;
- on both sides of El Camino Real, west of Red Hill Avenue.
- on the west side of Red Hill Avenue, south of Nisson Road; and
- on Red Hill Avenue, north and south of Mitchell Avenue;
- on both sides of Walnut Avenue, east of Red Hill Avenue;
- on both sides of Red Hill Avenue, south of Walnut Avenue.

Bicycle Facilities

Within the study area, the only existing bicycle facility is a Class II bike lane (a striped, on-street bicycle lane adjacent to the travel lane) on both sides of Red Hill Avenue, between El Camino Real and Nisson Road. The City's Master Bikeway Plan (Figure C-5 of the Circulation Element) shows the entire extent of Red Hill Avenue within the City limits as a designated or a potential Class II bikeway.

EXISTING TRAFFIC CONDITIONS

Traffic Volumes

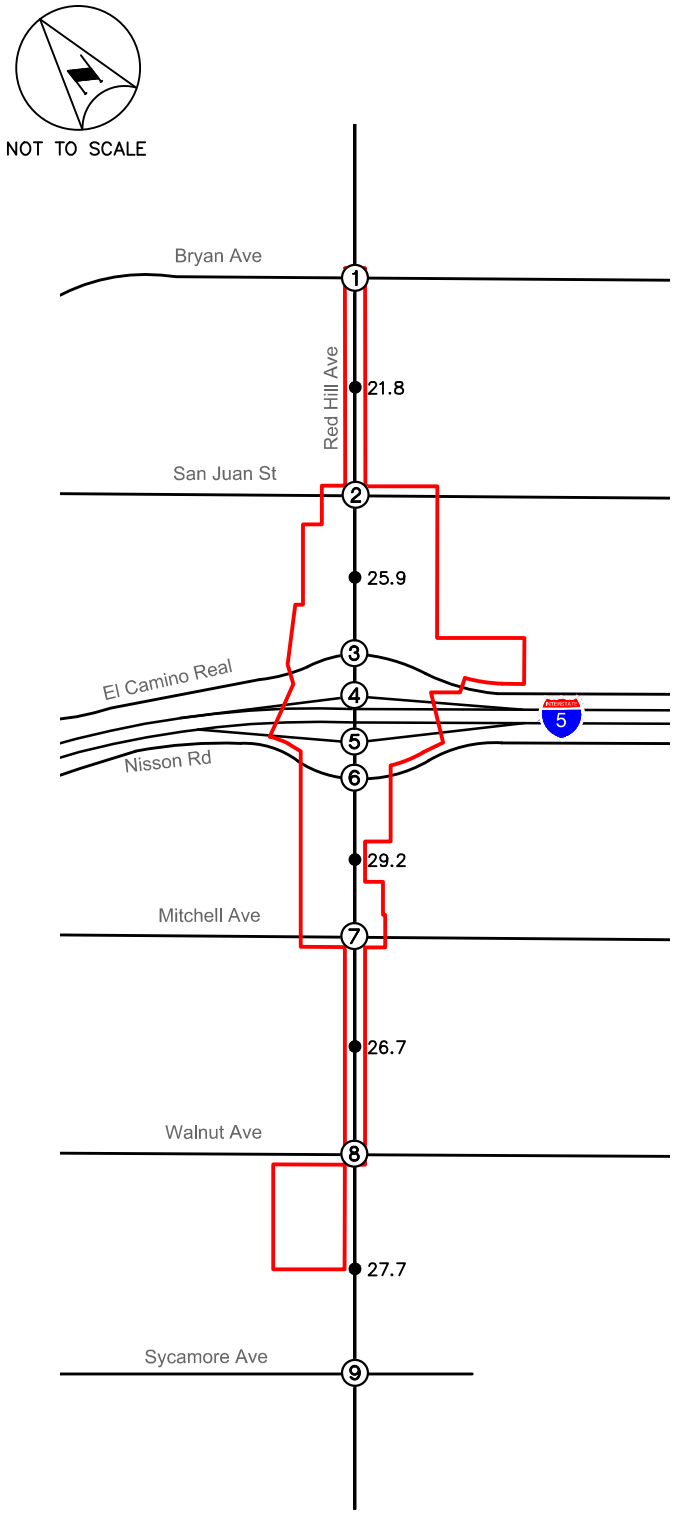
Existing morning and evening peak hour turning movement volumes, as well as daily roadway volumes, were collected in March, 2017. Existing traffic volumes at the study intersections and on the study roadway segments are shown on Figure 4. Copies of the traffic count worksheets are provided in *Appendix A* of this report.

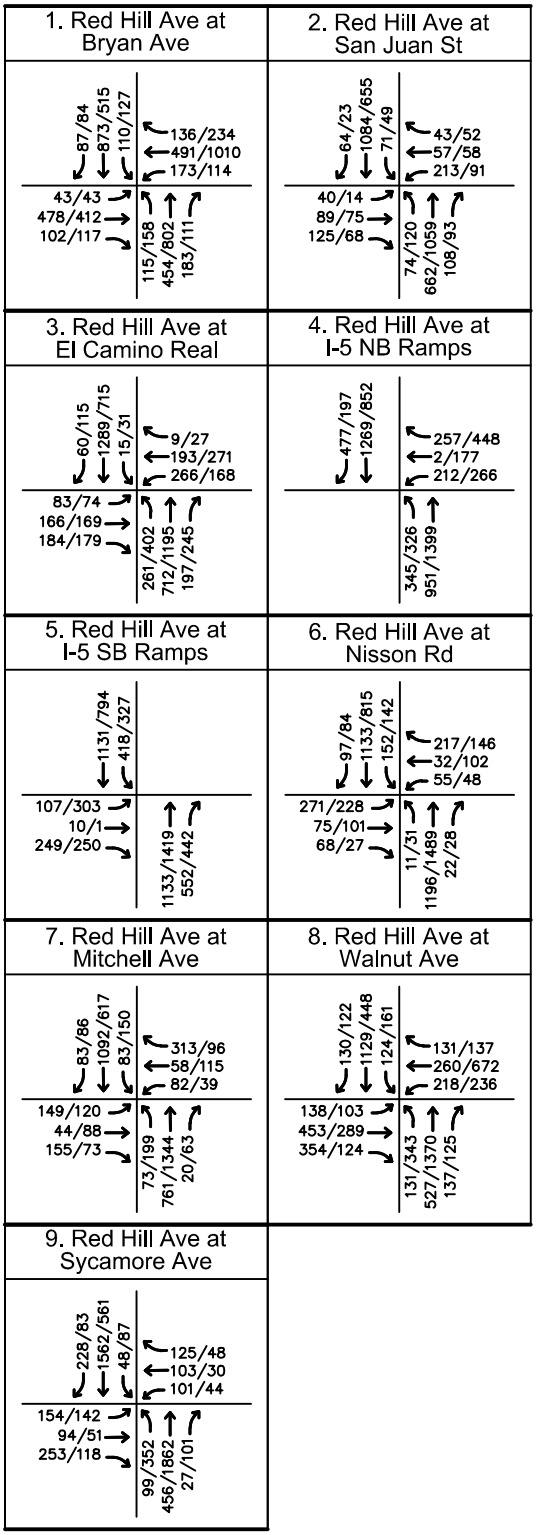
Peak Hour Operating Conditions

Existing operating conditions at the study intersections during the morning and evening peak hours are summarized on Table 1. This table shows that all study intersections are currently operating at an acceptable Level of Service in both peak hours. Copies of the intersection analysis worksheets are provided in *Appendix B* of this report.

Daily Roadway Operating Conditions

Roadway Level of Service analysis was conducted based on the roadway capacities presented previously in this report. The results of the roadway analysis for Existing Conditions are shown on Table 2. Review of this table indicates that the study roadway segments are currently operating within their current Level of Service D capacity.





LEGEND:

- Ⓧ = Study Intersection
- = Specific Plan Boundary
- XX/YY = AM/PM Peak Hour Turning Movement Volumes
- ZZ.Z = Average Daily Traffic Volume (1,000's)

FIGURE 4
EXISTING TRAFFIC VOLUMES

TABLE 1
SUMMARY OF INTERSECTION OPERATION
EXISTING CONDITIONS

ICU Methodology

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			ICU	LOS	ICU	LOS
1	Red Hill Avenue at Bryan Avenue	S	0.65	B	0.75	C
2	Red Hill Avenue at San Juan Street	S	0.52	A	0.41	A
3	Red Hill Avenue at El Camino Real	S	0.66	B	0.55	A
4	Red Hill Avenue at I-5 NB Ramps	S	0.60	A	0.57	A
5	Red Hill Avenue at I-5 SB Ramps	S	0.68	B	0.68	B
6	Red Hill Avenue at Nisson Road	S	0.62	B	0.64	B
7	Red Hill Avenue at Mitchell Avenue	S	0.60	A	0.58	A
8	Red Hill Avenue at Walnut Avenue	S	0.68	B	0.74	C
9	Red Hill Avenue at Sycamore Ave	S	0.67	B	0.60	A

HCM Methodology

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
4	Red Hill Avenue at I-5 NB Ramps	S	20.3	B	22.5	C
5	Red Hill Avenue at I-5 SB Ramps	S	21.6	B	22.4	C

Notes:
- S = Signalized
- ICU = Intersection Capacity Utilization
- HCM = Highway Capacity Manual
- LOS = Level of Service
- Bold and shaded values indicate intersections operating at LOS E or F per City standards.
- Intersection operation is expressed in terms of volume-to-capacity (V/C) ratio using the ICU methodology.
- Intersection operation is expressed in average seconds of delay (del/veh) ratio for HCM methodology.

TABLE 2
SUMMARY OF ROADWAY ANALYSIS
EXISTING CONDITIONS

Roadway	Segment	LOS **D** Capacity	Existing ADT	LOS D or Better?
Red Hill Avenue	Bryan Avenue to San Juan Street	50,600	21,800	Yes
	San Juan Street to El Camino Real	50,600	25,900	Yes
	Nisson Road to Mitchell Avenue	50,600	29,200	Yes
	Mitchell Avenue to Walnut Avenue	50,600	26,700	Yes
	Walnut Avenue to Sycamore Avenue	50,600	27,700	Yes

Notes: LOS = Level of Service
ADT = Average Daily Traffic

PROJECT TRAFFIC

The Red Hill Avenue Specific Plan project represents the potential for development of additional residential and non-residential uses throughout the Specific Plan area. The Specific Plan would provide for the following development thresholds of potential new growth:

- Multi-family Residential – 500 units
- Non-residential uses – 325,000 square feet

Although no actual development plans have yet been presented, the Specific Plan has identified opportunity areas throughout the Specific Plan area. The circulation plan in the Red Hill Avenue Specific Plan (Exhibit 4-3: Circulation Plan) also identifies potential streetscape and circulation improvements that include the addition of raised medians along some segments of Red Hill Avenue, and a traffic signal serving the opportunity areas north of the I-5 Freeway. A copy of Exhibit 4-3: Circulation Plan from the Specific Plan is provided in *Appendix C*.

Project Trip Generation

Some of the Specific Plan opportunity areas are currently developed with existing, occupied and operating uses. The development potential identified in the Specific Plan represents development increases over existing development levels along Red Hill Avenue, and may, in some cases, represent new development that replaces a prior existing use. Trip generation for the development contemplated by the Specific Plan, therefore, represents the net new trip-making potential, over and above traffic currently being generated by existing uses in the Specific Plan area.

Trip generation estimates for the project were developed using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition (2012). The multi-family residential component of the project could be developed as condominium / townhomes or as apartments. Of the two, the trip rates for apartments are higher. For a more conservative traffic analysis, the higher trip rates for apartments were used. Also for a more conservative analysis, no trip reductions were taken for internal trip capture or pass-by trips.

Resulting project trip generation rates and trip estimates are shown on Table 3. The Specific Plan development potential represents the addition of approximately 17,836 trips per day, with 641 (285 inbound and 356 outbound) trips in the morning peak hour, and 1,562 (811 inbound and 751 outbound) trips in the evening peak hour.

TABLE 3
SUMMARY OF PROJECT TRIP GENERATION
RED HILL CORRIDOR SPECIFIC PLAN

Land Use	ITE Code	Unit	Trip Generation Rates [1]						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment	220	DU	6.650	0.102	0.408	0.510	0.403	0.217	0.620
Shopping Center	820	KSF	42.700	0.595	0.365	0.960	1.781	1.929	3.710
High-Turnover (Sit-Down) Restaurant	932	KSF	127.150	5.946	4.865	10.810	5.910	3.940	9.850

Land Use	Quantity	Unit	Trip Generation Estimates						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment	500	DU	3,325	51	204	255	202	109	311
Shopping Center	317.500	KSF	13,557	189	116	305	565	612	1,177
High-Turnover (Sit-Down) Restaurant	7.500	KSF	954	45	36	81	44	30	74
Total Project Trips			17,836	285	356	641	811	751	1,562

[1] Source: Institute of Transportation Engineers publication: Trip Generation Manual, 9th Edition

Project Trip Distribution and Assignment

Development is anticipated to take place on a number of opportunity sites throughout the Specific Plan area. Project traffic will approach and depart the development areas via the existing street system, similar to current traffic patterns. Project trip distribution assumptions for the project area were developed by reviewing existing travel patterns and taking into account the proposed mix of uses and the location of area trip producers, such as residential population, and employment areas. Project trip distribution assumptions are shown on Figure 5. Trip assignment was conducted taking into account the multiple approach and departure opportunities provided by the street system, and also taking into account the potential for additional raised medians along portions of Red Hill Avenue.

The new trips to be added to the street system by the Specific Plan development potential were calculated. Project-related traffic volumes are shown on Figure 6.

EXISTING PLUS PROJECT CONDITIONS

Project traffic was added to the Existing traffic volumes. The resulting Existing plus Project traffic volumes are shown on Figure 7.

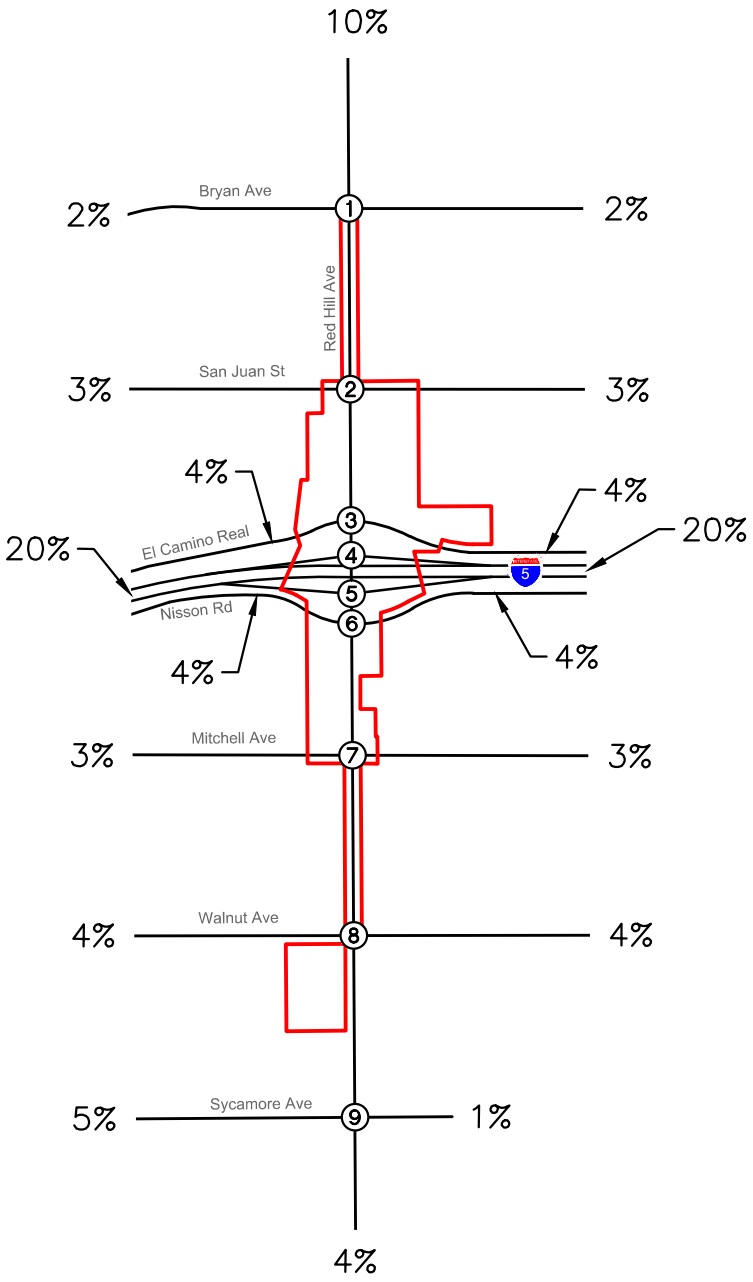
Peak Hour Operating Conditions

The study intersections were analyzed for Existing Plus Project Conditions, and the results are summarized on Table 4. This table shows that all study intersections would continue to operate at an acceptable Level of Service in both peak hours. Copies of the intersection analysis worksheets are provided in *Appendix B* of this report.

Daily Roadway Operating Conditions

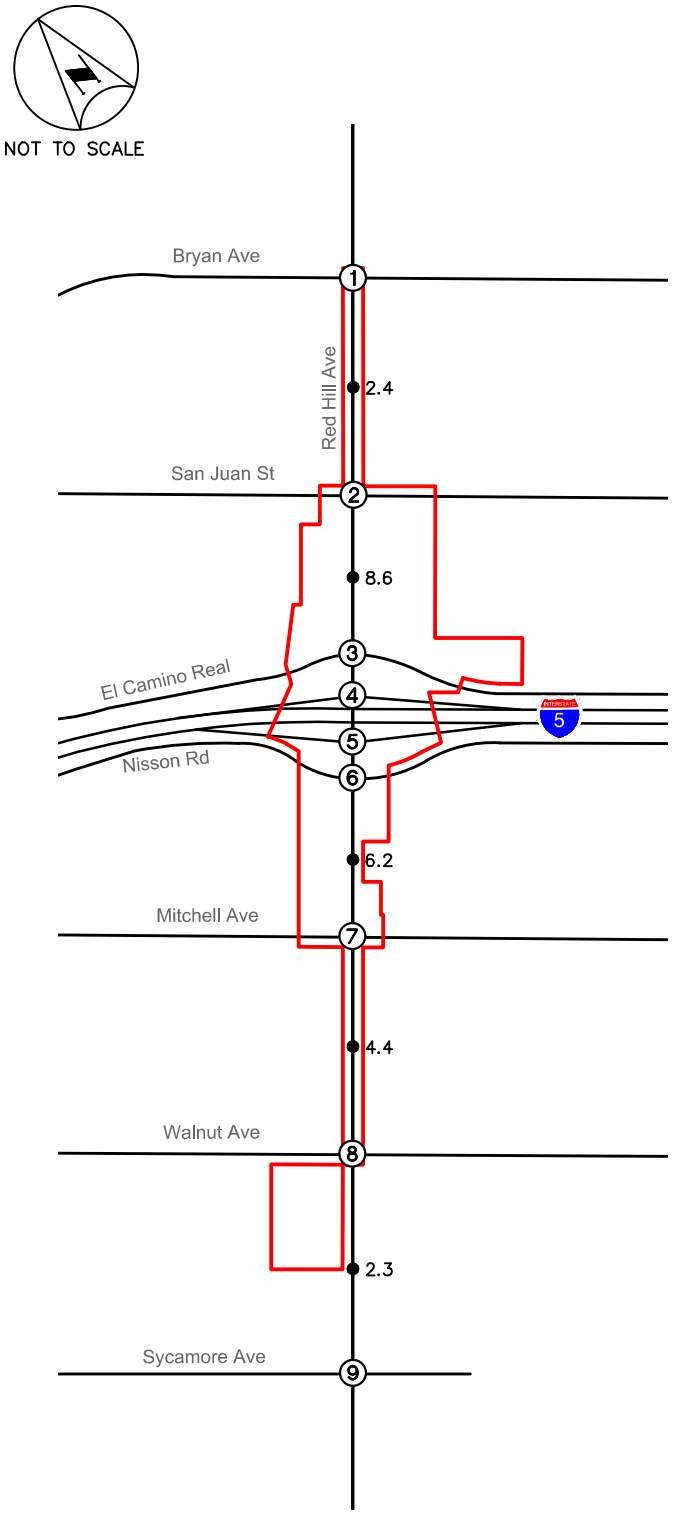
Roadway Level of Service for Existing Plus Project Conditions are shown on Table 5. Review of this table indicates that the study roadway segments would continue to operate within their current Level of Service D capacity.

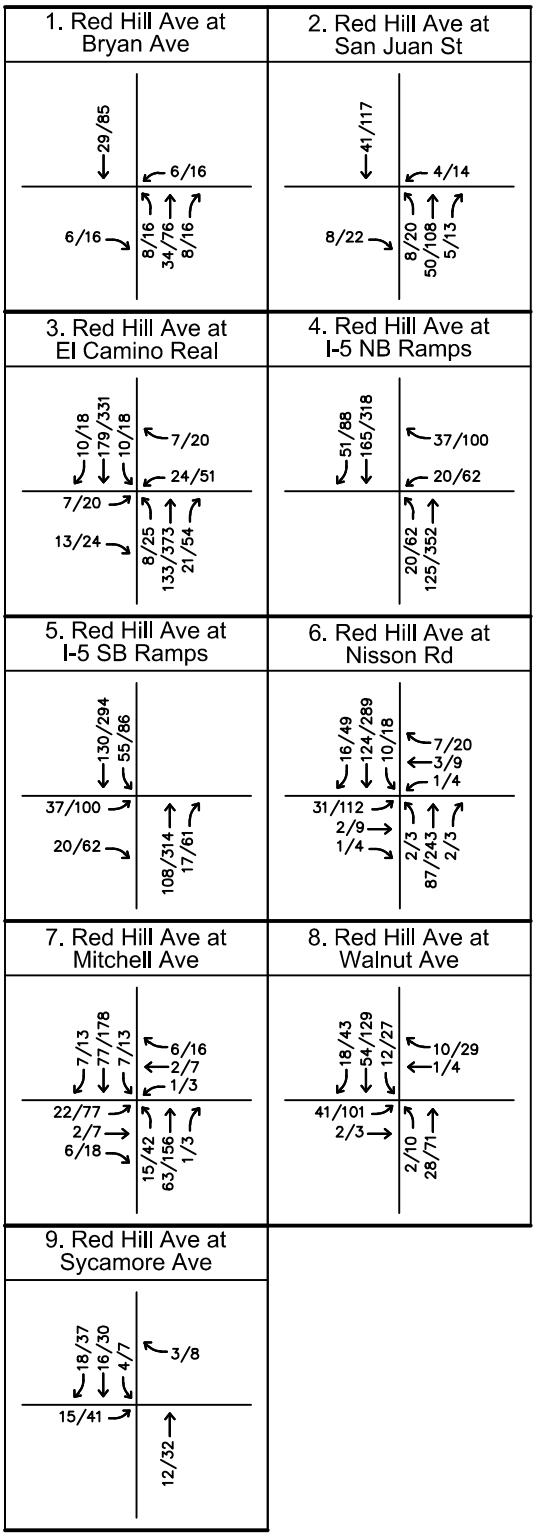
NOT TO SCALE



LEGEND:
- (X) = Study Intersection
- = Specific Plan Boundary
- X% = Distribution Percentage

FIGURE 5
PROJECT TRIP DISTRIBUTION

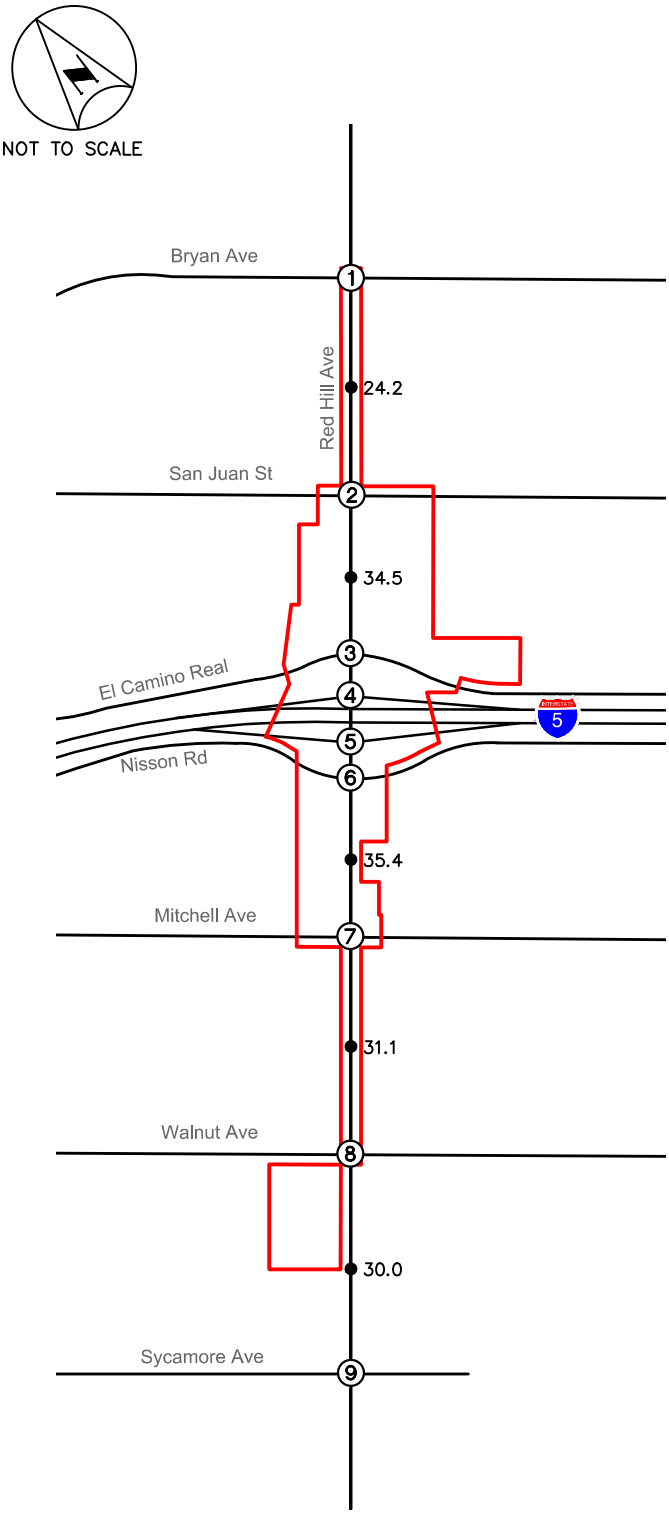


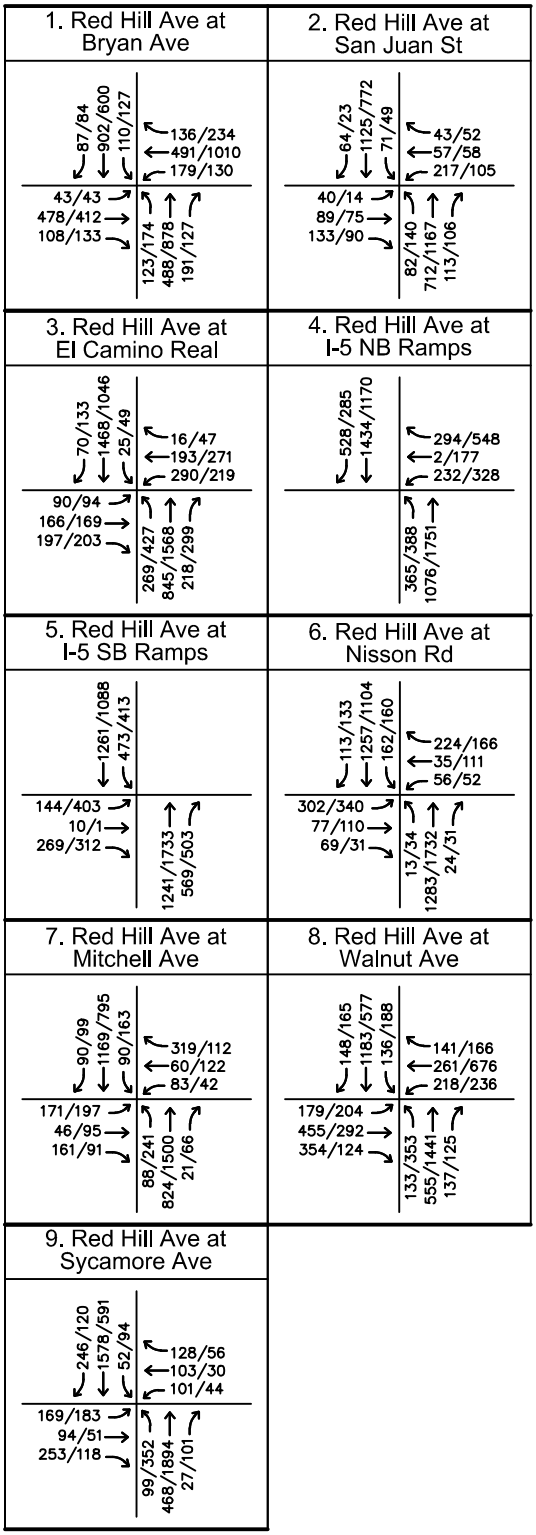


LEGEND:

- (X) = Study Intersection
- = Specific Plan Boundary
- XX/YY = AM/PM Peak Hour Turning Movement Volumes
- ZZ.Z = Average Daily Traffic Volume (1,000's)

FIGURE 6
PROJECT-RELATED TRAFFIC VOLUMES





LEGEND:

- (X) = Study Intersection
- = Specific Plan Boundary
- XX/YY = AM/PM Peak Hour Turning Movement Volumes
- ZZ.Z = Average Daily Traffic Volume (1,000's)

FIGURE 7
EXISTING PLUS PROJECT TRAFFIC VOLUMES

TABLE 4
SUMMARY OF INTERSECTION OPERATION
EXISTING PLUS PROJECT CONDITIONS

Int. #	Intersection	AM Peak Hour						PM Peak Hour					
		Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
		ICU	LOS	ICU	LOS			ICU	LOS	ICU	LOS		
1	Red Hill Avenue at Bryan Avenue	0.65	B	0.67	B	0.02	No	0.75	C	0.77	C	0.02	No
2	Red Hill Avenue at San Juan Street	0.52	A	0.54	A	0.02	No	0.41	A	0.44	A	0.03	No
3	Red Hill Avenue at El Camino Real	0.66	B	0.72	C	0.06	No	0.55	A	0.66	B	0.11	No
4	Red Hill Avenue at I-5 NB Ramps	0.60	A	0.64	B	0.04	No	0.57	A	0.70	B	0.13	No
5	Red Hill Avenue at I-5 SB Ramps	0.68	B	0.75	C	0.07	No	0.68	B	0.83	D	0.15	No
6	Red Hill Avenue at Nisson Road	0.62	B	0.67	B	0.05	No	0.64	B	0.77	C	0.13	No
7	Red Hill Avenue at Mitchell Avenue	0.60	A	0.64	B	0.04	No	0.58	A	0.67	B	0.09	No
8	Red Hill Avenue at Walnut Avenue	0.68	B	0.69	B	0.01	No	0.74	C	0.84	D	0.10	No
9	Red Hill Avenue at Sycamore Ave	0.67	B	0.67	B	0.00	No	0.60	A	0.64	B	0.04	No

HCM Methodology

Int. #	Intersection	AM Peak Hour						PM Peak Hour					
		Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
		Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
4	Red Hill Avenue at I-5 NB Ramps	20.3	B	22.4	B	2.1	No	22.5	C	27.9	C	5.4	No
5	Red Hill Avenue at I-5 SB Ramps	21.6	B	23.9	B	2.3	No	22.4	C	28.4	C	6.0	No

Notes:
- ICU = Intersection Capacity Utilization
- HCM = Highway Capacity Manual
- LOS = Level of Service
- Bold and shaded values indicate intersections operating at LOS E or F per City standards.
- Intersection operation is expressed in terms of volume-to-capacity (V/C) ratio using the ICU methodology.
- Intersection operation is expressed in average seconds of delay (del/veh) ratio for HCM methodology.

TABLE 5
SUMMARY OF ROADWAY ANALYSIS
EXISTING PLUS PROJECT

Roadway	Segment	LOS **D** Capacity	Existing ADT	Daily Project Traffic	Existing + Project Volume	LOS D or Better?
Red Hill Avenue	Bryan Avenue to San Juan Street	50,600	21,800	2,500	24,300	Yes
	San Juan Street to El Camino Real	50,600	25,900	8,800	34,700	Yes
	Nisson Road to Mitchell Avenue	50,600	29,200	6,300	35,500	Yes
	Mitchell Avenue to Walnut Avenue	50,600	26,700	4,500	31,200	Yes
	Walnut Avenue to Sycamore Avenue	50,600	27,700	2,300	30,000	Yes

Notes: LOS = Level of Service
ADT = Average Daily Traffic

LONG-RANGE FUTURE CONDITIONS

Analysis of projected traffic conditions at build-out of the study area was conducted to determine if the build-out transportation system can accommodate the future traffic demands in the study area, including the traffic associated with the Specific Plan development potential. If intersection or roadway segment deficiencies are projected to occur as a result of build-out of the Specific Plan land uses, then improvements needed to accommodate future traffic volumes will be identified.

Traffic Forecasts

The methodology for developing long-range future traffic forecast volumes at the study locations is a multi-step process, based on the following resources and assumptions:

- Traffic forecasts for the Long-Range Future conditions were developed using the Irvine Transportation Analysis Model (ITAM). ITAM is operated and maintained by the City of Irvine, and the ITAM model area covers the Red Hill Specific Plan study area. The ITAM forecast year for long-range future conditions is 2035.

- As a conservative approach, if a turning movement forecast volume produced by this model was less than the existing traffic count for that movement, manual adjustments were made to ensure that all forecast volumes would be equal to or greater than the existing turning movement counts.

- The ITAM model does not contain forecasts for the intersection of Red Hill Avenue at San Juan Street. Forecasts were developed for this intersection by factoring existing traffic counts by the average growth for the two adjacent intersections.

- Roadway segment forecast volumes were developed using the same methodology noted for the peak hour turning movement volumes using ITAM forecasts. If a roadway segment forecast volume produced by this approach was less than the existing traffic count segment, manual adjustments were made to ensure that all forecast volumes would be equal to or greater than the existing segment counts.

- Red Hill Avenue is showing little to no growth or a decrease in daily volumes on most of the study roadway segments. The following are potential reasons for daily traffic reductions on Red Hill Avenue:

    - Traffic may divert from Red Hill Avenue to Newport Avenue due to the planned extension of Newport Avenue to connect with Edinger Avenue on the north leg of the intersection.

    - Traffic may divert from Red Hill Avenue to Browning Avenue due to the planned connection of Browning Avenue over the I-5 Freeway.

- Cumulative Projects in the project vicinity were either included in the ITAM forecasts, or were manually added, if not included.
    - Information for Cumulative Projects that were known at the time this study was undertaken was obtained from the City of Tustin and the City of Irvine.
    - Project information and trip generation assumptions for Cumulative Projects are shown on Table 6. The location of the Cumulative Projects is shown on Figure 8.
    - Trip generation and trip distribution assumptions for the Cumulative Projects were obtained from traffic impact studies, if available, and were developed by Kimley-Horn if traffic studies were not available.
- Project trips for Cumulative Projects that were not already included in the ITAM forecasts were added to the ITAM forecasts.
- The resulting Long-Range Future forecast volumes are shown on Figure 9.

Peak Hour Operating Conditions

The study intersections were analyzed for Long-Range Future conditions, and the results are summarized on Table 7. This table shows that all study intersections are forecasted to operate at an acceptable Level of Service in both peak hours. Copies of the intersection analysis worksheets are provided in *Appendix B* of this report.

Daily Roadway Operating Conditions

Roadway Level of Service analysis results for Long-Range Future Conditions are shown on Table 8. Review of this table indicates that the study roadway segments would operate within their Level of Service D capacity.

TABLE 6
SUMMARY OF CUMULATIVE PROJECTS

PROJECT TRIP GENERATION

Project #	Land Use	Quantity	Units	Trip Generation Estimates						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
City of Santa Ana										
1	The Heritage (Santa Ana)									
	Apartment	1,221	DU	8,120	125	498	623	492	265	757
	General Office Building	56.000	KSF	617	76	10	86	14	69	83
	Shopping Center	12.675	KSF	544	8	5	13	23	24	47
	High-Turnover (Sit-Down) Restaurant	5.415	KSF	689	32	30	62	36	25	61
	Internal Capture (5%)			-499	-12	-27	-39	-28	-19	-47
City of Tustin										
2	Tustin Legacy Specific Plan [1]			32,696	580	1,393	1,973	1,909	1,187	3,096
3	Downtown Core Specific Plan [2]			8,496	N/A	N/A	660	N/A	N/A	719
City of Irvine										
4	Kilroy Apartments	469	DU	3,119	48	191	239	189	102	291
5	17861 Cartwright	45	DU	261	3	16	19	16	8	24
6	16542 Millikan	213	DU	1,238	16	78	94	74	37	111
7	17811-17817 Gillette Ave	44	DU	256	3	16	19	15	8	23
8	2152 Alton Apartments	357	DU	2,374	36	146	182	144	77	221
9	Boardwalk	458.000	KSF	5,043	625	85	710	116	566	682
10	Parcel 3 / Diamond Jamboree Retail	25.000	KSF	1,074	15	10	25	46	48	94
11	17850 Von Karman Office	242.497	KSF	2,670	331	45	376	61	300	361
12	17451 Von Karman Ave									
	Condominium	115	DU	668	9	42	51	40	20	60
	General Office Building	2.300	KSF	25	3	0	3	1	3	4
13	17832-17840 Gillette	326	DU	1,894	24	119	143	114	56	170
14	2525 Main Apartments Phase III	146	DU	848	11	53	64	51	25	76
Total Project Trips				70,134	1,933	2,710	4,643	3,313	2,801	6,114

DU = Dwelling Units, KSF = 1,000 square feet

[1] Mixed-Use Community

[2] Source: Tustin Downtown Commercial Core Specific Plan Traffic Study (June 2017)

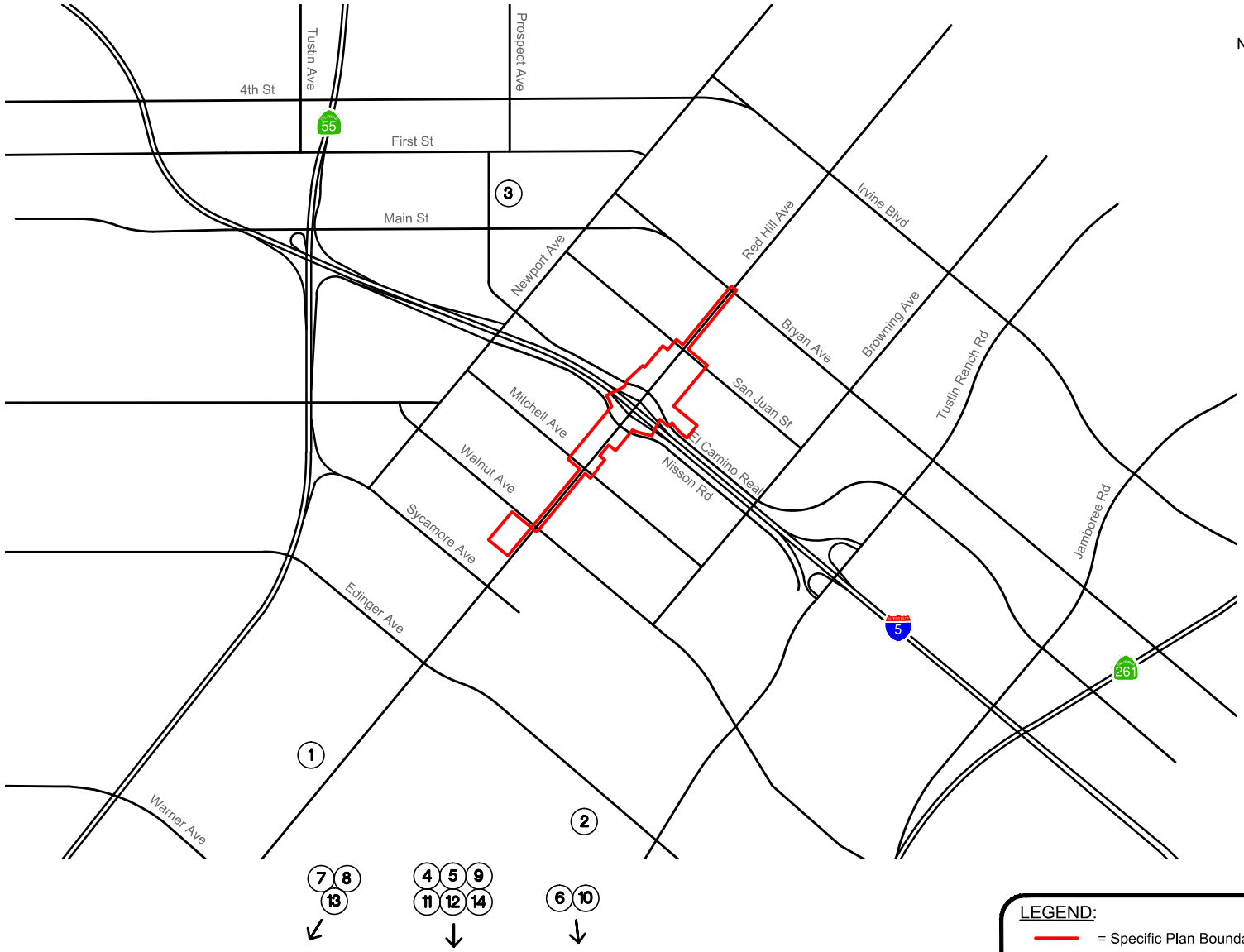
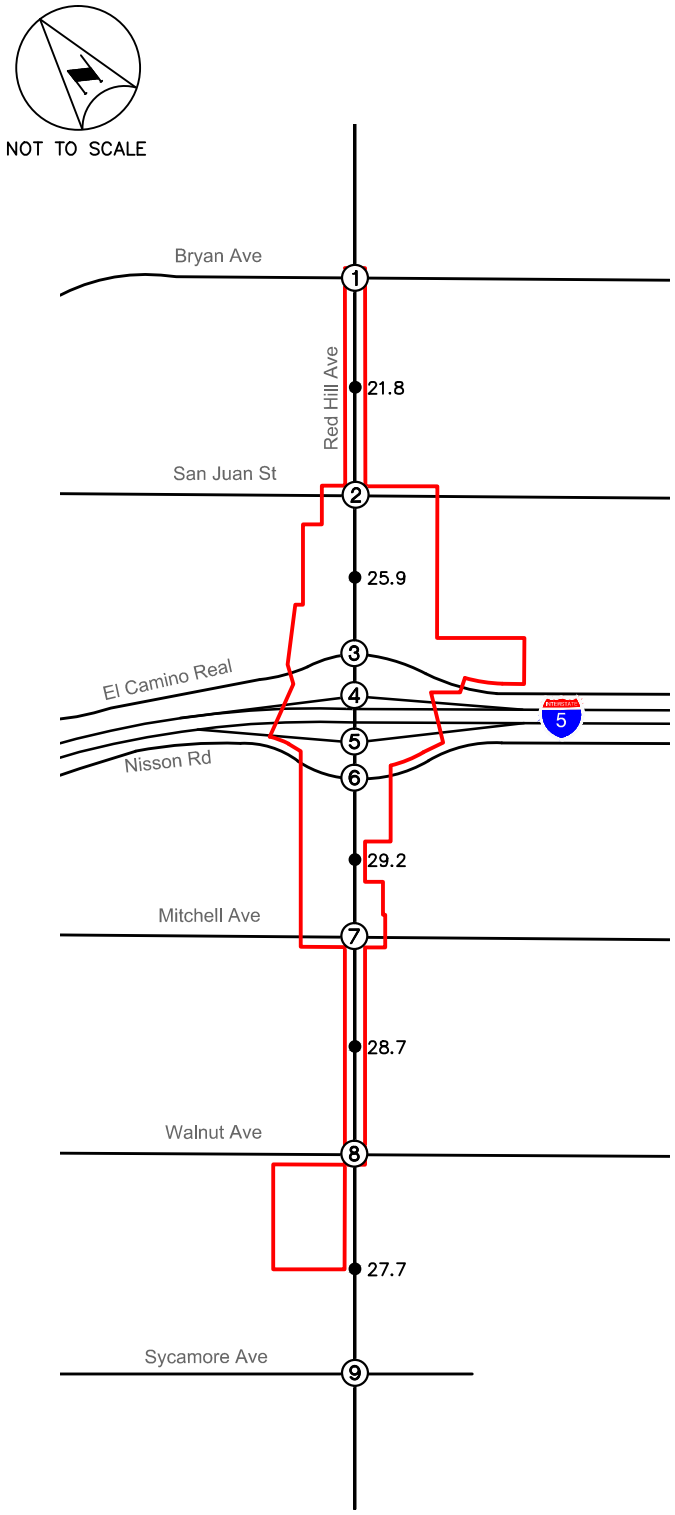
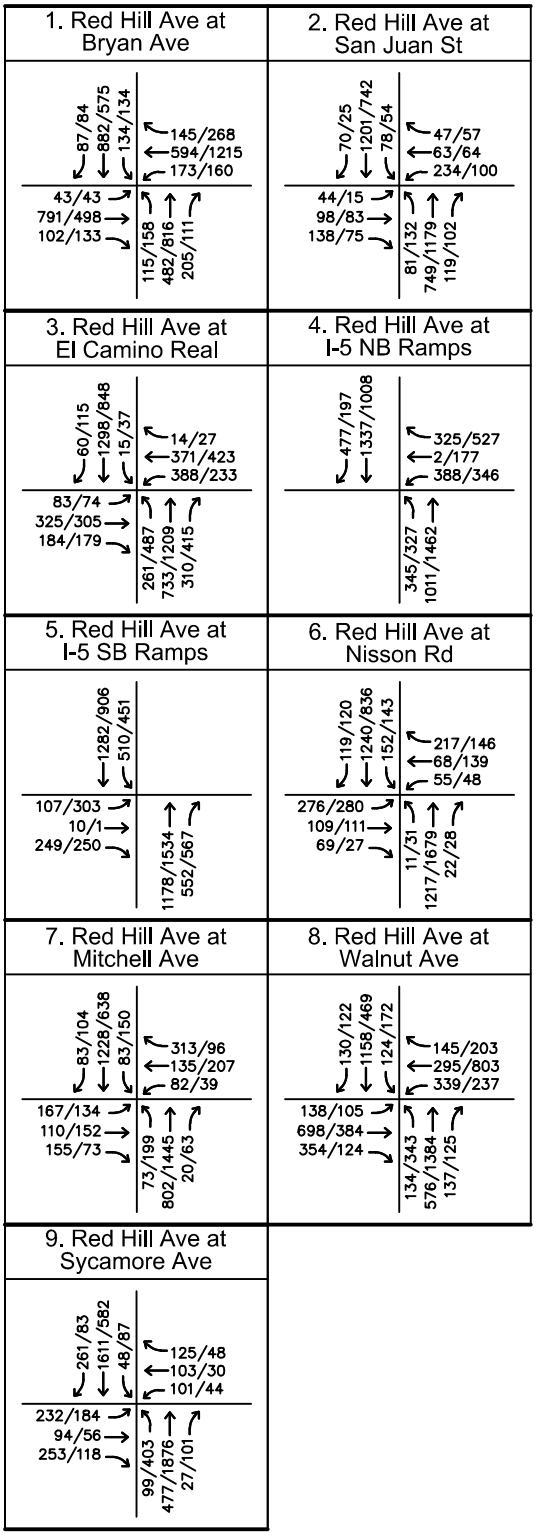


FIGURE 8
LOCATION OF CUMULATIVE PROJECTS

K:\ORA_TPTO\ZSAC\Projects\Projects for Others\Allen\Allen – Active\Redhill Corridor\6 CADD\FIGURES–Tustin Red Hill SP.dwg

Kimley»Horn





LEGEND:

- (X) = Study Intersection
- = Specific Plan Boundary
- XX/YY = AM/PM Peak Hour Turning Movement Volumes
- ZZ.Z = Average Daily Traffic Volume (1,000's)

FIGURE 9
LONG-RANGE FUTURE TRAFFIC VOLUMES

TABLE 7
SUMMARY OF INTERSECTION OPERATION
LONG-RANGE FUTURE CONDITIONS

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			ICU	LOS	ICU	LOS
1	Red Hill Avenue at Bryan Avenue	S	0.74	C	0.83	D
2	Red Hill Avenue at San Juan Street	S	0.57	A	0.45	A
3	Red Hill Avenue at El Camino Real	S	0.81	D	0.70	B
4	Red Hill Avenue at I-5 NB Ramps	S	0.65	B	0.64	B
5	Red Hill Avenue at I-5 SB Ramps	S	0.74	C	0.83	D
6	Red Hill Avenue at Nisson Road	S	0.65	B	0.72	C
7	Red Hill Avenue at Mitchell Avenue	S	0.63	B	0.66	B
8	Red Hill Avenue at Walnut Avenue	S	0.79	C	0.81	D
9	Red Hill Avenue at Sycamore Ave	S	0.69	B	0.63	B

HCM Methodology

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
4	Red Hill Avenue at I-5 NB Ramps	S	23.4	B	25.1	C
5	Red Hill Avenue at I-5 SB Ramps	S	24.2	B	25.8	C

Notes:
- S = Signalized
- ICU = Intersection Capacity Utilization
- HCM = Highway Capacity Manual
- LOS = Level of Service
- Bold and shaded values indicate intersections operating at LOS E or F per City standards.
- Intersection operation is expressed in terms of volume-to-capacity (V/C) ratio using the ICU methodology.
- Intersection operation is expressed in average seconds of delay (del/veh) ratio for HCM methodology.

TABLE 8
SUMMARY OF ROADWAY ANALYSIS
LONG-RANGE FUTURE

Roadway	Segment	LOS **D** Capacity	Long-Range Future ADT	LOS D or Better?
Red Hill Avenue	Bryan Avenue to San Juan Street	50,600	21,800	Yes
	San Juan Street to El Camino Real	50,600	25,900	Yes
	Nisson Road to Mitchell Avenue	50,600	29,200	Yes
	Mitchell Avenue to Walnut Avenue	50,600	28,700	Yes
	Walnut Avenue to Sycamore Avenue	50,600	27,700	Yes

Notes: LOS = Level of Service
ADT = Average Daily Traffic

LONG-RANGE FUTURE WITH PROJECT CONDITIONS

Traffic Forecasts

The project trips from the Red Hill Avenue Specific Plan, were added to the traffic forecasts for Long-Range Future Conditions, to develop Long-Range Future with Project traffic forecasts. The Long-Range Future with Project peak hour forecast volumes are shown on Figure 10.

Peak Hour Operating Conditions

The study intersections were analyzed for Long-Range Future With Project conditions, and the results are summarized on Table 9. This table shows that all study intersections would continue to operate at an acceptable Level of Service in both peak hours, except for the following:

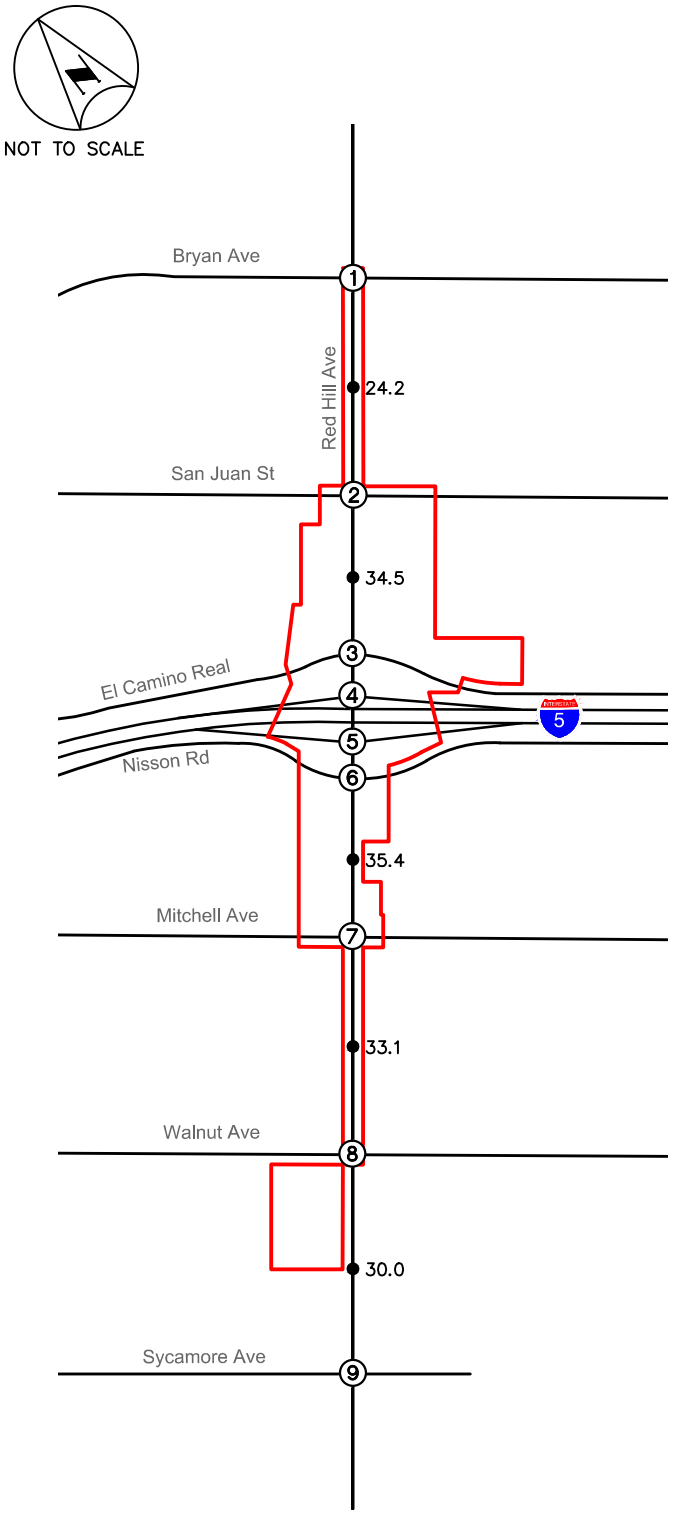
- #5 – Red Hill Avenue at I-5 SB Ramps: PM – LOS E

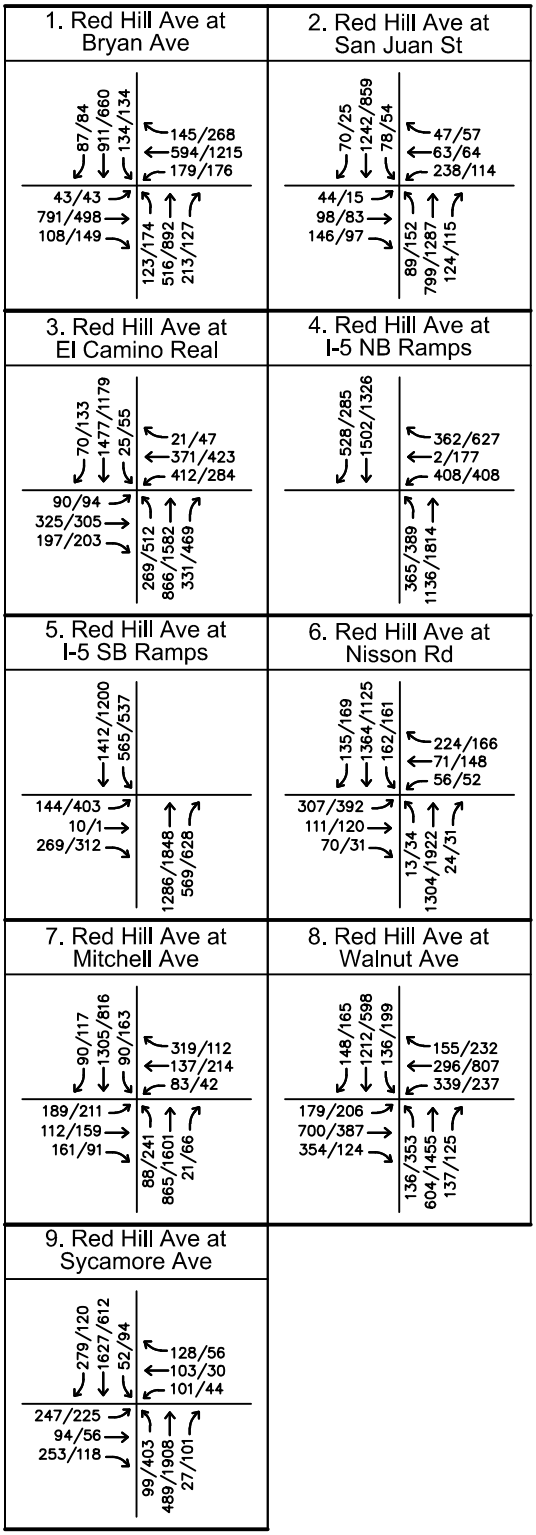
The addition of project traffic will cause the intersection to worsen to LOS E in the evening peak hour based on the City's ICU methodology. The Level of Service would still be LOS C during both peak hours using the Caltrans HCM methodology. The project's impact using the ICU methodology would be considered to be a significant impact, and improvements to mitigate the project's impact will be identified.

Copies of the intersection analysis worksheets are provided in *Appendix B* of this report.

Daily Roadway Operating Conditions

The results of the roadway analysis for Long-Range Future With Project Conditions are shown on Table 10. Review of this table indicates that, with the addition of project traffic, the study roadway segments would continue to operate within their Level of Service D capacity.





LEGEND:

- (X) = Study Intersection
- = Specific Plan Boundary
- XX/YY = AM/PM Peak Hour Turning Movement Volumes
- ZZ.Z = Average Daily Traffic Volume (1,000's)

FIGURE 10
LONG-RANGE FUTURE WITH PROJECT TRAFFIC VOLUMES

TABLE 9
SUMMARY OF INTERSECTION OPERATION
LONG-RANGE FUTURE WITH PROJECT CONDITIONS

Int. #	Intersection	AM Peak Hour						PM Peak Hour					
		Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
		ICU	LOS	ICU	LOS			ICU	LOS	ICU	LOS		
1	Red Hill Avenue at Bryan Avenue	0.74	C	0.76	C	0.02	No	0.83	D	0.85	D	0.02	No
2	Red Hill Avenue at San Juan Street	0.57	A	0.59	A	0.02	No	0.45	A	0.48	A	0.03	No
3	Red Hill Avenue at El Camino Real	0.81	D	0.87	D	0.06	No	0.70	B	0.80	C	0.10	No
4	Red Hill Avenue at I-5 NB Ramps	0.65	B	0.70	B	0.05	No	0.64	B	0.66	B	0.02	No
5	Red Hill Avenue at I-5 SB Ramps	0.74	C	0.80	C	0.06	No	0.83	D	0.97	E	0.14	Yes
6	Red Hill Avenue at Nisson Road	0.65	B	0.70	B	0.05	No	0.72	C	0.85	D	0.13	No
7	Red Hill Avenue at Mitchell Avenue	0.63	B	0.67	B	0.04	No	0.66	B	0.75	C	0.09	No
8	Red Hill Avenue at Walnut Avenue	0.79	C	0.81	D	0.02	No	0.81	D	0.90	D	0.09	No
9	Red Hill Avenue at Sycamore Ave	0.69	B	0.70	B	0.01	No	0.63	B	0.67	B	0.04	No

HCM Methodology

Int. #	Intersection	AM Peak Hour						PM Peak Hour					
		Without Project		With Project		Project	Impact	Without Project		With Project		Project	Impact
		Delay	LOS	Delay	LOS	Impact	Sig?	Delay	LOS	Delay	LOS	Impact	Sig?
4	Red Hill Avenue at I-5 NB Ramps	23.4	B	25.9	B	2.5	No	25.1	C	34.2	C	9.1	No
5	Red Hill Avenue at I-5 SB Ramps	24.2	B	29.4	B	5.2	No	25.8	C	34.7	C	8.9	No

Notes:
- ICU = Intersection Capacity Utilization
- HCM = Highway Capacity Manual
- LOS = Level of Service
- Bold and shaded values indicate intersections operating at LOS E or F per City standards.
- Intersection operation is expressed in terms of volume-to-capacity (V/C) ratio using the ICU methodology.
- Intersection operation is expressed in average seconds of delay (del/veh) ratio for HCM methodology.

TABLE 10
SUMMARY OF ROADWAY ANALYSIS
LONG-RANGE FUTURE WITH PROJECT

Roadway	Segment	LOS D Capacity	Long-Range Future ADT	Daily Project Traffic	Long-Range Future + Project Volume	LOS D or Better?
Red Hill Avenue	Bryan Avenue to San Juan Street	50,600	21,800	2,500	24,300	Yes
	San Juan Street to El Camino Real	50,600	25,900	8,800	34,700	Yes
	Nisson Road to Mitchell Avenue	50,600	29,200	6,300	35,500	Yes
	Mitchell Avenue to Walnut Avenue	50,600	28,700	4,500	33,200	Yes
	Walnut Avenue to Sycamore Avenue	50,600	27,700	2,300	30,000	Yes

Notes: LOS = Level of Service
ADT = Average Daily Traffic

SUMMARY OF NEEDED IMPROVEMENTS

Improvements were identified that would achieve improved Level of Service under Long-Range Future conditions for intersection #5 – Red Hill Avenue at I-5 SB Ramps.

- #5 – Red Hill Avenue at I-5 SB Ramps: Re-stripe the eastbound approach (the off-ramp) to convert from one shared left-through lane and one dedicated right-turn lane to one dedicated left-turn lane and a shared left-through-right lane. This improvement would provide additional capacity for the heavy eastbound left-turn volume. With this improvement, the intersection would operate at LOS D or better during both peak hours. Note that Caltrans' review and approval would be needed to implement this improvement.

A summary of the intersection operation before and after implementation of these improvements is provided on Table 11.

It should be noted that traffic volumes associated with the Specific Plan will increase gradually over time, and as such, implementing intersection improvements would not be an immediate action the City would need to take. Similarly, the potential for a traffic signal on Red Hill Avenue north of the I-5 Freeway (as shown on the Circulation Plan of the Specific Plan) would be evaluated and implemented only if warranted as development occurs, based upon a warrant analysis performed in conjunction with project-specific traffic analysis. Traffic growth at the study intersections should be monitored as project-specific development occurs, and the recommended improvements implemented when determined to be needed.

A funding or fee assessment mechanism, such as a traffic impact fee, or an improvement district, could be implemented to collect a portion of the costs to implement these improvements from new development. To the extent that future development within the Specific Plan area contributes to the need for improvements, a fair-share contribution to the cost of the improvements can be made a condition of approval for that development.

TABLE 11
SUMMARY OF INTERSECTION OPERATIONS
LONG-RANGE FUTURE WITH PROJECT MITIGATION

		AM Peak Hour				PM Peak Hour			
		Without Improvement		With Improvement		Without Improvement		With Improvement	
Int. #	Intersection	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
5	Red Hill Avenue at I-5 SB Ramps								
	Re-stripe EB approach to be one dedicated left-turn lane and one shared left-through-right lane	0.80	C	0.76	C	0.97	E	0.85	D

Notes:
- ICU = Intersection Capacity Utilization
- LOS = Level of Service
- Bold and shaded values indicate intersections operating at LOS E or F per City standards.
- Intersection operation is expressed in terms of volume-to-capacity (V/C) ratio using the ICU methodology.

SUMMARY OF FINDINGS AND CONCLUSIONS

- The Red Hill Avenue Specific Plan project is located along Red Hill Avenue, generally between Bryan Avenue to the north, and Walnut Avenue to the south.

- The Specific Plan project consists of implementation of new development densities and standards, which will allow the potential for development of additional retail, restaurant, and residential development along Red Hill Avenue. Streetscape improvements, including the addition of raised medians along some roadway segments, are also proposed.

- The project is forecasted to generate approximately 17,836 trips per day, with 641 trips in the morning peak hour, and 1,562 trips in the evening peak hour.

- Under the Existing and Existing Plus Project conditions, all study intersections would operate at an acceptable Level of Service in both peak hours.

- Under Long-Range Future conditions, all study intersections would continue to operate at an acceptable Level of Service in both peak hours.

- Under Long-Range Future with Project conditions, all study intersections would continue to operate at an acceptable Level of Service in both peak hours, except for the following intersection using the City's ICU methodology:

    - #5 – Red Hill Avenue at I-5 SB Ramps: PM – LOS E

- Improvements were identified that would achieve improved Level of Service under Long-Range Future conditions at this intersection.

- Under all study conditions, all study roadway segments would operate within their Level of Service D capacity.

- Traffic volumes associated with the Specific Plan will increase gradually over time, such that implementing intersection improvements would not be an immediate action the City would need to take. Traffic growth should be monitored, and the needed improvements implemented when determined to be needed.

- A funding or fee assessment mechanism, such as a traffic impact fee, or an improvement district, could be implemented to collect a portion of the costs to implement these improvements from new development.

- To the extent that future development contributes to the need for improvements, a fair-share contribution to the cost of the improvements can be made a condition of approval for that development.

APPENDIX **A**

TRAFFIC COUNT WORKSHEETS

ITM Peak Hour Summary

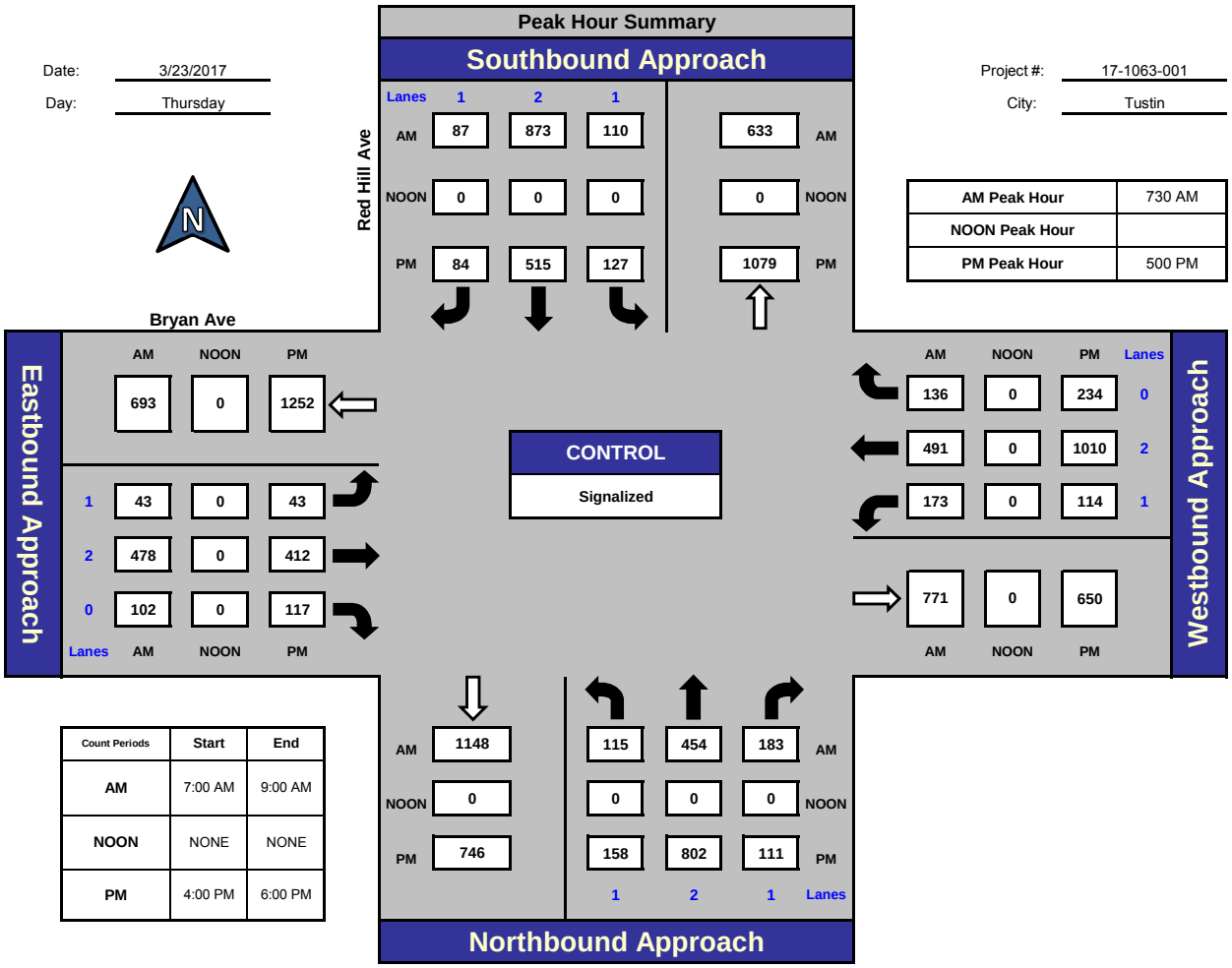
Prepared by:

National Data & Surveying Services

Red Hill Ave and Bryan Ave , Tustin

Date: 3/23/2017
Day: Thursday

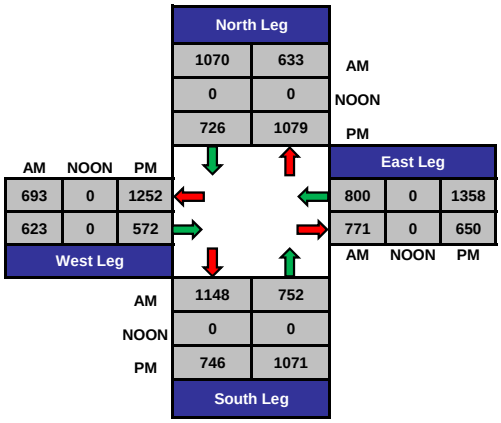
Project #: 17-1063-001
City: Tustin



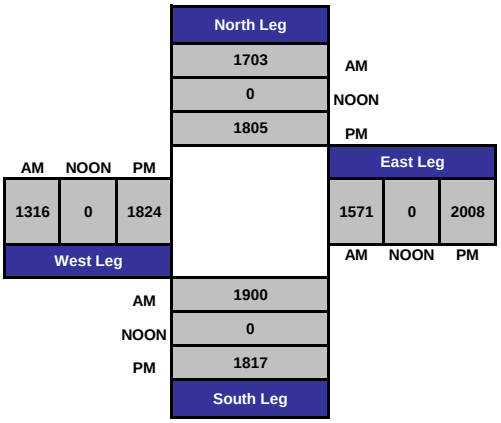
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-001

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	19	77	15	13	146	7	2	82	26	20	49	6	462
7:15 AM	13	78	33	26	204	12	3	114	26	33	80	14	636
7:30 AM	29	88	82	33	213	16	16	145	31	55	123	30	861
7:45 AM	27	116	51	31	196	22	8	156	25	47	160	45	884
8:00 AM	37	145	28	16	227	27	12	93	18	35	105	32	775
8:15 AM	22	105	22	30	237	22	7	84	28	36	103	29	725
8:30 AM	36	74	17	32	177	23	10	76	23	37	86	19	610
8:45 AM	20	102	12	15	174	15	5	64	18	26	83	16	550
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	203	785	260	196	1574	144	63	814	195	289	789	191	5503
APPROACH %'s :	16.27%	62.90%	20.83%	10.24%	82.24%	7.52%	5.88%	75.93%	18.19%	22.77%	62.17%	15.05%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	115	454	183	110	873	87	43	478	102	173	491	136	3245
PEAK HR FACTOR :		0.895			0.926			0.811			0.794		0.918

UTURNS

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-001

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	0	1	2	0	
4:00 PM	40	199	22	29	121	23	5	92	19	29	231	48	858
4:15 PM	40	190	25	25	96	15	13	85	26	27	260	60	862
4:30 PM	37	201	25	43	134	16	8	104	26	15	227	59	895
4:45 PM	38	212	25	29	105	21	13	83	24	34	259	54	897
5:00 PM	39	177	24	42	150	17	10	115	31	20	215	74	914
5:15 PM	48	179	25	28	124	20	10	108	22	31	293	55	943
5:30 PM	33	222	27	29	120	23	9	97	43	31	245	47	926
5:45 PM	38	224	35	28	121	24	14	92	21	32	257	58	944
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	313	1604	208	253	971	159	82	776	212	219	1987	455	7239
APPROACH %'s :	14.73%	75.48%	9.79%	18.29%	70.21%	11.50%	7.66%	72.52%	19.81%	8.23%	74.67%	17.10%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	158	802	111	127	515	84	43	412	117	114	1010	234	3727
PEAK HR FACTOR :		0.902			0.868			0.917			0.896		0.987

UTURNS

NB	SB	EB	WB
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

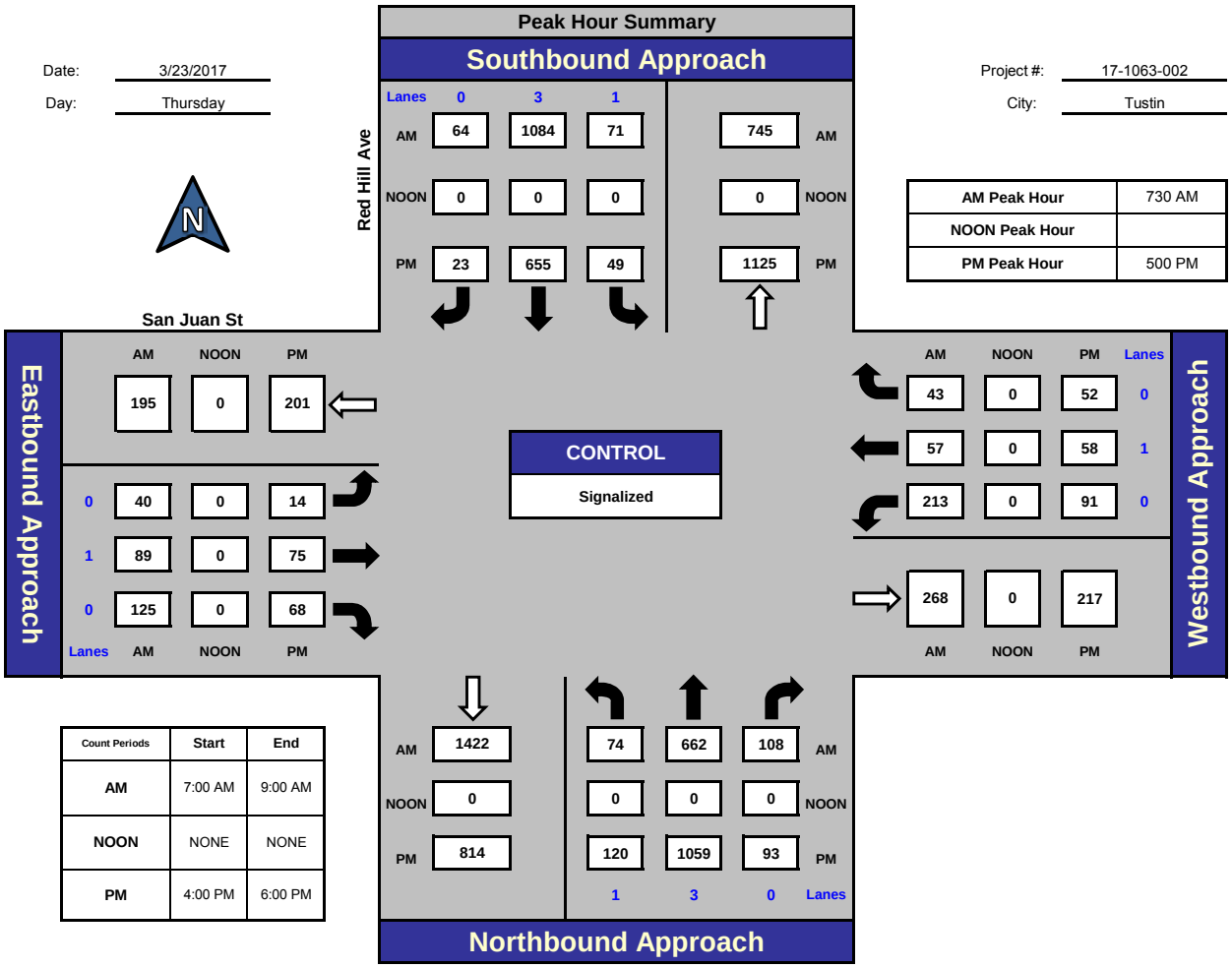
Prepared by:

National Data & Surveying Services

Red Hill Ave and San Juan St , Tustin

Date: 3/23/2017
Day: Thursday

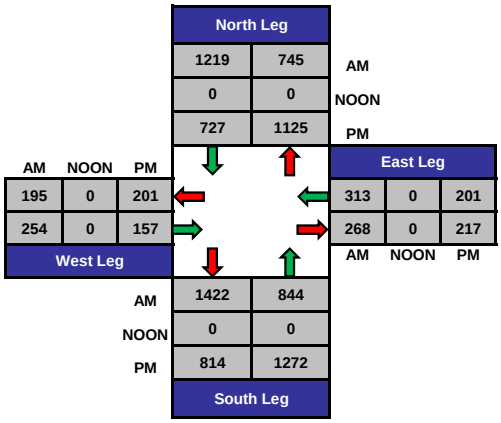
Project #: 17-1063-002
City: Tustin



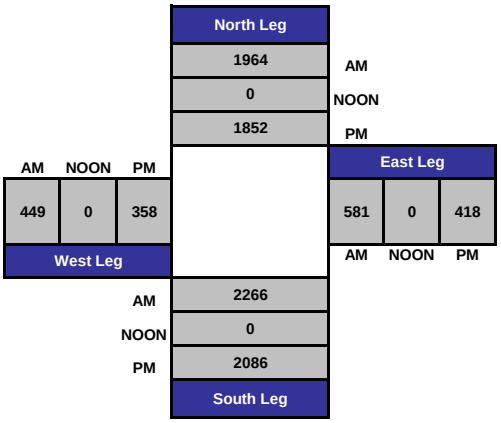
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-002

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	1	0	0	1	0	
7:00 AM	5	99	15	5	184	6	3	3	26	27	7	6	386
7:15 AM	9	115	19	13	234	13	9	12	29	52	10	4	519
7:30 AM	32	165	35	18	276	25	14	33	46	60	20	11	735
7:45 AM	16	171	40	19	266	19	17	39	30	55	17	13	702
8:00 AM	12	189	17	16	246	10	6	10	27	62	15	13	623
8:15 AM	14	137	16	18	296	10	3	7	22	36	5	6	570
8:30 AM	13	129	8	8	231	6	3	6	21	38	5	3	471
8:45 AM	18	126	6	9	206	5	2	3	10	28	4	5	422
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	119	1131	156	106	1939	94	57	113	211	358	83	61	4428
APPROACH %'s :	8.46%	80.44%	11.10%	4.96%	90.65%	4.39%	14.96%	29.66%	55.38%	71.31%	16.53%	12.15%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	74	662	108	71	1084	64	40	89	125	213	57	43	2630
PEAK HR FACTOR :		0.909			0.941			0.683			0.860		0.895

UTURNS				
	NB	SB	EB	WB
	1	0	0	0
	1	0	0	0
	2	0	0	0
	1	0	0	0
	1	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	NB	SB	EB	WB
	6	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-002

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	1	0	0	1	0	
4:00 PM	28	250	14	10	155	5	2	5	7	19	14	5	514
4:15 PM	21	256	16	8	128	9	2	8	12	14	19	8	501
4:30 PM	24	258	18	8	155	3	2	14	11	24	11	10	538
4:45 PM	28	265	22	10	155	6	3	14	22	19	13	10	567
5:00 PM	30	251	24	12	181	4	1	18	15	23	10	8	577
5:15 PM	25	240	26	14	158	4	3	13	19	26	14	17	559
5:30 PM	31	301	19	13	166	9	3	16	14	18	15	12	617
5:45 PM	34	267	24	10	150	6	7	28	20	24	19	15	604
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	221	2088	163	85	1248	46	23	116	120	167	115	85	4477
APPROACH %'s :	8.94%	84.47%	6.59%	6.16%	90.50%	3.34%	8.88%	44.79%	46.33%	45.50%	31.34%	23.16%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	120	1059	93	49	655	23	14	75	68	91	58	52	2357
PEAK HR FACTOR :		0.906			0.923			0.714			0.866		0.955

UTURNS	NB	SB	EB	WB
	0	0	0	0
	3	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	1	0	0	0
	1	0	0	0
	1	1	0	0
	3	0	0	0
	NB	SB	EB	WB
	9	1	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

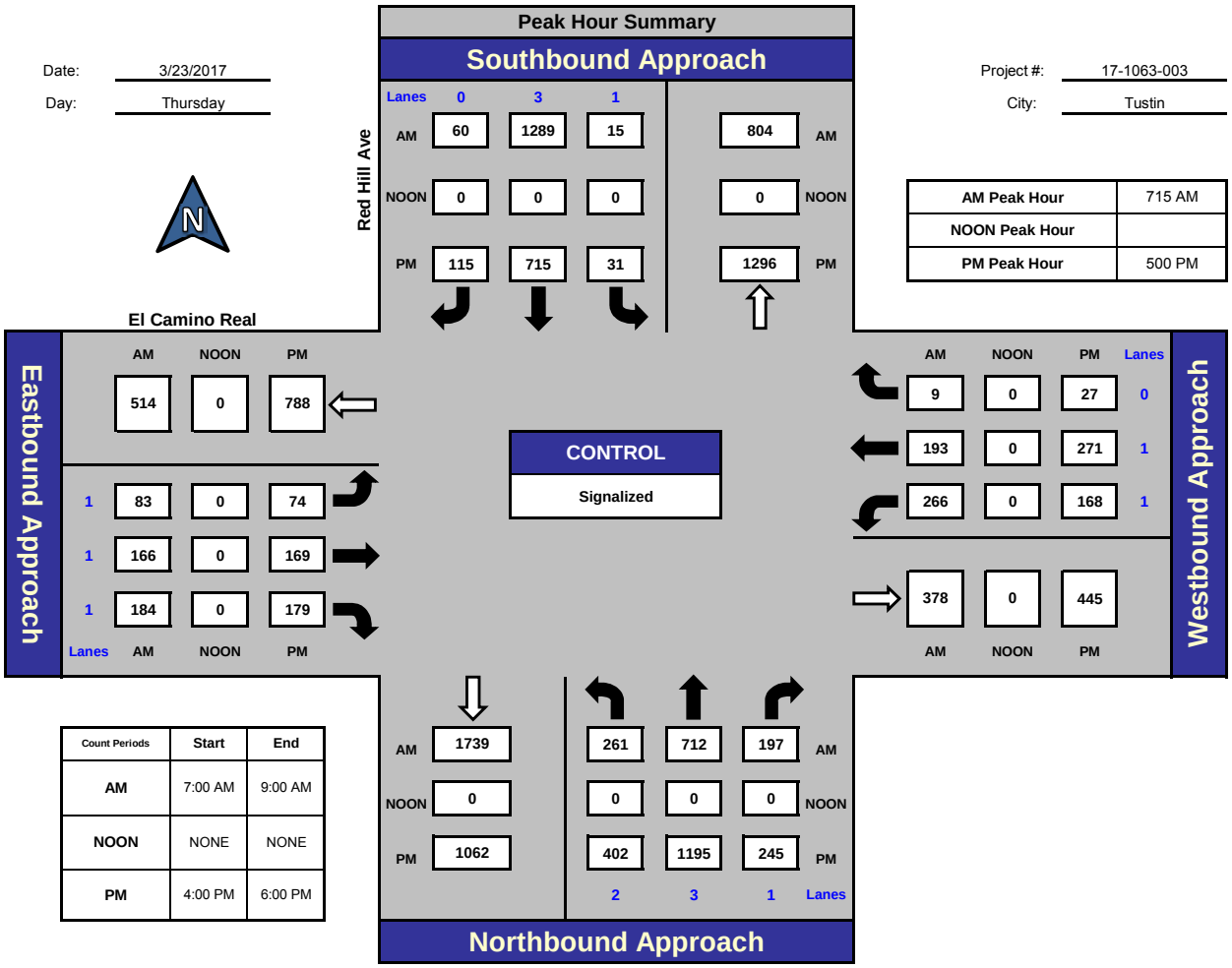
National Data & Surveying Services

Red Hill Ave and El Camino Real , Tustin

Date: 3/23/2017
Day: Thursday

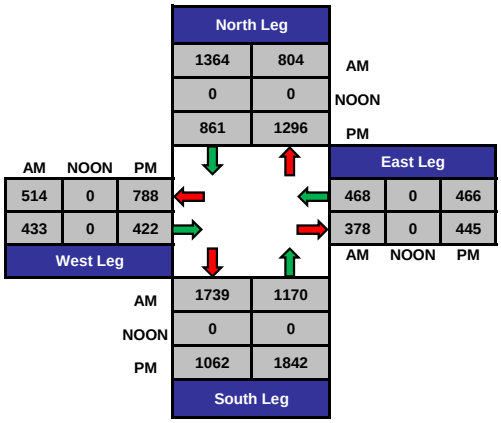
Project #: 17-1063-003
City: Tustin

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

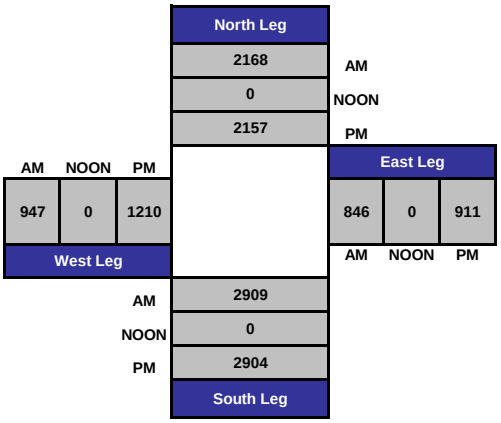


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-003

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	3	1	1	3	0	1	1	1	1	1	0	
7:00 AM	45	129	23	0	215	13	9	27	37	48	12	3	561
7:15 AM	72	146	40	5	298	11	13	39	44	67	42	1	778
7:30 AM	106	204	78	2	302	24	33	53	47	72	67	3	991
7:45 AM	40	176	60	5	348	19	27	42	42	61	59	2	881
8:00 AM	43	186	19	3	341	6	10	32	51	66	25	3	785
8:15 AM	49	155	16	4	347	18	6	31	47	55	29	1	758
8:30 AM	55	156	23	2	291	16	6	23	42	49	30	4	697
8:45 AM	54	159	24	2	249	6	5	28	36	32	23	3	621
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	464	1311	283	23	2391	113	109	275	346	450	287	20	6072
APPROACH %'s :	22.55%	63.70%	13.75%	0.91%	94.62%	4.47%	14.93%	37.67%	47.40%	59.45%	37.91%	2.64%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	261	712	197	15	1289	60	83	166	184	266	193	9	3435
PEAK HR FACTOR :		0.754			0.917			0.814			0.824		0.867

UTURNS	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	NB	SB	EB	WB
	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-003

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	3	1	1	3	0	1	1	1	1	1	0	
4:00 PM	89	273	46	4	158	17	22	25	55	52	67	4	812
4:15 PM	83	278	66	10	147	23	13	38	57	69	87	6	877
4:30 PM	91	295	60	9	174	18	14	34	36	45	77	7	860
4:45 PM	82	292	55	7	167	26	15	29	47	36	82	3	841
5:00 PM	73	285	60	7	186	24	14	33	47	38	65	9	841
5:15 PM	112	266	68	5	175	38	18	50	36	44	69	8	889
5:30 PM	103	333	54	9	176	24	28	40	46	45	69	3	930
5:45 PM	114	311	63	10	178	29	14	46	50	41	68	7	931
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	747	2333	472	61	1361	199	138	295	374	370	584	47	6981
APPROACH %'s :	21.03%	65.68%	13.29%	3.76%	83.96%	12.28%	17.10%	36.56%	46.34%	36.96%	58.34%	4.70%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	402	1195	245	31	715	115	74	169	179	168	271	27	3591
PEAK HR FACTOR :		0.940			0.987			0.925			0.963		0.964

UTURNS	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	1	0	0
	0	0	0	0
	NB	SB	EB	WB
	0	1	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

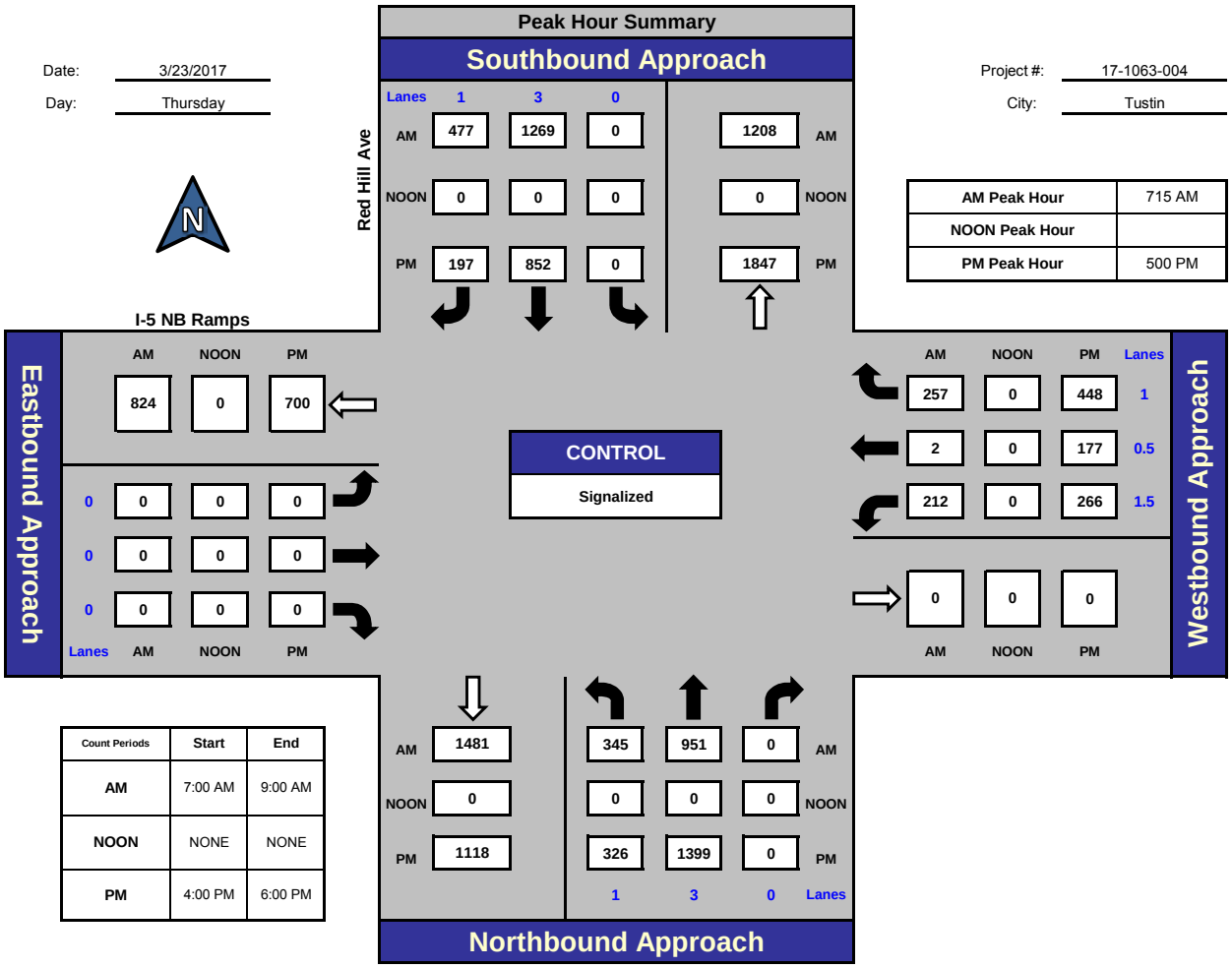
National Data & Surveying Services

Red Hill Ave and I-5 NB Ramps , Tustin

Date: 3/23/2017
Day: Thursday

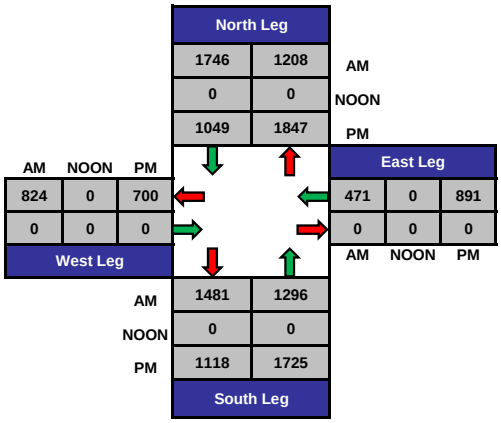
Project #: 17-1063-004
City: Tustin

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

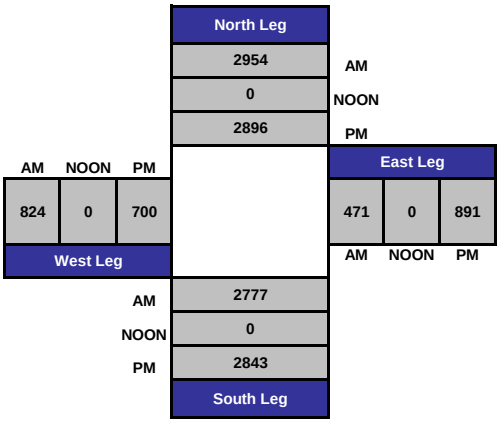


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-004

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	0	3	1	0	0	0	1.5	0.5	1	
7:00 AM	73	113	0	0	202	95	0	0	0	60	2	68	613
7:15 AM	75	201	0	0	277	140	0	0	0	52	1	57	803
7:30 AM	90	337	0	0	300	112	0	0	0	60	0	62	961
7:45 AM	96	240	0	0	351	109	0	0	0	55	0	50	901
8:00 AM	84	173	0	0	341	116	0	0	0	45	1	88	848
8:15 AM	73	148	0	0	339	112	0	0	0	55	4	61	792
8:30 AM	66	142	0	0	281	101	0	0	0	56	2	94	742
8:45 AM	58	149	0	0	226	85	0	0	0	58	1	84	661
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	615	1503	0	0	2317	870	0	0	0	441	11	564	6321
APPROACH %'s :	29.04%	70.96%	0.00%	0.00%	72.70%	27.30%	#DIV/0!	#DIV/0!	#DIV/0!	43.41%	1.08%	55.51%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	345	951	0	0	1269	477	0	0	0	212	2	257	3513
PEAK HR FACTOR :		0.759			0.949			0.000			0.879		0.914

UTURNS				
NB	SB	EB	WB	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
NB	SB	EB	WB	
0	0	0	0	

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-004

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	0	3	1	0	0	0	1.5	0.5	1	
4:00 PM	61	337	0	0	216	56	0	0	0	34	24	66	794
4:15 PM	88	365	0	0	229	44	0	0	0	57	33	65	881
4:30 PM	82	358	0	0	206	46	0	0	0	45	35	71	843
4:45 PM	74	334	0	0	216	44	0	0	0	50	41	98	857
5:00 PM	55	329	0	0	203	57	0	0	0	67	44	84	839
5:15 PM	104	344	0	0	204	57	0	0	0	59	39	113	920
5:30 PM	74	362	0	0	228	41	0	0	0	72	45	124	946
5:45 PM	93	364	0	0	217	42	0	0	0	68	49	127	960
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	631	2793	0	0	1719	387	0	0	0	452	310	748	7040
APPROACH %'s :	18.43%	81.57%	0.00%	0.00%	81.62%	18.38%	#DIV/0!	#DIV/0!	#DIV/0!	29.93%	20.53%	49.54%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	326	1399	0	0	852	197	0	0	0	266	177	448	3665
PEAK HR FACTOR :		0.944			0.975			0.000			0.913		0.954

UTURNS	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	NB	SB	EB	WB
	0	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

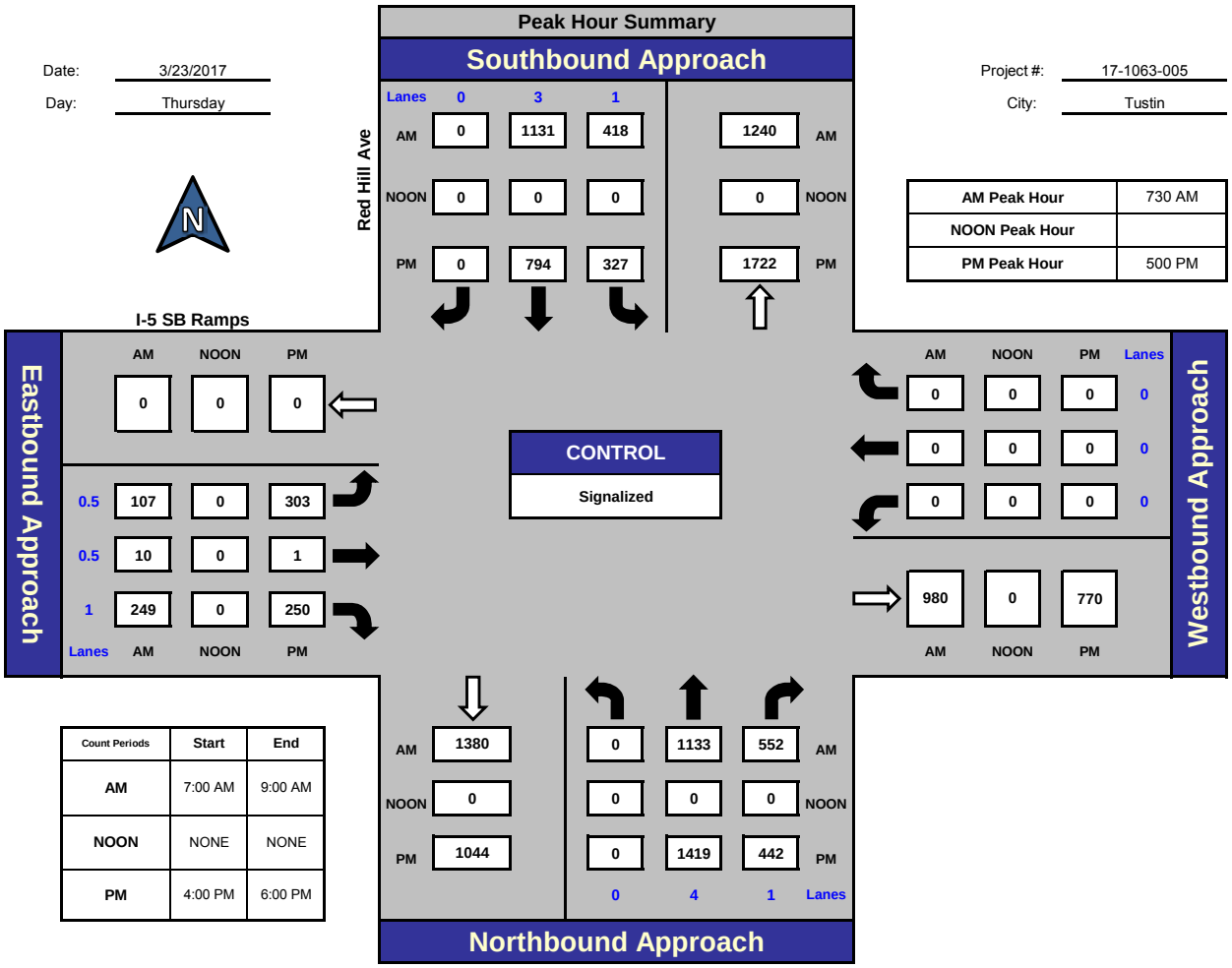
National Data & Surveying Services

Red Hill Ave and I-5 SB Ramps , Tustin

Date: 3/23/2017
Day: Thursday

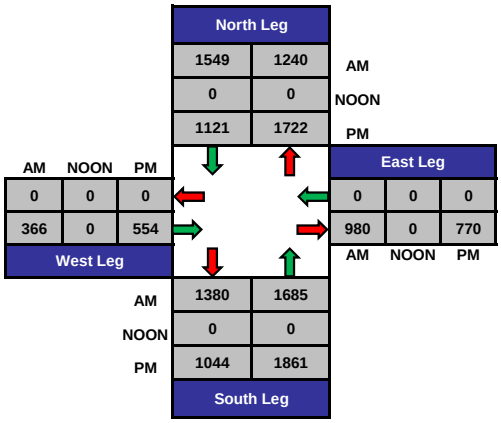
Project #: 17-1063-005
City: Tustin

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

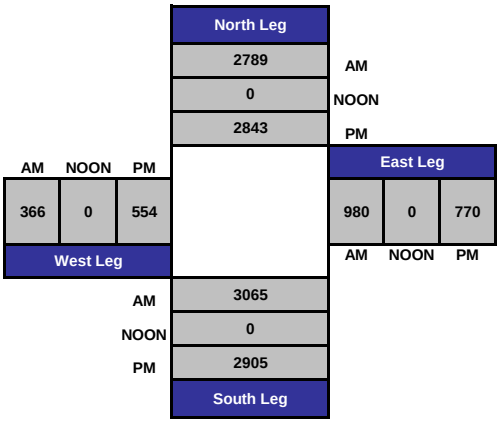


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-005

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	4	1	1	3	0	0.5	0.5	1	0	0	0					
7:00 AM	0	148	86	102	162	0	35	0	31	0	0	0	564	0	0	0	0
7:15 AM	0	244	138	104	225	0	42	0	54	0	0	0	807	0	0	0	0
7:30 AM	0	390	145	93	265	0	29	0	65	0	0	0	987	0	0	0	0
7:45 AM	0	321	144	83	326	0	24	5	64	0	0	0	967	0	0	0	0
8:00 AM	0	211	126	120	262	0	32	2	64	0	0	0	817	0	0	0	0
8:15 AM	0	211	137	122	278	0	22	3	56	0	0	0	829	0	0	0	0
8:30 AM	0	158	112	93	244	0	40	4	63	0	0	0	714	0	0	0	0
8:45 AM	0	161	105	74	199	0	49	0	45	0	0	0	633	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	1844	993	791	1961	0	273	14	442	0	0	0	6318	0	0	0	0
APPROACH %'s :	0.00%	65.00%	35.00%	28.74%	71.26%	0.00%	37.45%	1.92%	60.63%	#DIV/0!	#DIV/0!	#DIV/0!					
PEAK HR START TIME :	730 AM												TOTAL				
PEAK HR VOL :	0	1133	552	418	1131	0	107	10	249	0	0	0	3600				
PEAK HR FACTOR :		0.787			0.947			0.934			0.000		0.912				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-005

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	4	1	1	3	0	0.5	0.5	1	0	0	0					
4:00 PM	0	336	85	67	186	0	53	0	67	0	0	0	794	0	0	0	0
4:15 PM	0	389	81	101	182	0	69	0	55	0	0	0	877	0	0	0	0
4:30 PM	0	376	112	70	188	0	58	3	72	0	0	0	879	0	0	0	0
4:45 PM	0	340	98	87	179	0	68	2	65	0	0	0	839	0	0	0	0
5:00 PM	0	321	117	72	192	0	68	0	63	0	0	0	833	0	0	0	0
5:15 PM	0	361	99	74	192	0	82	0	73	0	0	0	881	0	0	0	0
5:30 PM	0	373	97	92	204	0	71	0	64	0	0	0	901	0	0	0	0
5:45 PM	0	364	129	89	206	0	82	1	50	0	0	0	921	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	2860	818	652	1529	0	551	6	509	0	0	0	6925	0	0	0	0
APPROACH %'s :	0.00%	77.76%	22.24%	29.89%	70.11%	0.00%	51.69%	0.56%	47.75%	#DIV/0!	#DIV/0!	#DIV/0!					
PEAK HR START TIME :	500 PM												TOTAL				
PEAK HR VOL :	0	1419	442	327	794	0	303	1	250	0	0	0	3536				
PEAK HR FACTOR :		0.944			0.947			0.894			0.000		0.960				

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

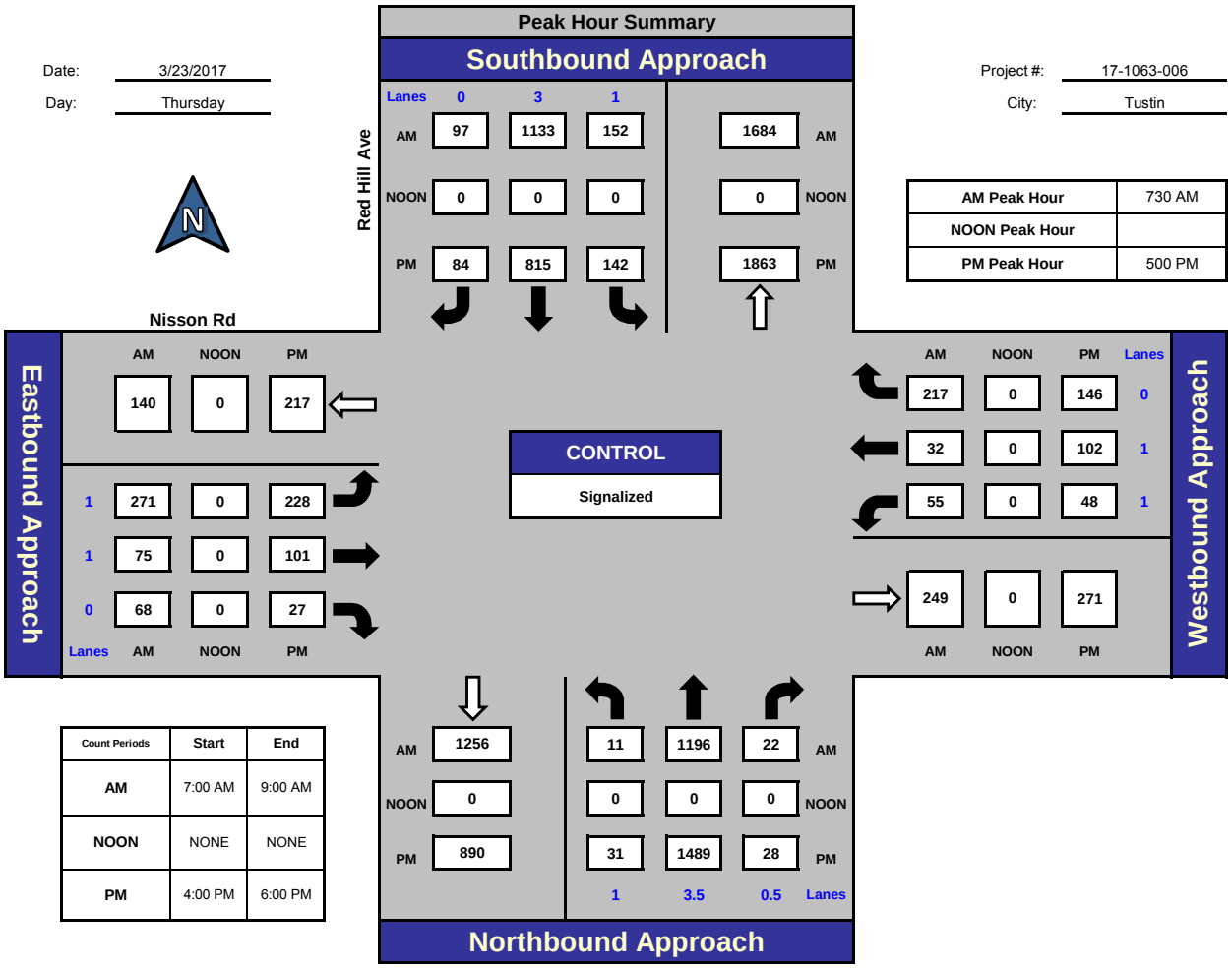
National Data & Surveying Services

Red Hill Ave and Nisson Rd , Tustin

Date: 3/23/2017
Day: Thursday

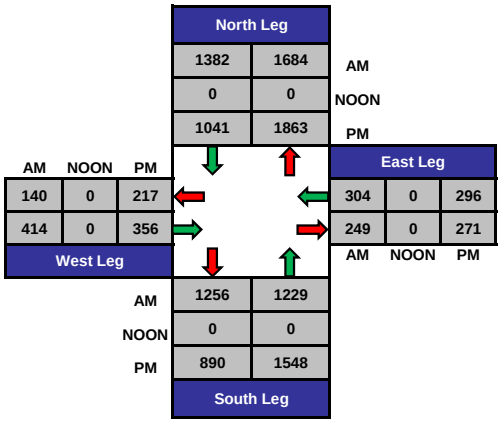
Project #: 17-1063-006
City: Tustin

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

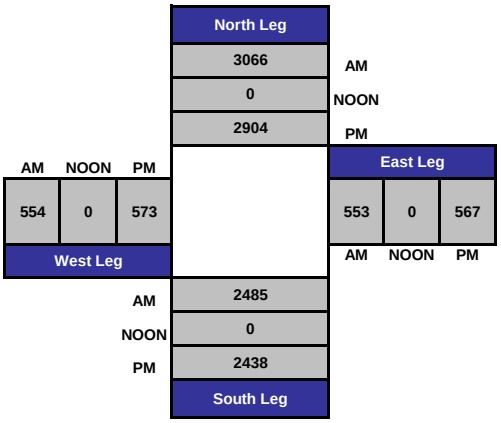


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-006

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3.5	0.5	1	3	0	1	1	0	1	1	0	
7:00 AM	3	178	3	7	177	10	30	13	7	5	6	30	469
7:15 AM	0	264	7	18	238	13	62	20	10	11	3	52	698
7:30 AM	2	392	6	37	269	28	76	15	14	13	6	71	929
7:45 AM	4	325	4	51	295	37	76	32	17	10	9	57	917
8:00 AM	1	240	8	42	273	16	59	14	24	18	9	38	742
8:15 AM	4	239	4	22	296	16	60	14	13	14	8	51	741
8:30 AM	1	202	6	15	280	6	41	14	11	10	5	25	616
8:45 AM	2	194	2	17	217	15	43	12	8	9	4	30	553
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	17	2034	40	209	2045	141	447	134	104	90	50	354	5665
APPROACH %'s :	0.81%	97.27%	1.91%	8.73%	85.39%	5.89%	65.26%	19.56%	15.18%	18.22%	10.12%	71.66%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	11	1196	22	152	1133	97	271	75	68	55	32	217	3329
PEAK HR FACTOR :		0.768			0.902			0.828			0.844		0.896

UTURNS

	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	NB	SB	EB	WB
	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-006

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	3.5	0.5	1	3	0	1	1	0	1	1	0					
4:00 PM	10	353	9	38	182	22	39	14	7	11	12	30	727	0	0	0	0
4:15 PM	6	382	10	26	192	29	46	12	2	9	11	33	758	0	0	0	0
4:30 PM	3	392	8	41	192	25	66	13	6	9	18	38	811	0	0	0	0
4:45 PM	9	345	13	40	198	17	41	21	4	12	22	48	770	0	0	0	0
5:00 PM	8	348	5	42	190	23	59	23	6	16	24	37	781	0	0	0	0
5:15 PM	8	359	10	35	200	18	61	33	7	9	24	31	795	0	0	0	0
5:30 PM	6	387	5	40	220	22	50	22	9	17	25	43	846	0	0	0	0
5:45 PM	9	395	8	25	205	21	58	23	5	6	29	35	819	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	59	2961	68	287	1579	177	420	161	46	89	165	295	6307	0	0	0	0
APPROACH %'s :	1.91%	95.89%	2.20%	14.05%	77.29%	8.66%	66.99%	25.68%	7.34%	16.21%	30.05%	53.73%					
PEAK HR START TIME :	500 PM												TOTAL				
PEAK HR VOL :	31	1489	28	142	815	84	228	101	27	48	102	146	3241				
PEAK HR FACTOR :		0.939			0.923			0.881			0.871		0.958				

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Red Hill Ave and Mitchell Ave , Tustin

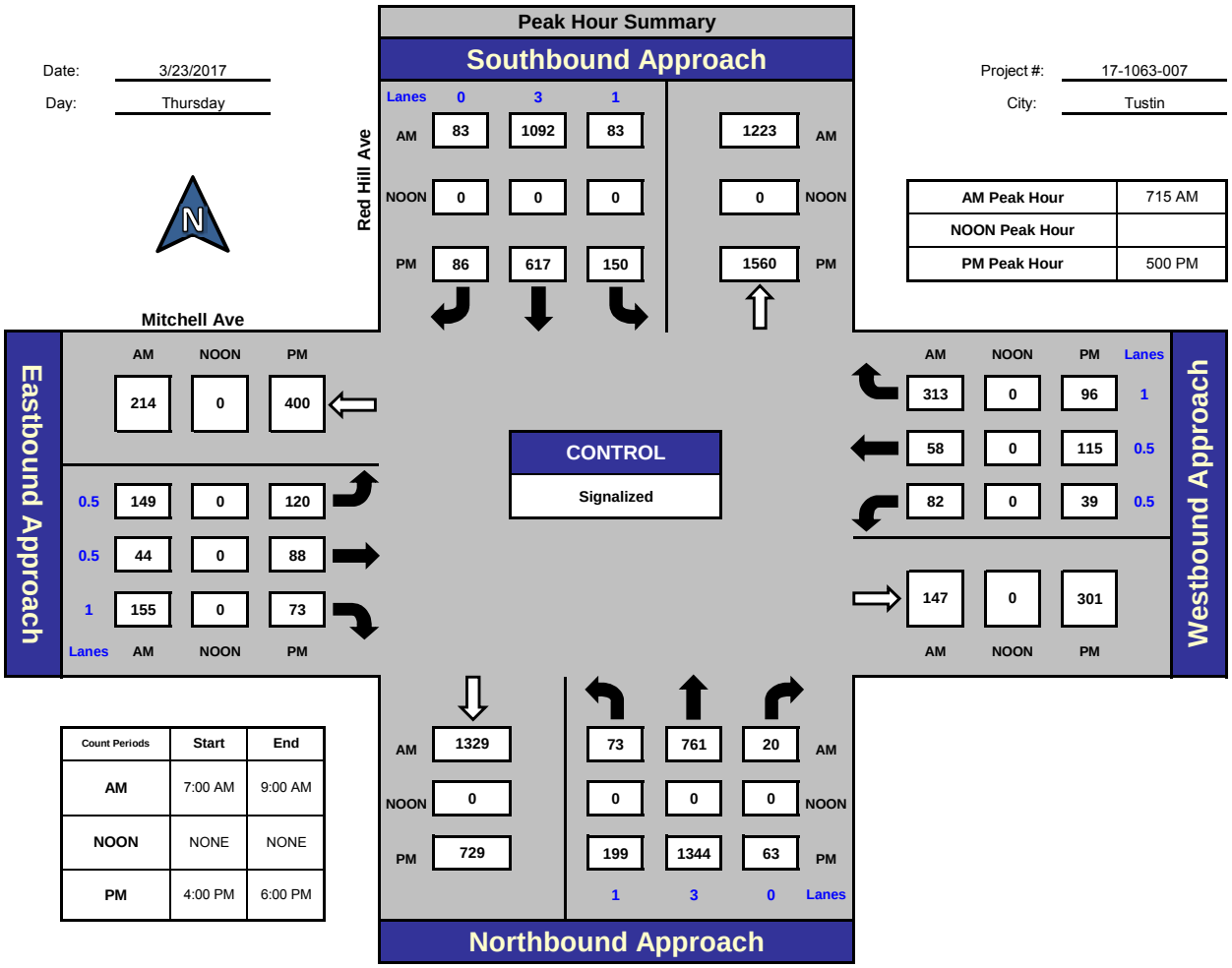
Date: 3/23/2017

Day: Thursday

Project #: 17-1063-007

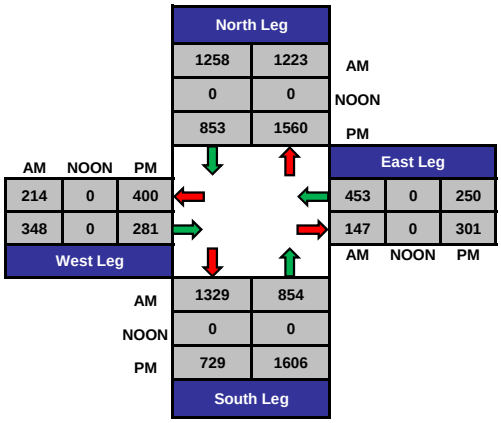
City: Tustin

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

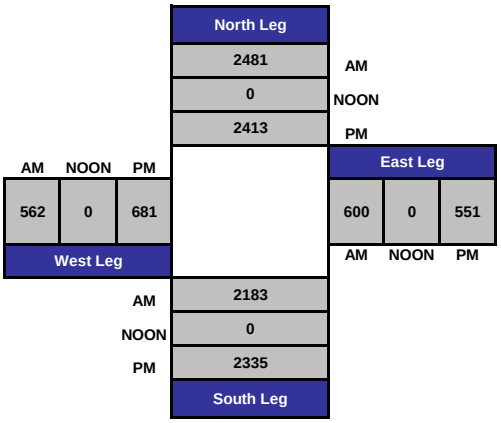


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-007

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0.5	0.5	1	0.5	0.5	1	
7:00 AM	9	114	5	12	158	17	14	8	9	9	9	50	414
7:15 AM	14	167	4	14	235	13	29	10	27	14	11	88	626
7:30 AM	18	231	4	32	273	23	47	9	37	27	12	108	821
7:45 AM	28	198	10	21	296	24	43	9	59	21	21	70	800
8:00 AM	13	165	2	16	288	23	30	16	32	20	14	47	666
8:15 AM	17	187	2	7	300	8	12	13	27	10	8	33	624
8:30 AM	17	141	3	10	269	13	27	6	23	7	11	30	557
8:45 AM	8	148	2	14	223	13	16	4	11	6	8	28	481
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	124	1351	32	126	2042	134	218	75	225	114	94	454	4989
APPROACH %'s :	8.23%	89.65%	2.12%	5.47%	88.71%	5.82%	42.08%	14.48%	43.44%	17.22%	14.20%	68.58%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	73	761	20	83	1092	83	149	44	155	82	58	313	2913
PEAK HR FACTOR :		0.844			0.922			0.784			0.770		0.887

UTURNS

NB	SB	EB	WB
0	0	0	0
0	0	0	0
2	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
NB	SB	EB	WB
2	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-007

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0.5	0.5	1	0.5	0.5	1	
4:00 PM	27	354	10	18	149	23	15	15	11	8	13	19	662
4:15 PM	36	392	8	35	150	24	20	15	12	9	19	23	743
4:30 PM	34	342	12	19	158	28	33	12	11	8	14	22	693
4:45 PM	36	380	15	27	180	29	22	19	10	7	19	31	775
5:00 PM	57	312	25	30	127	16	26	29	21	7	31	21	702
5:15 PM	48	334	13	42	133	23	32	20	21	11	27	27	731
5:30 PM	47	342	9	39	178	24	32	21	20	8	34	28	782
5:45 PM	47	356	16	39	179	23	30	18	11	13	23	20	775
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	332	2812	108	249	1254	190	210	149	117	71	180	191	5863
APPROACH %'s :	10.21%	86.47%	3.32%	14.71%	74.07%	11.22%	44.12%	31.30%	24.58%	16.06%	40.72%	43.21%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	199	1344	63	150	617	86	120	88	73	39	115	96	2990
PEAK HR FACTOR :		0.958			0.885			0.924			0.893		0.956

UTURNS				
	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	0	0
	1	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	NB	SB	EB	WB
	1	0	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Red Hill Ave and Walnut Ave , Tustin

Date: 3/23/2017

Day: Thursday

Project #: 17-1063-008

City: Tustin

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Southbound Approach (Red Hill Ave)

Lanes	0	3	1	
AM	130	1129	124	796 AM
NOON	0	0	0	0 NOON
PM	122	448	161	1610 PM

Eastbound Approach (Walnut Ave)

Lanes	AM	NOON	PM
	521	0	1137
1	138	0	103
2	453	0	289
0	354	0	124

Westbound Approach

Lanes	AM	NOON	PM
0	131	0	137
2	260	0	672
2	218	0	236
	714	0	575

Northbound Approach

AM	1701	131	527	137 AM
NOON	0	0	0	0 NOON
PM	808	343	1370	125 PM
Lanes		1	3	0 Lanes

CONTROL: Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

	AM	NOON	PM
North Leg	1383	0	731
	796	0	1610
East Leg	609	0	1045
	714	0	575
West Leg	521	0	1137
	945	0	516
South Leg	1701	0	808
	795	0	1838

Total Volume Per Leg

	AM	NOON	PM
North Leg	2179	0	2341
East Leg	1323	0	1620
West Leg	1466	0	1653
South Leg	2496	0	2646

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-008

Day: Thursday

City: Tustin

Date: 3/23/2017

AM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	2	0	2	2	0	
7:00 AM	13	80	22	12	150	15	12	91	67	34	37	14	547
7:15 AM	20	96	21	23	228	18	39	80	87	44	44	42	742
7:30 AM	37	139	31	29	280	19	42	115	103	53	54	32	934
7:45 AM	56	143	41	34	268	49	38	136	76	54	66	34	995
8:00 AM	28	104	22	32	283	38	30	124	93	61	81	34	930
8:15 AM	10	141	43	29	298	24	28	78	82	50	59	31	873
8:30 AM	17	106	27	32	262	17	18	89	84	51	55	21	779
8:45 AM	22	99	30	22	211	18	27	78	58	38	55	31	689
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	203	908	237	213	1980	198	234	791	650	385	451	239	6489
APPROACH %'s :	15.06%	67.36%	17.58%	8.91%	82.81%	8.28%	13.97%	47.22%	38.81%	35.81%	41.95%	22.23%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	131	527	137	124	1129	130	138	453	354	218	260	131	3732
PEAK HR FACTOR :		0.828			0.979			0.909			0.865		0.938

UTURNS	NB	SB	EB	WB
	1	0	0	0
	3	0	0	0
	3	1	0	0
	7	0	0	0
	3	0	0	0
	2	0	0	0
	2	0	0	0
	5	1	0	0
	NB	SB	EB	WB
	26	2	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1063-008

Day: Thursday

City: Tustin

Date: 3/23/2017

PM

NS/EW Streets:	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	3	0	1	3	0	1	2	0	2	2	0					
4:00 PM	65	338	28	29	100	28	26	60	23	48	168	43	956	4	0	0	0
4:15 PM	80	374	20	29	110	27	23	65	29	65	170	43	1035	2	1	0	0
4:30 PM	102	335	26	27	99	39	23	70	15	58	165	36	995	0	0	0	0
4:45 PM	93	386	31	34	123	30	27	64	31	54	171	39	1083	2	0	0	0
5:00 PM	72	351	29	36	90	23	30	64	28	65	160	41	989	2	0	0	0
5:15 PM	85	312	32	43	108	26	27	77	28	46	173	38	995	2	0	0	0
5:30 PM	101	331	36	44	124	35	23	69	28	54	167	28	1040	0	0	0	0
5:45 PM	85	376	28	38	126	38	23	79	40	71	172	30	1106	3	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	683	2803	230	280	880	246	202	548	222	461	1346	298	8199	15	1	0	0
APPROACH %'s :	18.38%	75.43%	6.19%	19.91%	62.59%	17.50%	20.78%	56.38%	22.84%	21.90%	63.94%	14.16%					
PEAK HR START TIME :	500 PM												TOTAL				
PEAK HR VOL :	343	1370	125	161	448	122	103	289	124	236	672	137	4130				
PEAK HR FACTOR :		0.940			0.900			0.908			0.957		0.934				

CONTROL : Signalized

Prepared by NDS/ATD

VOLUME

Red Hill Ave Bet. Bryan Ave & San Juan St

Day: Thursday
Date: 3/23/2017

City: Tustin
Project #: CA17_1064_001

DAILY TOTALS	NB	SB	EB	WB	Total
	11,629	10,209	0	0	21,838

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	29		12				41		12:00	178		132				310	
00:15	17		19				36		12:15	167		158				325	
00:30	28		15				43		12:30	164		135				299	
00:45	12	86	8	54			20	140	12:45	191	700	152	577			343	1277
01:00	10		4				14		13:00	177		155				332	
01:15	12		3				15		13:15	203		168				371	
01:30	5		2				7		13:30	171		162				333	
01:45	10	37	4	13			14	50	13:45	171	722	134	619			305	1341
02:00	5		6				11		14:00	196		142				338	
02:15	5		3				8		14:15	215		148				363	
02:30	9		6				15		14:30	238		141				379	
02:45	8	27	5	20			13	47	14:45	238	887	169	600			407	1487
03:00	7		6				13		15:00	221		171				392	
03:15	6		4				10		15:15	233		165				398	
03:30	2		4				6		15:30	265		174				439	
03:45	5	20	4	18			9	38	15:45	226	945	160	670			386	1615
04:00	3		5				8		16:00	255		162				417	
04:15	6		13				19		16:15	264		139				403	
04:30	9		17				26		16:30	261		184				445	
04:45	7	25	14	49			21	74	16:45	271	1051	159	644			430	1695
05:00	11		28				39		17:00	246		208				454	
05:15	21		48				69		17:15	253		170				423	
05:30	21		44				65		17:30	298		189				487	
05:45	27	80	58	178			85	258	17:45	289	1086	176	743			465	1829
06:00	31		52				83		18:00	332		152				484	
06:15	43		90				133		18:15	280		146				426	
06:30	71		159				230		18:30	252		138				390	
06:45	87	232	132	433			219	665	18:45	237	1101	157	593			394	1694
07:00	103		201				304		19:00	225		112				337	
07:15	128		254				382		19:15	150		126				276	
07:30	193		306				499		19:30	144		113				257	
07:45	199	623	265	1026			464	1649	19:45	116	635	85	436			201	1071
08:00	200		273				473		20:00	111		99				210	
08:15	142		304				446		20:15	110		98				208	
08:30	134		223				357		20:30	109		95				204	
08:45	126	602	207	1007			333	1609	20:45	118	448	74	366			192	814
09:00	120		176				296		21:00	88		93				181	
09:15	116		159				275		21:15	81		63				144	
09:30	131		154				285		21:30	76		59				135	
09:45	121	488	133	622			254	1110	21:45	80	325	38	253			118	578
10:00	136		135				271		22:00	60		39				99	
10:15	133		121				254		22:15	58		39				97	
10:30	132		121				253		22:30	58		34				92	
10:45	135	536	143	520			278	1056	22:45	49	225	30	142			79	367
11:00	138		145				283		23:00	42		24				66	
11:15	164		108				272		23:15	26		19				45	
11:30	164		163				327		23:30	31		14				45	
11:45	157	623	136	552			293	1175	23:45	26	125	17	74			43	199
TOTALS		3379		4492				7871	TOTALS		8250		5717				13967
SPLIT %		42.9%		57.1%				36.0%	SPLIT %		59.1%		40.9%				64.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	11,629	10,209	0	0	21,838

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	17:30	17:00			17:30
AM Pk Volume	734	1148			1882	PM Pk Volume	1199	743			1862
Pk Hr Factor	0.918	0.938			0.943	Pk Hr Factor	0.903	0.893			0.956
7 - 9 Volume	1225	2033	0	0	3258	4 - 6 Volume	2137	1387	0	0	3524
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	734	1148	0	0	1882	4 - 6 PK Volume	1086	743	0	0	1829
Pk Hr Factor	0.918	0.938	0.000	0.000	0.943	Pk Hr Factor	0.911	0.893	0.000	0.000	0.939

Prepared by NDS/ATD

VOLUME

Red Hill Ave Bet. San Juan St & El Camino Real

Day: Thursday
Date: 3/23/2017

City: Tustin
Project #: CA17_1064_002

DAILY TOTALS	NB	SB	EB	WB	Total
	13,585	12,276	0	0	25,861

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	36		17						53		12:00	218		144						362	
00:15	27		21						48		12:15	205		181						386	
00:30	32		20						52		12:30	198		158						356	
00:45	23	118	10	68					33	186	12:45	236	857	168	651					404	1508
01:00	16		6						22		13:00	194		172						366	
01:15	17		6						23		13:15	222		177						399	
01:30	10		3						13		13:30	183		176						359	
01:45	13	56	6	21					19	77	13:45	207	806	144	669					351	1475
02:00	10		11						21		14:00	226		178						404	
02:15	13		5						18		14:15	224		195						419	
02:30	12		8						20		14:30	262		222						484	
02:45	12	47	6	30					18	77	14:45	279	991	217	812					496	1803
03:00	9		8						17		15:00	239		206						445	
03:15	5		9						14		15:15	252		204						456	
03:30	1		8						9		15:30	298		204						502	
03:45	5	20	9	34					14	54	15:45	237	1026	171	785					408	1811
04:00	5		9						14		16:00	286		179						465	
04:15	9		25						34		16:15	301		151						452	
04:30	10		31						41		16:30	285		193						478	
04:45	11	35	26	91					37	126	16:45	328	1200	191	714					519	1914
05:00	17		39						56		17:00	290		213						503	
05:15	20		63						83		17:15	301		212						513	
05:30	28		68						96		17:30	343		192						535	
05:45	38	103	93	263					131	366	17:45	326	1260	203	820					529	2080
06:00	38		74						112		18:00	354		166						520	
06:15	54		123						177		18:15	327		165						492	
06:30	87		207						294		18:30	294		164						458	
06:45	103	282	196	600					299	882	18:45	255	1230	174	669					429	1899
07:00	119		241						360		19:00	261		138						399	
07:15	159		310						469		19:15	179		145						324	
07:30	225		390						615		19:30	180		131						311	
07:45	220	723	344	1285					564	2008	19:45	160	780	109	523					269	1303
08:00	224		323						547		20:00	146		108						254	
08:15	161		365						526		20:15	133		129						262	
08:30	154		285						439		20:30	130		112						242	
08:45	142	681	243	1216					385	1897	20:45	142	551	88	437					230	988
09:00	137		201						338		21:00	114		117						231	
09:15	140		192						332		21:15	114		87						201	
09:30	140		185						325		21:30	112		83						195	
09:45	136	553	150	728					286	1281	21:45	102	442	45	332					147	774
10:00	158		151						309		22:00	81		50						131	
10:15	163		141						304		22:15	86		47						133	
10:30	162		133						295		22:30	76		42						118	
10:45	144	627	162	587					306	1214	22:45	69	312	39	178					108	490
11:00	164		152						316		23:00	56		34						90	
11:15	199		142						341		23:15	29		24						53	
11:30	183		191						374		23:30	50		25						75	
11:45	171	717	162	647					333	1364	23:45	33	168	33	116					66	284
TOTALS		3962		5570						9532	TOTALS		9623		6706						16329
SPLIT %		41.6%		58.4%						36.9%	SPLIT %		58.9%		41.1%						63.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	13,585	12,276	0	0	25,861

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	17:30	14:30			17:15
AM Pk Volume	830	1422			2252	PM Pk Volume	1350	849			2097
Pk Hr Factor	0.922	0.912			0.915	Pk Hr Factor	0.953	0.956			0.980
7 - 9 Volume	1404	2501	0	0	3905	4 - 6 Volume	2460	1534	0	0	3994
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	830	1422	0	0	2252	4 - 6 PK Volume	1262	820	0	0	2080
Pk Hr Factor	0.922	0.912	0.000	0.000	0.915	Pk Hr Factor	0.920	0.962	0.000	0.000	0.972

Prepared by NDS/ATD

VOLUME

Red Hill Ave Bet. Nisson Rd & Mitchell Ave

Day: Thursday
Date: 3/23/2017

City: Tustin
Project #: CA17_1064_003

DAILY TOTALS	NB	SB	EB	WB	Total
	15,616	13,559	0	0	29,175

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	23		30						53		12:00	200		209						409	
00:15	29		38						67		12:15	196		219						415	
00:30	30		35						65		12:30	208		184						392	
00:45	13	95	19	122					32	217	12:45	222	826	182	794					404	1620
01:00	12		18						30		13:00	189		201						390	
01:15	15		21						36		13:15	196		193						389	
01:30	17		15						32		13:30	194		218						412	
01:45	10	54	20	74					30	128	13:45	225	804	183	795					408	1599
02:00	10		14						24		14:00	221		202						423	
02:15	15		12						27		14:15	224		185						409	
02:30	11		7						18		14:30	344		214						558	
02:45	6	42	13	46					19	88	14:45	292	1081	249	850					541	1931
03:00	8		12						20		15:00	307		233						540	
03:15	6		8						14		15:15	326		201						527	
03:30	13		7						20		15:30	337		185						522	
03:45	12	39	9	36					21	75	15:45	340	1310	185	804					525	2114
04:00	11		12						23		16:00	360		181						541	
04:15	25		21						46		16:15	412		218						630	
04:30	31		24						55		16:30	394		189						583	
04:45	31	98	36	93					67	191	16:45	358	1524	226	814					584	2338
05:00	25		23						48		17:00	363		164						527	
05:15	42		42						84		17:15	367		232						599	
05:30	87		58						145		17:30	400		216						616	
05:45	85	239	100	223					185	462	17:45	410	1540	226	838					636	2378
06:00	87		98						185		18:00	353		203						556	
06:15	131		101						232		18:15	357		220						577	
06:30	209		175						384		18:30	307		238						545	
06:45	166	593	187	561					353	1154	18:45	289	1306	202	863					491	2169
07:00	180		179						359		19:00	248		165						413	
07:15	279		244						523		19:15	178		194						372	
07:30	368		300						668		19:30	187		160						347	
07:45	304	1131	312	1035					616	2166	19:45	146	759	149	668					295	1427
08:00	229		321						550		20:00	148		131						279	
08:15	255		310						565		20:15	127		145						272	
08:30	190		288						478		20:30	122		145						267	
08:45	182	856	218	1137					400	1993	20:45	124	521	140	561					264	1082
09:00	174		216						390		21:00	120		148						268	
09:15	151		184						335		21:15	115		126						241	
09:30	170		201						371		21:30	98		138						236	
09:45	144	639	173	774					317	1413	21:45	89	422	112	524					201	946
10:00	135		149						284		22:00	64		104						168	
10:15	146		160						306		22:15	82		85						167	
10:30	163		162						325		22:30	63		82						145	
10:45	169	613	161	632					330	1245	22:45	37	246	79	350					116	596
11:00	184		184						368		23:00	58		66						124	
11:15	175		178						353		23:15	36		63						99	
11:30	175		197						372		23:30	36		57						93	
11:45	191	725	181	740					372	1465	23:45	23	153	39	225					62	378
TOTALS		5124		5473						10597	TOTALS		10492		8086						18578
SPLIT %		48.4%		51.6%						36.3%	SPLIT %		56.5%		43.5%						63.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	15,616	13,559	0	0	29,175

AM Peak Hour	07:15	07:30			07:30	PM Peak Hour	17:00	14:30			17:15
AM Pk Volume	1180	1243			2399	PM Pk Volume	1540	897			2407
Pk Hr Factor	0.802	0.968			0.898	Pk Hr Factor	0.939	0.901			0.946
7 - 9 Volume	1987	2172	0	0	4159	4 - 6 Volume	3064	1652	0	0	4716
7 - 9 Peak Hour	07:15	07:30			07:30	4 - 6 Peak Hour	17:00	16:45			17:00
7 - 9 Pk Volume	1180	1243	0	0	2399	4 - 6 PK Volume	1540	838	0	0	2378
Pk Hr Factor	0.802	0.968	0.000	0.000	0.898	Pk Hr Factor	0.939	0.903	0.000	0.000	0.935

Prepared by NDS/ATD

VOLUME

Red Hill Ave Bet. Mitchell Ave & Walnut Ave

Day: Thursday
Date: 3/23/2017

City: Tustin
Project #: CA17_1064_004

DAILY TOTALS	NB	SB	EB	WB	Total
	14,305	12,405	0	0	26,710

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	22		27						49		12:00	218		190						408	
00:15	22		18						40		12:15	198		192						390	
00:30	26		23						49		12:30	204		203						407	
00:45	15	85	14	82					29	167	12:45	197	817	176	761					373	1578
01:00	12		11						23		13:00	182		194						376	
01:15	11		10						21		13:15	162		168						330	
01:30	8		24						32		13:30	210		211						421	
01:45	3	34	8	53					11	87	13:45	210	764	169	742					379	1506
02:00	8		8						16		14:00	214		187						401	
02:15	13		9						22		14:15	218		181						399	
02:30	10		9						19		14:30	302		219						521	
02:45	6	37	11	37					17	74	14:45	291	1025	218	805					509	1830
03:00	3		8						11		15:00	328		184						512	
03:15	2		5						7		15:15	345		164						509	
03:30	7		9						16		15:30	354		167						521	
03:45	5	17	12	34					17	51	15:45	341	1368	164	679					505	2047
04:00	12		13						25		16:00	376		161						537	
04:15	9		21						30		16:15	435		167						602	
04:30	13		27						40		16:30	391		162						553	
04:45	16	50	51	112					67	162	16:45	429	1631	206	696					635	2327
05:00	20		27						47		17:00	404		145						549	
05:15	24		43						67		17:15	386		172						558	
05:30	50		65						115		17:30	387		197						584	
05:45	40	134	106	241					146	375	17:45	424	1601	198	712					622	2313
06:00	52		89						141		18:00	386		172						558	
06:15	67		105						172		18:15	338		189						527	
06:30	136		168						304		18:30	326		188						514	
06:45	105	360	186	548					291	908	18:45	279	1329	172	721					451	2050
07:00	123		179						302		19:00	229		157						386	
07:15	176		272						448		19:15	173		170						343	
07:30	230		324						554		19:30	164		126						290	
07:45	214	743	366	1141					580	1884	19:45	118	684	118	571					236	1255
08:00	185		345						530		20:00	138		117						255	
08:15	195		340						535		20:15	115		121						236	
08:30	165		293						458		20:30	112		101						213	
08:45	149	694	247	1225					396	1919	20:45	103	468	107	446					210	914
09:00	141		218						359		21:00	115		95						210	
09:15	112		178						290		21:15	108		94						202	
09:30	130		188						318		21:30	99		96						195	
09:45	116	499	169	753					285	1252	21:45	79	401	79	364					158	765
10:00	116		145						261		22:00	62		68						130	
10:15	137		151						288		22:15	68		60						128	
10:30	130		151						281		22:30	50		59						109	
10:45	141	524	149	596					290	1120	22:45	31	211	42	229					73	440
11:00	163		173						336		23:00	44		51						95	
11:15	175		170						345		23:15	34		44						78	
11:30	174		189						363		23:30	30		42						72	
11:45	192	704	157	689					349	1393	23:45	17	125	31	168					48	293
TOTALS		3881		5511						9392	TOTALS		10424		6894						17318
SPLIT %		41.3%		58.7%						35.2%	SPLIT %		60.2%		39.8%						64.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,305	12,405	0	0	26,710

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	16:15	14:00			16:15
AM Pk Volume	824	1375			2199	PM Pk Volume	1659	805			2339
Pk Hr Factor	0.896	0.939			0.948	Pk Hr Factor	0.953	0.919			0.921
7 - 9 Volume	1437	2366	0	0	3803	4 - 6 Volume	3232	1408	0	0	4640
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:15	16:45			16:15
7 - 9 Pk Volume	824	1375	0	0	2199	4 - 6 PK Volume	1659	720	0	0	2339
Pk Hr Factor	0.896	0.939	0.000	0.000	0.948	Pk Hr Factor	0.953	0.874	0.000	0.000	0.921

Prepared by NDS/ATD

VOLUME

Red Hill Ave Bet. Walnut Ave & Sycamore Ave

Day: Thursday
Date: 3/23/2017

City: Tustin
Project #: CA17_1064_005

DAILY TOTALS	NB	SB	EB	WB	Total
	14,553	13,181	0	0	27,734

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	16		14				30		12:00	213		204				417	
00:15	20		13				33		12:15	198		192				390	
00:30	20		27				47		12:30	182		193				375	
00:45	16	72	10	64			26	136	12:45	174	767	217	806			391	1573
01:00	11		12				23		13:00	187		198				385	
01:15	10		8				18		13:15	168		175				343	
01:30	11		7				18		13:30	185		199				384	
01:45	4	36	13	40			17	76	13:45	196	736	173	745			369	1481
02:00	11		8				19		14:00	183		192				375	
02:15	9		9				18		14:15	204		189				393	
02:30	9		8				17		14:30	322		201				523	
02:45	4	33	10	35			14	68	14:45	282	991	212	794			494	1785
03:00	5		6				11		15:00	365		183				548	
03:15	0		7				7		15:15	338		161				499	
03:30	9		20				29		15:30	421		179				600	
03:45	6	20	9	42			15	62	15:45	384	1508	169	692			553	2200
04:00	16		15				31		16:00	425		163				588	
04:15	7		28				35		16:15	484		204				688	
04:30	13		33				46		16:30	457		159				616	
04:45	23	59	53	129			76	188	16:45	509	1875	207	733			716	2608
05:00	31		31				62		17:00	463		178				641	
05:15	23		59				82		17:15	422		163				585	
05:30	40		78				118		17:30	474		203				677	
05:45	47	141	132	300			179	441	17:45	490	1849	228	772			718	2621
06:00	44		110				154		18:00	448		178				626	
06:15	70		132				202		18:15	359		189				548	
06:30	90		197				287		18:30	336		189				525	
06:45	105	309	228	667			333	976	18:45	266	1409	175	731			441	2140
07:00	113		247				360		19:00	227		159				386	
07:15	140		348				488		19:15	177		160				337	
07:30	212		442				654		19:30	156		126				282	
07:45	241	706	419	1456			660	2162	19:45	117	677	102	547			219	1224
08:00	162		404				566		20:00	130		92				222	
08:15	186		418				604		20:15	81		87				168	
08:30	161		390				551		20:30	101		78				179	
08:45	150	659	294	1506			444	2165	20:45	105	417	77	334			182	751
09:00	142		249				391		21:00	112		80				192	
09:15	107		212				319		21:15	84		65				149	
09:30	116		210				326		21:30	98		63				161	
09:45	105	470	193	864			298	1334	21:45	62	356	59	267			121	623
10:00	116		156				272		22:00	63		49				112	
10:15	138		174				312		22:15	52		44				96	
10:30	113		169				282		22:30	36		45				81	
10:45	120	487	155	654			275	1141	22:45	24	175	30	168			54	343
11:00	157		180				337		23:00	44		34				78	
11:15	149		170				319		23:15	30		27				57	
11:30	194		199				393		23:30	28		38				66	
11:45	181	681	168	717			349	1398	23:45	18	120	19	118			37	238
TOTALS		3673		6474				10147	TOTALS		10880		6707				17587
SPLIT %		36.2%		63.8%				36.6%	SPLIT %		61.9%		38.1%				63.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,553	13,181	0	0	27,734

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	16:15	12:00			16:15
AM Pk Volume	801	1683			2484	PM Pk Volume	1913	806			2661
Pk Hr Factor	0.831	0.952			0.941	Pk Hr Factor	0.940	0.929			0.929
7 - 9 Volume	1365	2962	0	0	4327	4 - 6 Volume	3724	1505	0	0	5229
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:15	17:00			16:15
7 - 9 Pk Volume	801	1683	0	0	2484	4 - 6 PK Volume	1913	772	0	0	2661
Pk Hr Factor	0.831	0.952	0.000	0.000	0.941	Pk Hr Factor	0.940	0.846	0.000	0.000	0.929

APPENDIX **B**

INTERSECTION ANALYSIS
WORKSHEETS

APPENDIX B-1

INTERSECTION ANALYSIS
WORKSHEETS –
EXISTING CONDITIONS

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill AM.vistro
Report File: K:\...\1 - EX AM.pdf

Scenario 1 EX AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	SB Thru	0.647	-	B
2	San Juan St / Red Hill Ave	Signalized	ICU 1	SB Thru	0.520	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	SB Thru	0.656	-	B
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	SB Right	0.596	-	A
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.684	-	B
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	SB Thru	0.624	-	B
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	SB Right	0.595	-	A
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	SB Thru	0.675	-	B
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	SB Thru	0.667	-	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	115	454	183	110	873	87	43	478	102	173	491	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	454	183	110	873	87	43	478	102	173	491	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	114	46	28	218	22	11	120	26	43	123	34
Total Analysis Volume [veh/h]	115	454	183	110	873	87	43	478	102	173	491	136
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.13	0.11	0.06	0.26	0.05	0.03	0.17	0.17	0.10	0.18	0.18
Intersection LOS	B											
Intersection V/C	0.647											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Base Volume Input [veh/h]	74	662	108	71	1084	64	40	89	125	213	57	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	662	108	71	1084	64	40	89	125	213	57	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	166	27	18	271	16	10	22	31	53	14	11
Total Analysis Volume [veh/h]	74	662	108	71	1084	64	40	89	125	213	57	43
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.15	0.15	0.04	0.23	0.23	0.02	0.08	0.07	0.13	0.16	0.03
Intersection LOS	A											
Intersection V/C	0.520											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	261	712	197	15	1289	60	83	166	184	266	193	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	261	712	197	15	1289	60	83	166	184	266	193	9
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	178	49	4	322	15	21	42	46	67	48	2
Total Analysis Volume [veh/h]	261	712	197	15	1289	60	83	166	184	266	193	9
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.14	0.12	0.01	0.26	0.26	0.05	0.10	0.11	0.16	0.12	0.12
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.596

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	257
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	257
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	238	0	0	317	119	0	0	0	53	1	64
Total Analysis Volume [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	257
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	0	4	0	0	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.19	0.00	0.00	0.25	0.28	0.00	0.00	0.00	0.06	0.06	0.15
Intersection LOS	A											
Intersection V/C	0.596											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.684

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1133	552	418	1131	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1133	552	418	1131	0	107	10	249	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	283	138	105	283	0	27	3	62	0	0	0
Total Analysis Volume [veh/h]	0	1133	552	418	1131	0	107	10	249	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.17	0.32	0.25	0.22	0.00	0.06	0.07	0.15	0.00	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.684											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.624

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	11	1196	22	152	1133	97	271	75	68	55	32	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1196	22	152	1133	97	271	75	68	55	32	217
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	299	6	38	283	24	68	19	17	14	8	54
Total Analysis Volume [veh/h]	11	1196	22	152	1133	97	271	75	68	55	32	217
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.18	0.18	0.09	0.22	0.06	0.16	0.08	0.08	0.03	0.15	0.15
Intersection LOS	B											
Intersection V/C	0.624											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.595

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	73	761	20	83	1092	83	149	44	155	82	58	313
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	761	20	83	1092	83	149	44	155	82	58	313
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	190	5	21	273	21	37	11	39	21	15	78
Total Analysis Volume [veh/h]	73	761	20	83	1092	83	149	44	155	82	58	313
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.15	0.15	0.05	0.23	0.23	0.09	0.11	0.09	0.05	0.08	0.18
Intersection LOS	A											
Intersection V/C	0.595											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	131	527	137	124	1129	130	138	453	354	218	260	131
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	131	527	137	124	1129	130	138	453	354	218	260	131
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	132	34	31	282	33	35	113	89	55	65	33
Total Analysis Volume [veh/h]	131	527	137	124	1129	130	138	453	354	218	260	131
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.13	0.13	0.07	0.25	0.25	0.08	0.24	0.24	0.06	0.12	0.12
Intersection LOS	B											
Intersection V/C	0.675											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	99	456	27	48	1562	228	154	94	253	101	103	125
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	456	27	48	1562	228	154	94	253	101	103	125
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	114	7	12	391	57	39	24	63	25	26	31
Total Analysis Volume [veh/h]	99	456	27	48	1562	228	154	94	253	101	103	125
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.09	0.09	0.03	0.35	0.35	0.09	0.06	0.15	0.06	0.06	0.07
Intersection LOS	B											
Intersection V/C	0.667											

Red Hill Corridor SP

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Report File: K:\...\1 - EX AM_HCM.pdf

Scenario 1 EX AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.712	20.3	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	SB Left	0.699	21.6	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	20.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.712

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	257
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	50
Total Hourly Volume [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	238	0	0	317	119	0	0	0	53	1	52
Total Analysis Volume [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	207
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	0	0	0	0	0	5	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	32	74	0	0	42	0	0	0	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	21	77	51	51		15	15	15
g / C, Green / Cycle	0.21	0.77	0.51	0.51		0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.25	0.30		0.06	0.06	0.13
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1776	1583
c, Capacity [veh/h]	382	3881	2586	807		275	275	246
d1, Uniform Delay [s]	38.22	3.40	16.03	17.21		37.99	37.99	41.06
k, delay calibration	0.19	0.50	0.50	0.50		0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	13.04	0.15	0.67	3.17		0.90	0.90	7.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

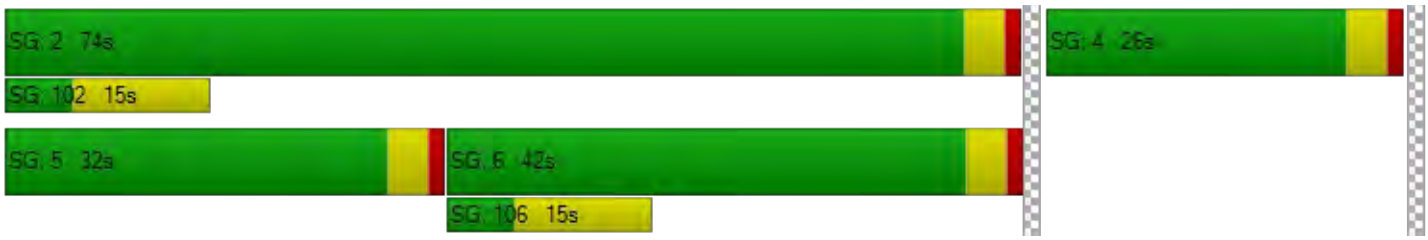
X, volume / capacity	0.90	0.25	0.49	0.59		0.39	0.39	0.84
d, Delay for Lane Group [s/veh]	51.26	3.55	16.70	20.38		38.88	38.88	48.74
Lane Group LOS	D	A	B	C		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh]	9.49	1.47	6.20	8.02		2.41	2.42	5.43
50th-Percentile Queue Length [ft]	237.20	36.76	155.06	200.58		60.33	60.38	135.74
95th-Percentile Queue Length [veh]	14.54	2.65	10.29	12.67		4.34	4.35	9.25
95th-Percentile Queue Length [ft]	363.49	66.16	257.17	316.72		108.60	108.69	231.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.26	3.55	0.00	0.00	16.70	20.38	0.00	0.00	0.00	38.88	38.88	48.74
Movement LOS	D	A			B	C				D	D	D
d_A, Approach Delay [s/veh]	16.25			17.70			0.00			43.73		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	20.32											
Intersection LOS	C											
Intersection V/C	0.712											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	21.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.699

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1133	552	418	1131	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1133	352	418	1131	0	107	10	249	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	283	88	105	283	0	27	3	62	0	0	0
Total Analysis Volume [veh/h]	0	1133	352	418	1131	0	107	10	249	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	14	0	6	14	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	43	0	34	77	0	0	23	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	45	45	26	74	18	18	
g / C, Green / Cycle	0.45	0.45	0.26	0.74	0.18	0.18	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.22	0.24	0.22	0.07	0.16	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1781	1583	
c, Capacity [veh/h]	3032	710	454	3774	314	279	
d1, Uniform Delay [s]	18.29	19.58	36.23	4.22	36.32	40.27	
k, delay calibration	0.50	0.50	0.29	0.50	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.35	2.47	18.04	0.20	0.74	9.68	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.37	0.50	0.92	0.30	0.37	0.89	
d, Delay for Lane Group [s/veh]	18.65	22.05	54.27	4.42	37.06	49.95	
Lane Group LOS	B	C	D	A	D	D	
Critical Lane Group	No	Yes	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	4.30	6.11	12.01	2.12	2.57	6.66	
50th-Percentile Queue Length [ft]	107.56	152.78	300.22	53.01	64.24	166.54	
95th-Percentile Queue Length [veh]	7.70	10.17	17.69	3.82	4.63	10.89	
95th-Percentile Queue Length [ft]	192.60	254.14	442.30	95.41	115.63	272.36	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	18.65	22.05	54.27	4.42	0.00	37.06	37.06	49.95	0.00	0.00	0.00
Movement LOS		B	C	D	A		D	D	D			
d_A, Approach Delay [s/veh]	19.45			17.88			45.83			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	21.57											
Intersection LOS	C											
Intersection V/C	0.699											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill PM.vistro
Report File: K:\...\1 - EX PM.pdf

Scenario 1 EX PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	WB Right	0.752	-	C
2	San Juan St / Red Hill Ave	Signalized	ICU 1	NB Thru	0.411	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	NB Thru	0.550	-	A
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	NB Thru	0.565	-	A
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.681	-	B
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	NB Thru	0.637	-	B
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	NB Right	0.575	-	A
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	NB Thru	0.736	-	C
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	NB Thru	0.598	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	158	802	111	127	515	84	43	412	117	114	1010	234
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	158	802	111	127	515	84	43	412	117	114	1010	234
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	201	28	32	129	21	11	103	29	29	253	59
Total Analysis Volume [veh/h]	158	802	111	127	515	84	43	412	117	114	1010	234
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.24	0.07	0.07	0.15	0.05	0.03	0.16	0.16	0.07	0.37	0.37
Intersection LOS	C											
Intersection V/C	0.752											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.411

Intersection Setup

Name	Red Hill Ave			Red Hill Ave								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave								
Base Volume Input [veh/h]	120	1059	93	49	655	23	14	75	68	91	58	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	1059	93	49	655	23	14	75	68	91	58	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	265	23	12	164	6	4	19	17	23	15	13
Total Analysis Volume [veh/h]	120	1059	93	49	655	23	14	75	68	91	58	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.23	0.23	0.03	0.13	0.13	0.01	0.05	0.04	0.05	0.09	0.03
Intersection LOS	A											
Intersection V/C	0.411											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.550

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	402	1195	245	31	715	115	74	169	179	168	271	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	402	1195	245	31	715	115	74	169	179	168	271	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	299	61	8	179	29	19	42	45	42	68	7
Total Analysis Volume [veh/h]	402	1195	245	31	715	115	74	169	179	168	271	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.23	0.14	0.02	0.16	0.16	0.04	0.10	0.11	0.10	0.18	0.18
Intersection LOS	A											
Intersection V/C	0.550											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.565

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	448
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	448
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	350	0	0	213	49	0	0	0	67	44	112
Total Analysis Volume [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	448
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.27	0.00	0.00	0.17	0.12	0.00	0.00	0.00	0.16	0.10	0.26
Intersection LOS	A											
Intersection V/C	0.565											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1419	442	327	794	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1419	442	327	794	0	303	1	250	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	355	111	82	199	0	76	0	63	0	0	0
Total Analysis Volume [veh/h]	0	1419	442	327	794	0	303	1	250	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.21	0.26	0.19	0.16	0.00	0.18	0.18	0.15	0.00	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.681											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	31	1489	28	142	815	84	228	101	27	48	102	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	1489	28	142	815	84	228	101	27	48	102	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	372	7	36	204	21	57	25	7	12	26	37
Total Analysis Volume [veh/h]	31	1489	28	142	815	84	228	101	27	48	102	146
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.22	0.22	0.08	0.16	0.05	0.13	0.08	0.08	0.03	0.15	0.15
Intersection LOS	B											
Intersection V/C	0.637											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	199	1344	63	150	617	86	120	88	73	39	115	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	199	1344	63	150	617	86	120	88	73	39	115	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	336	16	38	154	22	30	22	18	10	29	24
Total Analysis Volume [veh/h]	199	1344	63	150	617	86	120	88	73	39	115	96
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.28	0.28	0.09	0.14	0.14	0.07	0.12	0.04	0.02	0.09	0.06
Intersection LOS	A											
Intersection V/C	0.575											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	343	1370	125	161	448	122	103	289	124	236	672	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	343	1370	125	161	448	122	103	289	124	236	672	137
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	343	31	40	112	31	26	72	31	59	168	34
Total Analysis Volume [veh/h]	343	1370	125	161	448	122	103	289	124	236	672	137
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.29	0.29	0.09	0.11	0.11	0.06	0.12	0.12	0.07	0.24	0.24
Intersection LOS	C											
Intersection V/C	0.736											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	352	1862	101	87	561	83	142	51	118	44	30	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	352	1862	101	87	561	83	142	51	118	44	30	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	466	25	22	140	21	36	13	30	11	8	12
Total Analysis Volume [veh/h]	352	1862	101	87	561	83	142	51	118	44	30	48
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.38	0.38	0.05	0.13	0.13	0.08	0.03	0.07	0.03	0.02	0.03
Intersection LOS	A											
Intersection V/C	0.598											

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill_HCM_PM.vistro
Report File: K:\...\1 - EX PM_HCM.pdf

Scenario 1 EX PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.660	22.5	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	SB Left	0.642	22.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	448
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	85
Total Hourly Volume [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	363
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	350	0	0	213	49	0	0	0	67	44	91
Total Analysis Volume [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	363
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	18	0	0	14	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	28	57	0	0	29	0	0	0	0	0	43	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	20	66	42	42		26	26	26
g / C, Green / Cycle	0.20	0.66	0.42	0.42		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.18	0.28	0.17	0.12		0.12	0.12	0.23
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1843	1583
c, Capacity [veh/h]	360	3347	2113	659		462	480	412
d1, Uniform Delay [s]	38.90	8.00	20.46	19.44		31.20	31.13	35.49
k, delay calibration	0.17	0.50	0.50	0.50		0.11	0.11	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	12.27	0.39	0.57	1.16		0.76	0.71	8.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.90	0.42	0.40	0.30		0.47	0.47	0.88
d, Delay for Lane Group [s/veh]	51.17	8.38	21.03	20.60		31.96	31.84	44.06
Lane Group LOS	D	A	C	C		C	C	D
Critical Lane Group	Yes	No	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh]	8.92	4.34	4.65	3.21		4.51	4.60	9.31
50th-Percentile Queue Length [ft]	222.99	108.54	116.33	80.14		112.85	114.99	232.63
95th-Percentile Queue Length [veh]	13.82	7.76	8.19	5.77		8.00	8.12	14.31
95th-Percentile Queue Length [ft]	345.44	193.97	204.77	144.25		199.96	202.92	357.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.17	8.38	0.00	0.00	21.03	20.60	0.00	0.00	0.00	31.96	31.84	44.06
Movement LOS	D	A			C	C				C	C	D
d_A, Approach Delay [s/veh]	16.47			20.95			0.00			37.37		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	22.49											
Intersection LOS	C											
Intersection V/C	0.660											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1419	442	327	794	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1419	242	327	794	0	303	1	250	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	355	61	82	199	0	76	0	63	0	0	0
Total Analysis Volume [veh/h]	0	1419	242	327	794	0	303	1	250	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	5	5	0	0	5	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	40	0	31	71	0	0	29	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	48	48	20	72	20	20	
g / C, Green / Cycle	0.48	0.48	0.20	0.72	0.20	0.20	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.15	0.18	0.16	0.17	0.16	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1774	1583	
c, Capacity [veh/h]	3240	758	364	3674	348	310	
d1, Uniform Delay [s]	17.18	16.03	38.73	4.51	39.01	38.38	
k, delay calibration	0.50	0.50	0.17	0.50	0.14	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.43	1.11	11.69	0.14	8.50	4.92	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.44	0.32	0.90	0.22	0.87	0.81	
d, Delay for Lane Group [s/veh]	17.61	17.14	50.42	4.65	47.51	43.31	
Lane Group LOS	B	B	D	A	D	D	
Critical Lane Group	Yes	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh]	5.29	3.54	8.88	1.54	7.96	6.20	
50th-Percentile Queue Length [ft]	132.29	88.47	222.02	38.58	199.00	155.03	
95th-Percentile Queue Length [veh]	9.06	6.37	13.77	2.78	12.59	10.29	
95th-Percentile Queue Length [ft]	226.60	159.25	344.21	69.44	314.68	257.13	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	17.61	17.14	50.42	4.65	0.00	47.51	47.51	43.31	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	D			
d_A, Approach Delay [s/veh]	17.54			18.00			45.61			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.36											
Intersection LOS	C											
Intersection V/C	0.642											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX B-2

INTERSECTION ANALYSIS
WORKSHEETS –
EXISTING PLUS PROJECT
CONDITIONS

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill AM.vistro
Report File: K:\...\2 - EX WP AM.pdf

Scenario 2 EX WP AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	SB Thru	0.665	-	B
2	San Juan St / Red Hill Ave	Signalized	ICU 1	SB Right	0.537	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	SB Thru	0.717	-	C
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	SB Right	0.644	-	B
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.748	-	C
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	SB Thru	0.668	-	B
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	SB Thru	0.637	-	B
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	SB Right	0.691	-	B
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	SB Right	0.674	-	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	115	454	183	110	873	87	43	478	102	173	491	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	34	8	0	29	0	0	0	6	6	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	488	191	110	902	87	43	478	108	179	491	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	122	48	28	226	22	11	120	27	45	123	34
Total Analysis Volume [veh/h]	123	488	191	110	902	87	43	478	108	179	491	136
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.14	0.11	0.06	0.27	0.05	0.03	0.17	0.17	0.11	0.18	0.18
Intersection LOS	B											
Intersection V/C	0.665											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.537

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Base Volume Input [veh/h]	74	662	108	71	1084	64	40	89	125	213	57	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	50	5	0	41	0	0	0	8	4	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	712	113	71	1125	64	40	89	133	217	57	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	178	28	18	281	16	10	22	33	54	14	11
Total Analysis Volume [veh/h]	82	712	113	71	1125	64	40	89	133	217	57	43
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.16	0.16	0.04	0.23	0.23	0.02	0.08	0.08	0.13	0.16	0.03
Intersection LOS	A											
Intersection V/C	0.537											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.717

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	261	712	197	15	1289	60	83	166	184	266	193	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	133	21	10	179	10	7	0	13	24	0	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	269	845	218	25	1468	70	90	166	197	290	193	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	211	55	6	367	18	23	42	49	73	48	4
Total Analysis Volume [veh/h]	269	845	218	25	1468	70	90	166	197	290	193	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.17	0.13	0.01	0.30	0.30	0.05	0.10	0.12	0.17	0.12	0.12
Intersection LOS	C											
Intersection V/C	0.717											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	257
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	125	0	0	165	51	0	0	0	20	0	37
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	365	1076	0	0	1434	528	0	0	0	232	2	294
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	269	0	0	359	132	0	0	0	58	1	74
Total Analysis Volume [veh/h]	365	1076	0	0	1434	528	0	0	0	232	2	294
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	0	4	0	0	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.21	0.00	0.00	0.28	0.31	0.00	0.00	0.00	0.07	0.07	0.17
Intersection LOS	B											
Intersection V/C	0.644											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1133	552	418	1131	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	108	17	55	130	0	37	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1241	569	473	1261	0	144	10	269	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	310	142	118	315	0	36	3	67	0	0	0
Total Analysis Volume [veh/h]	0	1241	569	473	1261	0	144	10	269	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.18	0.33	0.28	0.25	0.00	0.08	0.09	0.16	0.00	0.00	0.00
Intersection LOS	C											
Intersection V/C	0.748											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.668

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	11	1196	22	152	1133	97	271	75	68	55	32	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	87	2	10	124	16	31	2	1	1	3	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	1283	24	162	1257	113	302	77	69	56	35	224
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	321	6	41	314	28	76	19	17	14	9	56
Total Analysis Volume [veh/h]	13	1283	24	162	1257	113	302	77	69	56	35	224
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.19	0.19	0.10	0.25	0.07	0.18	0.09	0.09	0.03	0.15	0.15
Intersection LOS	B											
Intersection V/C	0.668											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	73	761	20	83	1092	83	149	44	155	82	58	313
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	63	1	7	77	7	22	2	6	1	2	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	824	21	90	1169	90	171	46	161	83	60	319
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	206	5	23	292	23	43	12	40	21	15	80
Total Analysis Volume [veh/h]	88	824	21	90	1169	90	171	46	161	83	60	319
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.17	0.17	0.05	0.25	0.25	0.10	0.13	0.09	0.05	0.08	0.19
Intersection LOS	B											
Intersection V/C	0.637											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	131	527	137	124	1129	130	138	453	354	218	260	131
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	28	0	12	54	18	41	2	0	0	1	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	555	137	136	1183	148	179	455	354	218	261	141
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	139	34	34	296	37	45	114	89	55	65	35
Total Analysis Volume [veh/h]	133	555	137	136	1183	148	179	455	354	218	261	141
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.14	0.14	0.08	0.26	0.26	0.11	0.24	0.24	0.06	0.12	0.12
Intersection LOS	B											
Intersection V/C	0.691											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	99	456	27	48	1562	228	154	94	253	101	103	125
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	4	16	18	15	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	468	27	52	1578	246	169	94	253	101	103	128
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	117	7	13	395	62	42	24	63	25	26	32
Total Analysis Volume [veh/h]	99	468	27	52	1578	246	169	94	253	101	103	128
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.10	0.10	0.03	0.36	0.36	0.10	0.06	0.15	0.06	0.06	0.08
Intersection LOS	B											
Intersection V/C	0.674											

Red Hill Corridor SP

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Scenario 2 EX WP AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.788	22.4	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	SB Left	0.761	23.9	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	951	0	0	1269	477	0	0	0	212	2	257
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	125	0	0	165	51	0	0	0	20	0	37
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	50
Total Hourly Volume [veh/h]	365	1076	0	0	1434	528	0	0	0	232	2	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	269	0	0	359	132	0	0	0	58	1	61
Total Analysis Volume [veh/h]	365	1076	0	0	1434	528	0	0	0	232	2	244
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	0	0	0	0	0	5	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	32	74	0	0	42	0	0	0	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	23	74	48	48		18	18	18
g / C, Green / Cycle	0.23	0.74	0.48	0.48		0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.28	0.33		0.07	0.07	0.15
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1775	1583
c, Capacity [veh/h]	401	3770	2420	755		314	314	280
d1, Uniform Delay [s]	37.71	4.19	19.06	20.52		36.26	36.26	40.04
k, delay calibration	0.22	0.50	0.50	0.50		0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	14.70	0.19	1.07	5.33		0.73	0.73	8.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

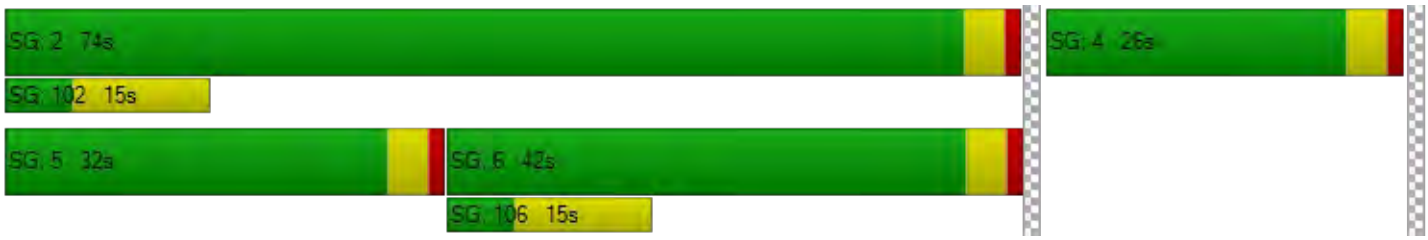
X, volume / capacity	0.91	0.29	0.59	0.70		0.37	0.37	0.87
d, Delay for Lane Group [s/veh]	52.41	4.38	20.14	25.85		36.99	36.99	48.23
Lane Group LOS	D	A	C	C		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh]	10.19	2.00	7.99	10.33		2.57	2.57	6.40
50th-Percentile Queue Length [ft]	254.87	49.97	199.71	258.22		64.16	64.21	160.07
95th-Percentile Queue Length [veh]	15.43	3.60	12.62	15.60		4.62	4.62	10.55
95th-Percentile Queue Length [ft]	385.79	89.95	315.59	389.99		115.49	115.58	263.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.41	4.38	0.00	0.00	20.14	25.85	0.00	0.00	0.00	36.99	36.99	48.23
Movement LOS	D	A			C	C				D	D	D
d_A, Approach Delay [s/veh]	16.55			21.68			0.00			42.73		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	22.36											
Intersection LOS	C											
Intersection V/C	0.788											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	23.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.761

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1133	552	418	1131	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	108	17	55	130	0	37	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1241	369	473	1261	0	144	10	269	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	310	92	118	315	0	36	3	67	0	0	0
Total Analysis Volume [veh/h]	0	1241	369	473	1261	0	144	10	269	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	14	0	6	14	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	43	0	34	77	0	0	23	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	41	41	28	73	19	19	
g / C, Green / Cycle	0.41	0.41	0.28	0.73	0.19	0.19	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.23	0.27	0.25	0.09	0.17	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1780	1583	
c, Capacity [veh/h]	2765	647	504	3718	333	296	
d1, Uniform Delay [s]	21.41	22.80	34.93	4.75	36.16	39.80	
k, delay calibration	0.50	0.50	0.37	0.50	0.11	0.13	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.53	3.62	22.24	0.25	1.00	12.21	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.45	0.57	0.94	0.34	0.46	0.91	
d, Delay for Lane Group [s/veh]	21.94	26.42	57.18	5.00	37.16	52.01	
Lane Group LOS	C	C	E	A	D	D	
Critical Lane Group	No	Yes	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	5.24	7.16	14.09	2.62	3.41	7.39	
50th-Percentile Queue Length [ft]	131.02	178.98	352.18	65.53	85.33	184.71	
95th-Percentile Queue Length [veh]	9.00	11.55	20.24	4.72	6.14	11.85	
95th-Percentile Queue Length [ft]	224.88	288.69	506.06	117.96	153.60	296.16	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	21.94	26.42	57.18	5.00	0.00	37.16	37.16	52.01	0.00	0.00	0.00
Movement LOS		C	C	E	A		D	D	D			
d_A, Approach Delay [s/veh]	22.97			19.23			46.60			0.00		
Approach LOS	C			B			D			A		
d_I, Intersection Delay [s/veh]	23.90											
Intersection LOS	C											
Intersection V/C	0.761											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Red Hill Corridor SP

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Scenario 2 EX WP PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	WB Right	0.774	-	C
2	San Juan St / Red Hill Ave	Signalized	ICU 1	NB Thru	0.443	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	NB Thru	0.655	-	B
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	NB Thru	0.701	-	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.826	-	D
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	NB Thru	0.766	-	C
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	NB Thru	0.665	-	B
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	NB Thru	0.835	-	D
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	NB Thru	0.637	-	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	158	802	111	127	515	84	43	412	117	114	1010	234
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	76	16	0	85	0	0	0	16	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	174	878	127	127	600	84	43	412	133	130	1010	234
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	220	32	32	150	21	11	103	33	33	253	59
Total Analysis Volume [veh/h]	174	878	127	127	600	84	43	412	133	130	1010	234
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.07	0.07	0.18	0.05	0.03	0.16	0.16	0.08	0.37	0.37
Intersection LOS	C											
Intersection V/C	0.774											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.443

Intersection Setup

Name	Red Hill Ave			Red Hill Ave								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave								
Base Volume Input [veh/h]	120	1059	93	49	655	23	14	75	68	91	58	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	108	13	0	117	0	0	0	22	14	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1167	106	49	772	23	14	75	90	105	58	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	292	27	12	193	6	4	19	23	26	15	13
Total Analysis Volume [veh/h]	140	1167	106	49	772	23	14	75	90	105	58	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.25	0.25	0.03	0.16	0.16	0.01	0.05	0.05	0.06	0.10	0.03
Intersection LOS	A											
Intersection V/C	0.443											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	402	1195	245	31	715	115	74	169	179	168	271	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	25	373	54	18	331	18	20	0	24	51	0	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	427	1568	299	49	1046	133	94	169	203	219	271	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	107	392	75	12	262	33	24	42	51	55	68	12
Total Analysis Volume [veh/h]	427	1568	299	49	1046	133	94	169	203	219	271	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.31	0.18	0.03	0.23	0.23	0.06	0.10	0.12	0.13	0.19	0.19
Intersection LOS	B											
Intersection V/C	0.655											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	448
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	62	352	0	0	318	88	0	0	0	62	0	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	388	1751	0	0	1170	285	0	0	0	328	177	548
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	438	0	0	293	71	0	0	0	82	44	137
Total Analysis Volume [veh/h]	388	1751	0	0	1170	285	0	0	0	328	177	548
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.34	0.00	0.00	0.23	0.17	0.00	0.00	0.00	0.19	0.10	0.32
Intersection LOS	C											
Intersection V/C	0.701											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.826

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1419	442	327	794	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	314	61	86	294	0	100	0	62	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1733	503	413	1088	0	403	1	312	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	433	126	103	272	0	101	0	78	0	0	0
Total Analysis Volume [veh/h]	0	1733	503	413	1088	0	403	1	312	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.25	0.30	0.24	0.21	0.00	0.24	0.24	0.18	0.00	0.00	0.00
Intersection LOS	D											
Intersection V/C	0.826											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.766

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	31	1489	28	142	815	84	228	101	27	48	102	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	243	3	18	289	49	112	9	4	4	9	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	1732	31	160	1104	133	340	110	31	52	111	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	433	8	40	276	33	85	28	8	13	28	42
Total Analysis Volume [veh/h]	34	1732	31	160	1104	133	340	110	31	52	111	166
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.26	0.26	0.09	0.22	0.08	0.20	0.08	0.08	0.03	0.16	0.16
Intersection LOS	C											
Intersection V/C	0.766											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	199	1344	63	150	617	86	120	88	73	39	115	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	156	3	13	178	13	77	7	18	3	7	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	241	1500	66	163	795	99	197	95	91	42	122	112
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	375	17	41	199	25	49	24	23	11	31	28
Total Analysis Volume [veh/h]	241	1500	66	163	795	99	197	95	91	42	122	112
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.31	0.31	0.10	0.18	0.18	0.12	0.17	0.05	0.02	0.10	0.07
Intersection LOS	B											
Intersection V/C	0.665											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.835

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	343	1370	125	161	448	122	103	289	124	236	672	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	71	0	27	129	43	101	3	0	0	4	29
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	353	1441	125	188	577	165	204	292	124	236	676	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	360	31	47	144	41	51	73	31	59	169	42
Total Analysis Volume [veh/h]	353	1441	125	188	577	165	204	292	124	236	676	166
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.31	0.31	0.11	0.15	0.15	0.12	0.12	0.12	0.07	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.835											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	352	1862	101	87	561	83	142	51	118	44	30	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	32	0	7	30	37	41	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	352	1894	101	94	591	120	183	51	118	44	30	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	474	25	24	148	30	46	13	30	11	8	14
Total Analysis Volume [veh/h]	352	1894	101	94	591	120	183	51	118	44	30	56
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.39	0.39	0.06	0.14	0.14	0.11	0.03	0.07	0.03	0.02	0.03
Intersection LOS	B											
Intersection V/C	0.637											

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill_HCM_PM.vistro
Report File: K:\...\2 - EX WP PM_HCM.pdf

Scenario 2 EX WP PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.843	27.9	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	EB Left	0.814	28.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.843

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	326	1399	0	0	852	197	0	0	0	266	177	448
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	62	352	0	0	318	88	0	0	0	62	0	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	85
Total Hourly Volume [veh/h]	388	1751	0	0	1170	285	0	0	0	328	177	463
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	438	0	0	293	71	0	0	0	82	44	116
Total Analysis Volume [veh/h]	388	1751	0	0	1170	285	0	0	0	328	177	463
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	18	0	0	14	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	28	57	0	0	29	0	0	0	0	0	43	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	23	60	32	32		32	32	32
g / C, Green / Cycle	0.23	0.60	0.32	0.32		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.22	0.35	0.23	0.18		0.14	0.14	0.29
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1835	1583
c, Capacity [veh/h]	417	3037	1641	512		570	590	509
d1, Uniform Delay [s]	37.45	12.31	29.75	27.91		26.83	26.69	32.53
k, delay calibration	0.25	0.50	0.50	0.50		0.11	0.11	0.28
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	18.36	0.80	2.67	4.32		0.54	0.49	14.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.58	0.71	0.56		0.44	0.43	0.91
d, Delay for Lane Group [s/veh]	55.81	13.11	32.42	32.23		27.37	27.18	46.95
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh]	11.25	7.59	8.46	6.14		4.79	4.76	12.49
50th-Percentile Queue Length [ft]	281.19	189.63	211.56	153.47		119.66	118.99	312.32
95th-Percentile Queue Length [veh]	16.75	12.10	13.23	10.20		8.37	8.34	18.29
95th-Percentile Queue Length [ft]	418.70	302.55	330.83	255.05		209.36	208.44	457.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.81	13.11	0.00	0.00	32.42	32.23	0.00	0.00	0.00	27.33	27.18	46.95
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	20.86			32.38			0.00			36.69		
Approach LOS	C			C			A			D		
d_I, Intersection Delay [s/veh]	27.89											
Intersection LOS	C											
Intersection V/C	0.843											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.814

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1419	442	327	794	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	314	61	86	294	0	100	0	62	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1733	303	413	1088	0	403	1	312	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	433	76	103	272	0	101	0	78	0	0	0
Total Analysis Volume [veh/h]	0	1733	303	413	1088	0	403	1	312	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	5	5	0	0	5	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	40	0	31	71	0	0	29	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	38	38	25	68	24	24	
g / C, Green / Cycle	0.38	0.38	0.25	0.68	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.26	0.19	0.23	0.21	0.23	0.20	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1774	1583	
c, Capacity [veh/h]	2596	607	446	3425	435	388	
d1, Uniform Delay [s]	25.54	23.49	36.53	6.73	36.90	35.49	
k, delay calibration	0.50	0.50	0.29	0.50	0.27	0.20	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.38	2.91	18.64	0.24	18.72	7.01	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.67	0.50	0.93	0.32	0.93	0.80	
d, Delay for Lane Group [s/veh]	26.92	26.40	55.18	6.97	55.62	42.50	
Lane Group LOS	C	C	E	A	E	D	
Critical Lane Group	Yes	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh]	8.53	5.82	11.96	2.91	11.72	7.79	
50th-Percentile Queue Length [ft]	213.21	145.44	299.02	72.81	293.12	194.63	
95th-Percentile Queue Length [veh]	13.32	9.77	17.63	5.24	17.34	12.36	
95th-Percentile Queue Length [ft]	332.94	244.33	440.81	131.06	433.51	309.03	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	26.92	26.40	55.18	6.97	0.00	55.62	55.62	42.50	0.00	0.00	0.00
Movement LOS		C	C	E	A		E	E	D			
d_A, Approach Delay [s/veh]	26.84			20.23			49.90			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.39											
Intersection LOS	C											
Intersection V/C	0.814											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX B-3

INTERSECTION ANALYSIS
WORKSHEETS –
LONG-RANGE FUTURE
WITHOUT PROJECT CONDITIONS

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill AM.vistro
Report File: K:\...\3 - BO AM_ADJ EX.pdf

Scenario 3 BO AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	EB Thru	0.741	-	C
2	San Juan St / Red Hill Ave	Signalized	ICU 1	SB Thru	0.568	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	SB Thru	0.812	-	D
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	SB Right	0.648	-	B
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.738	-	C
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	SB Thru	0.652	-	B
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	SB Thru	0.632	-	B
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	EB Thru	0.790	-	C
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	SB Thru	0.685	-	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	115	482	205	134	882	87	43	791	102	173	594	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	482	205	134	882	87	43	791	102	173	594	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	121	51	34	221	22	11	198	26	43	149	36
Total Analysis Volume [veh/h]	115	482	205	134	882	87	43	791	102	173	594	145
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.14	0.12	0.08	0.26	0.05	0.03	0.26	0.26	0.10	0.22	0.22
Intersection LOS	C											
Intersection V/C	0.741											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.568

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Base Volume Input [veh/h]	81	749	119	78	1201	70	44	98	138	234	63	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	749	119	78	1201	70	44	98	138	234	63	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	187	30	20	300	18	11	25	35	59	16	12
Total Analysis Volume [veh/h]	81	749	119	78	1201	70	44	98	138	234	63	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.17	0.17	0.05	0.25	0.25	0.03	0.08	0.08	0.14	0.17	0.03
Intersection LOS	A											
Intersection V/C	0.568											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.812

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	261	733	310	15	1298	60	83	325	184	388	371	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	261	733	310	15	1298	60	83	325	184	388	371	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	183	78	4	325	15	21	81	46	97	93	4
Total Analysis Volume [veh/h]	261	733	310	15	1298	60	83	325	184	388	371	14
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.14	0.18	0.01	0.27	0.27	0.05	0.19	0.11	0.23	0.23	0.23
Intersection LOS	D											
Intersection V/C	0.812											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	325
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	253	0	0	334	119	0	0	0	97	1	81
Total Analysis Volume [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	325
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	0	4	0	0	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.20	0.00	0.00	0.26	0.28	0.00	0.00	0.00	0.11	0.11	0.19
Intersection LOS	B											
Intersection V/C	0.648											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	295	138	128	321	0	27	3	62	0	0	0
Total Analysis Volume [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.17	0.32	0.30	0.25	0.00	0.06	0.07	0.15	0.00	0.00	0.00
Intersection LOS	C											
Intersection V/C	0.738											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	11	1217	22	152	1240	119	276	109	69	55	68	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1217	22	152	1240	119	276	109	69	55	68	217
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	304	6	38	310	30	69	27	17	14	17	54
Total Analysis Volume [veh/h]	11	1217	22	152	1240	119	276	109	69	55	68	217
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.18	0.18	0.09	0.24	0.07	0.16	0.10	0.10	0.03	0.17	0.17
Intersection LOS	B											
Intersection V/C	0.652											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	73	802	20	83	1228	83	167	110	155	82	135	313
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	802	20	83	1228	83	167	110	155	82	135	313
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	201	5	21	307	21	42	28	39	21	34	78
Total Analysis Volume [veh/h]	73	802	20	83	1228	83	167	110	155	82	135	313
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.16	0.16	0.05	0.26	0.26	0.10	0.16	0.09	0.05	0.13	0.18
Intersection LOS	B											
Intersection V/C	0.632											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.790

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	134	576	137	124	1158	130	138	698	354	339	295	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	134	576	137	124	1158	130	138	698	354	339	295	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	144	34	31	290	33	35	175	89	85	74	36
Total Analysis Volume [veh/h]	134	576	137	124	1158	130	138	698	354	339	295	145
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.14	0.14	0.07	0.25	0.25	0.08	0.31	0.31	0.10	0.13	0.13
Intersection LOS	C											
Intersection V/C	0.790											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	99	477	27	48	1611	261	232	94	253	101	103	125
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	477	27	48	1611	261	232	94	253	101	103	125
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	119	7	12	403	65	58	24	63	25	26	31
Total Analysis Volume [veh/h]	99	477	27	48	1611	261	232	94	253	101	103	125
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.10	0.10	0.03	0.37	0.37	0.14	0.06	0.15	0.06	0.06	0.07
Intersection LOS	B											
Intersection V/C	0.685											

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill_HCM_AM.vistro
Report File: K:\...\3 - BO AM_HCM.pdf

Scenario 3 BO AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.761	23.4	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	SB Left	0.758	24.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	23.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.761

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	325
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	50
Total Hourly Volume [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	275
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	253	0	0	334	119	0	0	0	97	1	69
Total Analysis Volume [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	275
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	0	0	0	0	0	5	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	32	74	0	0	42	0	0	0	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	21	72	47	47		20	20	20
g / C, Green / Cycle	0.21	0.72	0.47	0.47		0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.19	0.20	0.26	0.30		0.11	0.11	0.17
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1775	1583
c, Capacity [veh/h]	382	3674	2378	742		348	348	310
d1, Uniform Delay [s]	38.22	4.76	19.16	20.20		36.31	36.31	39.12
k, delay calibration	0.19	0.50	0.50	0.50		0.11	0.11	0.14
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	13.04	0.19	0.97	4.25		1.42	1.42	10.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

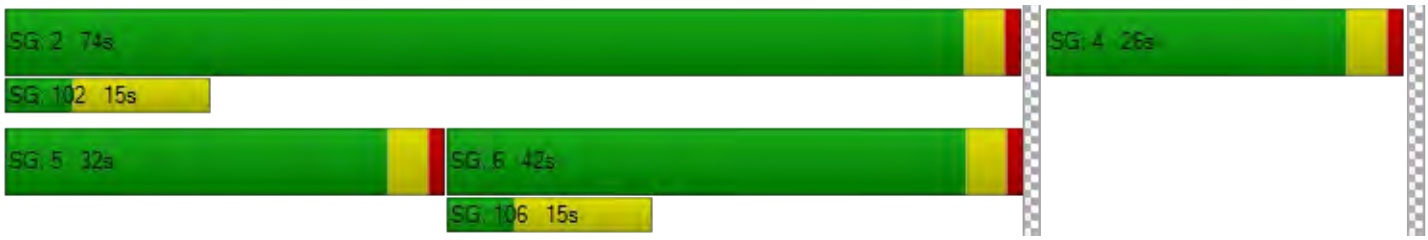
X, volume / capacity	0.90	0.28	0.56	0.64		0.56	0.56	0.89
d, Delay for Lane Group [s/veh]	51.26	4.94	20.13	24.45		37.73	37.73	49.71
Lane Group LOS	D	A	C	C		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh]	9.49	2.07	7.39	8.97		4.40	4.40	7.39
50th-Percentile Queue Length [ft]	237.20	51.85	184.73	224.31		109.95	109.99	184.69
95th-Percentile Queue Length [veh]	14.54	3.73	11.85	13.88		7.84	7.84	11.85
95th-Percentile Queue Length [ft]	363.49	93.32	296.18	347.12		195.93	195.99	296.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.26	4.94	0.00	0.00	20.13	24.45	0.00	0.00	0.00	37.73	37.73	49.71
Movement LOS	D	A			C	C				D	D	D
d_A, Approach Delay [s/veh]	16.73			21.26			0.00			42.68		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	23.37											
Intersection LOS	C											
Intersection V/C	0.761											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	24.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1178	352	510	1282	0	107	10	249	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	295	88	128	321	0	27	3	62	0	0	0
Total Analysis Volume [veh/h]	0	1178	352	510	1282	0	107	10	249	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	14	0	6	14	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	43	0	34	77	0	0	23	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	40	40	30	74	18	18	
g / C, Green / Cycle	0.40	0.40	0.30	0.74	0.18	0.18	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.22	0.29	0.25	0.07	0.16	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1781	1583	
c, Capacity [veh/h]	2728	639	532	3771	315	280	
d1, Uniform Delay [s]	21.56	22.89	34.38	4.41	36.27	40.21	
k, delay calibration	0.50	0.50	0.42	0.50	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.50	3.41	26.86	0.25	0.73	9.43	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.43	0.55	0.96	0.34	0.37	0.89	
d, Delay for Lane Group [s/veh]	22.06	26.30	61.25	4.66	37.00	49.64	
Lane Group LOS	C	C	E	A	D	D	
Critical Lane Group	No	Yes	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	4.97	6.79	15.82	2.50	2.57	6.64	
50th-Percentile Queue Length [ft]	124.28	169.84	395.61	62.62	64.21	166.07	
95th-Percentile Queue Length [veh]	8.63	11.07	22.35	4.51	4.62	10.87	
95th-Percentile Queue Length [ft]	215.69	276.71	558.71	112.72	115.58	271.74	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	22.06	26.30	61.25	4.66	0.00	37.00	37.00	49.64	0.00	0.00	0.00
Movement LOS		C	C	E	A		D	D	D			
d_A, Approach Delay [s/veh]	23.03			20.76			45.60			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	24.17											
Intersection LOS	C											
Intersection V/C	0.758											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Red Hill Corridor SP

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Report File: K:\...\3 - BO PM_ADJ EX.pdf

Scenario 3 BO PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	WB Thru	0.830	-	D
2	San Juan St / Red Hill Ave	Signalized	ICU 1	NB Thru	0.449	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	WB Thru	0.699	-	B
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	WB Right	0.644	-	B
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.827	-	D
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	NB Thru	0.718	-	C
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	NB Thru	0.657	-	B
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	NB Right	0.805	-	D
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	NB Thru	0.625	-	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.830

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	158	816	111	134	575	84	43	498	133	160	1215	268
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	158	816	111	134	575	84	43	498	133	160	1215	268
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	204	28	34	144	21	11	125	33	40	304	67
Total Analysis Volume [veh/h]	158	816	111	134	575	84	43	498	133	160	1215	268
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.24	0.07	0.08	0.17	0.05	0.03	0.19	0.19	0.09	0.44	0.44
Intersection LOS	D											
Intersection V/C	0.830											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.449

Intersection Setup

Name	Red Hill Ave			Red Hill Ave								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave								
Base Volume Input [veh/h]	132	1179	102	54	742	25	15	83	75	100	64	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	132	1179	102	54	742	25	15	83	75	100	64	57
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	295	26	14	186	6	4	21	19	25	16	14
Total Analysis Volume [veh/h]	132	1179	102	54	742	25	15	83	75	100	64	57
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.25	0.25	0.03	0.15	0.15	0.01	0.06	0.04	0.06	0.10	0.03
Intersection LOS	A											
Intersection V/C	0.449											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.699

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	487	1209	415	37	848	115	74	305	179	233	423	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	487	1209	415	37	848	115	74	305	179	233	423	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	122	302	104	9	212	29	19	76	45	58	106	7
Total Analysis Volume [veh/h]	487	1209	415	37	848	115	74	305	179	233	423	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.24	0.24	0.02	0.19	0.19	0.04	0.18	0.11	0.14	0.26	0.26
Intersection LOS	B											
Intersection V/C	0.699											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	527
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	527
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	366	0	0	252	49	0	0	0	87	44	132
Total Analysis Volume [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	527
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.29	0.00	0.00	0.20	0.12	0.00	0.00	0.00	0.20	0.10	0.31
Intersection LOS	B											
Intersection V/C	0.644											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.827

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	384	142	113	227	0	76	0	63	0	0	0
Total Analysis Volume [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.23	0.33	0.27	0.18	0.00	0.18	0.18	0.15	0.00	0.00	0.00
Intersection LOS	D											
Intersection V/C	0.827											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.718

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	31	1679	28	143	836	120	280	111	27	48	139	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	1679	28	143	836	120	280	111	27	48	139	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	420	7	36	209	30	70	28	7	12	35	37
Total Analysis Volume [veh/h]	31	1679	28	143	836	120	280	111	27	48	139	146
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.25	0.25	0.08	0.16	0.07	0.16	0.08	0.08	0.03	0.17	0.17
Intersection LOS	C											
Intersection V/C	0.718											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	199	1445	63	150	638	104	134	152	73	39	207	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	199	1445	63	150	638	104	134	152	73	39	207	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	361	16	38	160	26	34	38	18	10	52	24
Total Analysis Volume [veh/h]	199	1445	63	150	638	104	134	152	73	39	207	96
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.30	0.30	0.09	0.15	0.15	0.08	0.17	0.04	0.02	0.14	0.06
Intersection LOS	B											
Intersection V/C	0.657											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.805

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	343	1384	125	172	469	122	105	384	124	237	803	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	343	1384	125	172	469	122	105	384	124	237	803	203
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	346	31	43	117	31	26	96	31	59	201	51
Total Analysis Volume [veh/h]	343	1384	125	172	469	122	105	384	124	237	803	203
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.30	0.30	0.10	0.12	0.12	0.06	0.15	0.15	0.07	0.30	0.30
Intersection LOS	D											
Intersection V/C	0.805											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	403	1876	101	87	582	83	184	56	118	44	30	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	403	1876	101	87	582	83	184	56	118	44	30	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	469	25	22	146	21	46	14	30	11	8	12
Total Analysis Volume [veh/h]	403	1876	101	87	582	83	184	56	118	44	30	48
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.24	0.39	0.39	0.05	0.13	0.13	0.11	0.03	0.07	0.03	0.02	0.03
Intersection LOS	B											
Intersection V/C	0.625											

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill_HCM_PM.vistro
Report File: K:\...\3 - BO PM_HCM.pdf

Scenario 3 BO PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.752	25.1	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	SB Left	0.747	25.8	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	25.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	527
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	85
Total Hourly Volume [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	442
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	366	0	0	252	49	0	0	0	87	44	111
Total Analysis Volume [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	442
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	18	0	0	14	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	28	57	0	0	29	0	0	0	0	0	43	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	20	61	37	37		31	31	31
g / C, Green / Cycle	0.20	0.61	0.37	0.37		0.31	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.18	0.29	0.20	0.12		0.15	0.14	0.28
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1833	1583
c, Capacity [veh/h]	361	3099	1863	581		549	567	490
d1, Uniform Delay [s]	38.88	10.64	24.99	22.87		27.98	27.83	33.10
k, delay calibration	0.17	0.50	0.50	0.50		0.11	0.11	0.25
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	12.37	0.52	1.13	1.58		0.64	0.59	13.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.91	0.47	0.54	0.34		0.48	0.46	0.90
d, Delay for Lane Group [s/veh]	51.24	11.16	26.12	24.45		28.63	28.42	46.23
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh]	8.96	5.57	6.35	3.56		5.10	5.07	11.79
50th-Percentile Queue Length [ft]	223.89	139.28	158.79	88.96		127.43	126.76	294.67
95th-Percentile Queue Length [veh]	13.86	9.44	10.49	6.41		8.80	8.76	17.42
95th-Percentile Queue Length [ft]	346.58	236.05	262.13	160.13		220.00	219.08	435.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.24	11.16	0.00	0.00	26.12	24.45	0.00	0.00	0.00	28.58	28.42	46.23
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	18.48			25.85			0.00			36.64		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	25.15											
Intersection LOS	C											
Intersection V/C	0.752											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.747

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1534	367	451	906	0	303	1	250	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	384	92	113	227	0	76	0	63	0	0	0
Total Analysis Volume [veh/h]	0	1534	367	451	906	0	303	1	250	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	5	5	0	0	5	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	33	0	38	71	0	0	29	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	41	41	27	72	20	20	
g / C, Green / Cycle	0.41	0.41	0.27	0.72	0.20	0.20	
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.25	0.18	0.17	0.16	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1774	1583	
c, Capacity [veh/h]	2767	648	488	3674	348	310	
d1, Uniform Delay [s]	22.59	22.73	35.24	4.64	39.01	38.38	
k, delay calibration	0.50	0.50	0.27	0.50	0.14	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.81	3.57	16.40	0.16	8.50	4.92	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

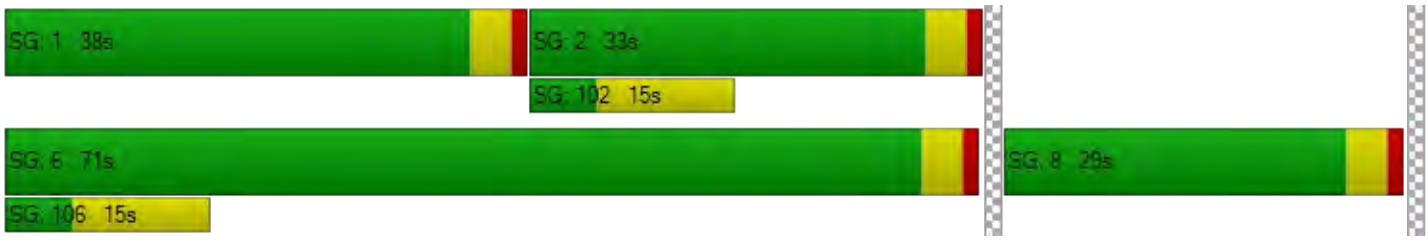
X, volume / capacity	0.55	0.57	0.92	0.25	0.87	0.81	
d, Delay for Lane Group [s/veh]	23.39	26.30	51.64	4.80	47.51	43.31	
Lane Group LOS	C	C	D	A	D	D	
Critical Lane Group	No	Yes	Yes	No	Yes	No	
50th-Percentile Queue Length [veh]	6.86	7.10	12.66	1.81	7.96	6.20	
50th-Percentile Queue Length [ft]	171.47	177.50	316.50	45.22	199.00	155.03	
95th-Percentile Queue Length [veh]	11.15	11.47	18.50	3.26	12.59	10.29	
95th-Percentile Queue Length [ft]	278.85	286.75	462.38	81.40	314.68	257.13	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	23.39	26.30	51.64	4.80	0.00	47.51	47.51	43.31	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	D			
d_A, Approach Delay [s/veh]	23.95			20.36			45.61			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	25.82											
Intersection LOS	C											
Intersection V/C	0.747											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX B-4

INTERSECTION ANALYSIS
WORKSHEETS –
LONG-RANGE FUTURE
WITH PROJECT CONDITIONS

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill AM.vistro
Report File: K:\...\4 - BO WP AM_ADJ EX.pdf

Scenario 4 BO WP AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	SB Thru	0.760	-	C
2	San Juan St / Red Hill Ave	Signalized	ICU 1	SB Thru	0.585	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	SB Right	0.866	-	D
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	SB Right	0.695	-	B
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.802	-	D
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	SB Thru	0.695	-	B
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	SB Right	0.674	-	B
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	EB Thru	0.806	-	D
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	SB Thru	0.703	-	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	115	482	205	134	882	87	43	791	102	173	594	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	34	8	0	29	0	0	0	6	6	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	516	213	134	911	87	43	791	108	179	594	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	129	53	34	228	22	11	198	27	45	149	36
Total Analysis Volume [veh/h]	123	516	213	134	911	87	43	791	108	179	594	145
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.15	0.13	0.08	0.27	0.05	0.03	0.26	0.26	0.11	0.22	0.22
Intersection LOS	C											
Intersection V/C	0.760											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			San Juan St			San Juan St		
Base Volume Input [veh/h]	81	749	119	78	1201	70	44	98	138	234	63	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	50	5	0	41	0	0	0	8	4	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	799	124	78	1242	70	44	98	146	238	63	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	200	31	20	311	18	11	25	37	60	16	12
Total Analysis Volume [veh/h]	89	799	124	78	1242	70	44	98	146	238	63	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.18	0.18	0.05	0.26	0.26	0.03	0.08	0.09	0.14	0.18	0.03
Intersection LOS	A											
Intersection V/C	0.585											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.866

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	261	733	310	15	1298	60	83	325	184	388	371	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	133	21	10	179	10	7	0	13	24	0	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	269	866	331	25	1477	70	90	325	197	412	371	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	217	83	6	369	18	23	81	49	103	93	5
Total Analysis Volume [veh/h]	269	866	331	25	1477	70	90	325	197	412	371	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.17	0.19	0.01	0.30	0.30	0.05	0.19	0.12	0.24	0.23	0.23
Intersection LOS	D											
Intersection V/C	0.866											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.695

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	325
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	125	0	0	165	51	0	0	0	20	0	37
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	365	1136	0	0	1502	528	0	0	0	408	2	362
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	284	0	0	376	132	0	0	0	102	1	91
Total Analysis Volume [veh/h]	365	1136	0	0	1502	528	0	0	0	408	2	362
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	0	4	0	0	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.22	0.00	0.00	0.29	0.31	0.00	0.00	0.00	0.12	0.12	0.21
Intersection LOS	B											
Intersection V/C	0.695											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	108	17	55	130	0	37	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1286	569	565	1412	0	144	10	269	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	322	142	141	353	0	36	3	67	0	0	0
Total Analysis Volume [veh/h]	0	1286	569	565	1412	0	144	10	269	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.19	0.33	0.33	0.28	0.00	0.08	0.09	0.16	0.00	0.00	0.00
Intersection LOS	D											
Intersection V/C	0.802											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.695

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	11	1217	22	152	1240	119	276	109	69	55	68	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	87	2	10	124	16	31	2	1	1	3	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	1304	24	162	1364	135	307	111	70	56	71	224
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	326	6	41	341	34	77	28	18	14	18	56
Total Analysis Volume [veh/h]	13	1304	24	162	1364	135	307	111	70	56	71	224
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.20	0.20	0.10	0.27	0.08	0.18	0.11	0.11	0.03	0.17	0.17
Intersection LOS	B											
Intersection V/C	0.695											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	73	802	20	83	1228	83	167	110	155	82	135	313
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	63	1	7	77	7	22	2	6	1	2	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	865	21	90	1305	90	189	112	161	83	137	319
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	216	5	23	326	23	47	28	40	21	34	80
Total Analysis Volume [veh/h]	88	865	21	90	1305	90	189	112	161	83	137	319
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.17	0.17	0.05	0.27	0.27	0.11	0.18	0.09	0.05	0.13	0.19
Intersection LOS	B											
Intersection V/C	0.674											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.806

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	134	576	137	124	1158	130	138	698	354	339	295	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	28	0	12	54	18	41	2	0	0	1	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	136	604	137	136	1212	148	179	700	354	339	296	155
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	151	34	34	303	37	45	175	89	85	74	39
Total Analysis Volume [veh/h]	136	604	137	136	1212	148	179	700	354	339	296	155
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.15	0.15	0.08	0.27	0.27	0.11	0.31	0.31	0.10	0.13	0.13
Intersection LOS	D											
Intersection V/C	0.806											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	99	477	27	48	1611	261	232	94	253	101	103	125
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	4	16	18	15	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	489	27	52	1627	279	247	94	253	101	103	128
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	122	7	13	407	70	62	24	63	25	26	32
Total Analysis Volume [veh/h]	99	489	27	52	1627	279	247	94	253	101	103	128
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.10	0.10	0.03	0.37	0.37	0.15	0.06	0.15	0.06	0.06	0.08
Intersection LOS	C											
Intersection V/C	0.703											

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill_HCM_AM.vistro
Report File: K:\...\4 - BO WP AM_HCM.pdf

Scenario 4 BO WP AM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	WB Right	0.837	25.9	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	SB Left	0.820	29.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.837

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	345	1011	0	0	1337	477	0	0	0	388	2	325
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	125	0	0	165	51	0	0	0	20	0	37
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	50
Total Hourly Volume [veh/h]	365	1136	0	0	1502	528	0	0	0	408	2	312
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	284	0	0	376	132	0	0	0	102	1	78
Total Analysis Volume [veh/h]	365	1136	0	0	1502	528	0	0	0	408	2	312
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	0	0	0	0	0	5	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	32	74	0	0	42	0	0	0	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	23	71	44	44		21	21	21
g / C, Green / Cycle	0.23	0.71	0.44	0.44		0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.30	0.33		0.12	0.12	0.20
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1775	1583
c, Capacity [veh/h]	402	3578	2224	694		381	381	340
d1, Uniform Delay [s]	37.64	5.60	22.40	23.66		34.84	34.84	38.38
k, delay calibration	0.22	0.50	0.50	0.50		0.11	0.11	0.20
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	14.37	0.23	1.66	7.69		1.18	1.18	16.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

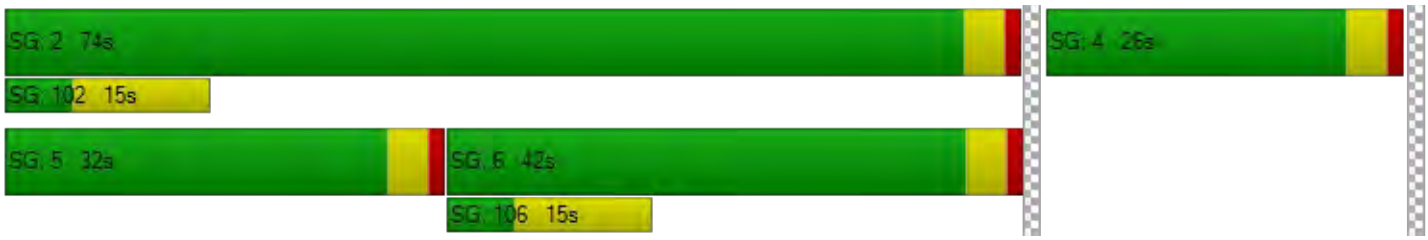
X, volume / capacity	0.91	0.32	0.68	0.76		0.54	0.54	0.92
d, Delay for Lane Group [s/veh]	52.01	5.84	24.07	31.36		36.02	36.02	54.57
Lane Group LOS	D	A	C	C		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh]	10.16	2.67	9.37	11.54		4.51	4.51	8.88
50th-Percentile Queue Length [ft]	254.00	66.65	234.28	288.50		112.77	112.81	222.11
95th-Percentile Queue Length [veh]	15.39	4.80	14.39	17.11		7.99	8.00	13.77
95th-Percentile Queue Length [ft]	384.69	119.97	359.79	427.78		199.85	199.90	344.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.01	5.84	0.00	0.00	24.07	31.36	0.00	0.00	0.00	36.02	36.02	54.57
Movement LOS	D	A			C	C				D	D	D
d_A, Approach Delay [s/veh]	17.07			25.96			0.00			44.04		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	25.89											
Intersection LOS	C											
Intersection V/C	0.837											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.820

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	108	17	55	130	0	37	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1286	369	565	1412	0	144	10	269	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	322	92	141	353	0	36	3	67	0	0	0
Total Analysis Volume [veh/h]	0	1286	369	565	1412	0	144	10	269	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	14	0	6	14	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	43	0	34	77	0	0	23	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	30	73	19	19	
g / C, Green / Cycle	0.39	0.39	0.30	0.73	0.19	0.19	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.23	0.32	0.28	0.09	0.17	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1780	1583	
c, Capacity [veh/h]	2656	622	532	3717	334	297	
d1, Uniform Delay [s]	22.78	24.06	35.00	4.96	36.14	39.77	
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.13	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.63	4.14	56.24	0.30	1.00	12.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.48	0.59	1.06	0.38	0.46	0.91	
d, Delay for Lane Group [s/veh]	23.42	28.20	91.24	5.25	37.13	51.82	
Lane Group LOS	C	C	F	A	D	D	
Critical Lane Group	No	Yes	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	5.67	7.44	20.90	3.06	3.41	7.38	
50th-Percentile Queue Length [ft]	141.68	186.04	522.62	76.52	85.31	184.41	
95th-Percentile Queue Length [veh]	9.57	11.92	29.50	5.51	6.14	11.83	
95th-Percentile Queue Length [ft]	239.28	297.88	737.59	137.74	153.56	295.76	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	23.42	28.20	91.24	5.25	0.00	37.13	37.13	51.82	0.00	0.00	0.00
Movement LOS		C	C	F	A		D	D	D			
d_A, Approach Delay [s/veh]	24.48			29.83			46.48			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.38											
Intersection LOS	C											
Intersection V/C	0.820											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Red Hill Corridor SP

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Report File: K:\...\4 - BO WP PM_ADJ EX.pdf

Scenario 4 BO WP PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bryan Ave / Red Hill Ave	Signalized	ICU 1	WB Thru	0.853	-	D
2	San Juan St / Red Hill Ave	Signalized	ICU 1	NB Thru	0.481	-	A
3	El Camino Real / Red Hill Ave	Signalized	ICU 1	NB Thru	0.804	-	D
4	I-15 NB Ramps / Red Hill Ave	Signalized	ICU 1	WB Right	0.659	-	B
5	I-15 SB Ramps / Red Hill Ave	Signalized	ICU 1	NB Right	0.972	-	E
6	Red Hill Ave / Nisson Rd	Signalized	ICU 1	NB Thru	0.847	-	D
7	Red Hill Ave / Mitchell Ave	Signalized	ICU 1	NB Thru	0.747	-	C
8	Red Hill Ave / Walnut Ave	Signalized	ICU 1	NB Thru	0.904	-	E
9	Red Hill Ave / Sycamore Ave	Signalized	ICU 1	NB Thru	0.665	-	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Bryan Ave / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.853

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Bryan Ave			Bryan Ave		
Base Volume Input [veh/h]	158	816	111	134	575	84	43	498	133	160	1215	268
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	76	16	0	85	0	0	0	16	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	174	892	127	134	660	84	43	498	149	176	1215	268
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	223	32	34	165	21	11	125	37	44	304	67
Total Analysis Volume [veh/h]	174	892	127	134	660	84	43	498	149	176	1215	268
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.07	0.08	0.19	0.05	0.03	0.19	0.19	0.10	0.44	0.44
Intersection LOS	D											
Intersection V/C	0.853											

Intersection Level Of Service Report
Intersection 2: San Juan St / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.481

Intersection Setup

Name	Red Hill Ave			Red Hill Ave								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave								
Base Volume Input [veh/h]	132	1179	102	54	742	25	15	83	75	100	64	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	108	13	0	117	0	0	0	22	14	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	152	1287	115	54	859	25	15	83	97	114	64	57
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	322	29	14	215	6	4	21	24	29	16	14
Total Analysis Volume [veh/h]	152	1287	115	54	859	25	15	83	97	114	64	57
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.27	0.27	0.03	0.17	0.17	0.01	0.06	0.06	0.07	0.10	0.03
Intersection LOS	A											
Intersection V/C	0.481											

Intersection Level Of Service Report
Intersection 3: El Camino Real / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.804

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			El Camino Real			El Camino Real		
Base Volume Input [veh/h]	487	1209	415	37	848	115	74	305	179	233	423	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	25	373	54	18	331	18	20	0	24	51	0	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	512	1582	469	55	1179	133	94	305	203	284	423	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	128	396	117	14	295	33	24	76	51	71	106	12
Total Analysis Volume [veh/h]	512	1582	469	55	1179	133	94	305	203	284	423	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.31	0.28	0.03	0.26	0.26	0.06	0.18	0.12	0.17	0.28	0.28
Intersection LOS	D											
Intersection V/C	0.804											

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.659

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	527
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	62	352	0	0	318	88	0	0	0	62	0	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	389	1814	0	0	1326	285	0	0	0	408	177	627
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	454	0	0	332	71	0	0	0	102	44	157
Total Analysis Volume [veh/h]	389	1814	0	0	1326	285	0	0	0	408	177	627
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.36	0.00	0.00	0.26	0.17	0.00	0.00	0.00	0.12	0.17	0.37
Intersection LOS	B											
Intersection V/C	0.659											

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.972

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	314	61	86	294	0	100	0	62	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1848	628	537	1200	0	403	1	312	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	462	157	134	300	0	101	0	78	0	0	0
Total Analysis Volume [veh/h]	0	1848	628	537	1200	0	403	1	312	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.27	0.37	0.32	0.24	0.00	0.24	0.24	0.18	0.00	0.00	0.00
Intersection LOS	E											
Intersection V/C	0.972											

Intersection Level Of Service Report
Intersection 6: Red Hill Ave / Nisson Rd

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.847

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Nisson Rd			Nisson Rd		
Base Volume Input [veh/h]	31	1679	28	143	836	120	280	111	27	48	139	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	243	3	18	289	49	112	9	4	4	9	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	1922	31	161	1125	169	392	120	31	52	148	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	481	8	40	281	42	98	30	8	13	37	42
Total Analysis Volume [veh/h]	34	1922	31	161	1125	169	392	120	31	52	148	166
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.29	0.29	0.09	0.22	0.10	0.23	0.09	0.09	0.03	0.18	0.18
Intersection LOS	D											
Intersection V/C	0.847											

Intersection Level Of Service Report
Intersection 7: Red Hill Ave / Mitchell Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.747

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Mitchell Ave			Mitchell Ave		
Base Volume Input [veh/h]	199	1445	63	150	638	104	134	152	73	39	207	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	156	3	13	178	13	77	7	18	3	7	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	241	1601	66	163	816	117	211	159	91	42	214	112
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	400	17	41	204	29	53	40	23	11	54	28
Total Analysis Volume [veh/h]	241	1601	66	163	816	117	211	159	91	42	214	112
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.33	0.33	0.10	0.18	0.18	0.12	0.22	0.05	0.02	0.15	0.07
Intersection LOS	C											
Intersection V/C	0.747											

Intersection Level Of Service Report
Intersection 8: Red Hill Ave / Walnut Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.904

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Walnut Ave			Walnut Ave		
Base Volume Input [veh/h]	343	1384	125	172	469	122	105	384	124	237	803	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	71	0	27	129	43	101	3	0	0	4	29
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	353	1455	125	199	598	165	206	387	124	237	807	232
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	364	31	50	150	41	52	97	31	59	202	58
Total Analysis Volume [veh/h]	353	1455	125	199	598	165	206	387	124	237	807	232
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.31	0.31	0.12	0.15	0.15	0.12	0.15	0.15	0.07	0.31	0.31
Intersection LOS	E											
Intersection V/C	0.904											

Intersection Level Of Service Report
Intersection 9: Red Hill Ave / Sycamore Ave

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			Sycamore Ave			Sycamore Ave		
Base Volume Input [veh/h]	403	1876	101	87	582	83	184	56	118	44	30	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	32	0	7	30	37	41	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	403	1908	101	94	612	120	225	56	118	44	30	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	477	25	24	153	30	56	14	30	11	8	14
Total Analysis Volume [veh/h]	403	1908	101	94	612	120	225	56	118	44	30	56
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	3	8	0	7	4	0	0	6	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.24	0.39	0.39	0.06	0.14	0.14	0.13	0.03	0.07	0.03	0.02	0.03
Intersection LOS	B											
Intersection V/C	0.665											

Red Hill Corridor SP

Vistro File: K:\..._Tustin Red Hill_HCM_PM.vistro
Report File: K:\...\4 - BO WP PM_HCM.pdf

Scenario 4 BO WP PM
1/22/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	I-15 NB Ramps / Red Hill Ave	Signalized	HCM 2010	NB Left	0.935	34.2	C
5	I-15 SB Ramps / Red Hill Ave	Signalized	HCM 2010	EB Left	0.913	34.7	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: I-15 NB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	34.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.935

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 NB Ramps			I-5 NB Ramps		
Base Volume Input [veh/h]	327	1462	0	0	1008	197	0	0	0	346	177	527
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	62	352	0	0	318	88	0	0	0	62	0	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	85
Total Hourly Volume [veh/h]	389	1814	0	0	1326	285	0	0	0	408	177	542
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	454	0	0	332	71	0	0	0	102	44	136
Total Analysis Volume [veh/h]	389	1814	0	0	1326	285	0	0	0	408	177	542
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	18	0	0	14	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	28	57	0	0	29	0	0	0	0	0	43	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	0	0	0	10	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	24	55	28	28		37	37	37
g / C, Green / Cycle	0.24	0.55	0.28	0.28		0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.22	0.36	0.26	0.18		0.16	0.16	0.34
s, saturation flow rate [veh/h]	1774	5074	5074	1583		1774	1827	1583
c, Capacity [veh/h]	418	2812	1413	441		649	668	579
d1, Uniform Delay [s]	37.41	15.47	35.23	31.74		24.08	23.94	30.58
k, delay calibration	0.25	0.50	0.50	0.50		0.11	0.11	0.37
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	18.38	1.16	13.13	7.14		0.49	0.45	19.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.65	0.94	0.65		0.45	0.44	0.94
d, Delay for Lane Group [s/veh]	55.79	16.62	48.37	38.87		24.57	24.40	50.46
Lane Group LOS	E	B	D	D		C	C	D
Critical Lane Group	Yes	No	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh]	11.28	9.23	11.97	6.83		5.25	5.22	15.35
50th-Percentile Queue Length [ft]	281.95	230.69	299.35	170.77		131.33	130.49	383.80
95th-Percentile Queue Length [veh]	16.79	14.21	17.65	11.12		9.01	8.97	21.78
95th-Percentile Queue Length [ft]	419.64	355.23	441.22	277.93		225.31	224.16	544.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.79	16.62	0.00	0.00	48.37	38.87	0.00	0.00	0.00	24.52	24.40	50.46
Movement LOS	E	B			D	D				C	C	D
d_A, Approach Delay [s/veh]	23.54			46.69			0.00			36.98		
Approach LOS	C			D			A			D		
d_I, Intersection Delay [s/veh]	34.15											
Intersection LOS	C											
Intersection V/C	0.935											

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: I-15 SB Ramps / Red Hill Ave

Control Type:	Signalized	Delay (sec / veh):	34.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.913

Intersection Setup

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Base Volume Input [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	314	61	86	294	0	100	0	62	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	200	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1848	428	537	1200	0	403	1	312	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	462	107	134	300	0	101	0	78	0	0	0
Total Analysis Volume [veh/h]	0	1848	428	537	1200	0	403	1	312	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	5	5	0	0	5	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	33	0	38	71	0	0	29	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	32	32	32	68	24	24	
g / C, Green / Cycle	0.32	0.32	0.32	0.68	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.27	0.27	0.30	0.24	0.23	0.20	
s, saturation flow rate [veh/h]	6765	1583	1774	5074	1774	1583	
c, Capacity [veh/h]	2128	498	568	3425	435	388	
d1, Uniform Delay [s]	32.32	32.19	33.12	6.92	36.90	35.49	
k, delay calibration	0.50	0.50	0.38	0.50	0.27	0.20	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	5.13	17.33	21.73	0.28	18.72	7.01	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

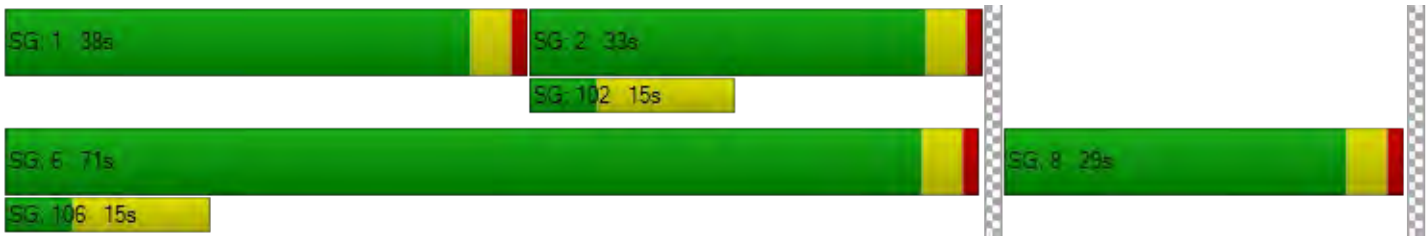
X, volume / capacity	0.87	0.86	0.94	0.35	0.93	0.80	
d, Delay for Lane Group [s/veh]	37.45	49.53	54.85	7.20	55.62	42.50	
Lane Group LOS	D	D	D	A	E	D	
Critical Lane Group	Yes	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh]	11.02	11.86	15.76	3.31	11.72	7.79	
50th-Percentile Queue Length [ft]	275.41	296.60	393.92	82.67	293.12	194.63	
95th-Percentile Queue Length [veh]	16.46	17.51	22.27	5.95	17.34	12.36	
95th-Percentile Queue Length [ft]	411.50	437.82	556.67	148.81	433.51	309.03	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	37.45	49.53	54.85	7.20	0.00	55.62	55.62	42.50	0.00	0.00	0.00
Movement LOS		D	D	D	A		E	E	D			
d_A, Approach Delay [s/veh]	39.72			21.93			49.90			0.00		
Approach LOS	D			C			D			A		
d_I, Intersection Delay [s/veh]	34.73											
Intersection LOS	C											
Intersection V/C	0.913											

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX B-5

INTERSECTION ANALYSIS
WORKSHEETS –
MITIGATIONS

Option 1: Restripe 2nd EB Lane to a Shared LTR

Number	5											
Intersection	I-15 SB Ramps / Red Hill Ave											
Control Type	Signalized											
Analysis Method	ICU 1											
Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	0	1178	552	510	1282	0	107	10	249	0	0	0
Total Analysis Volume [veh/h]	0	1286	569	565	1412	0	144	10	269	0	0	0

Intersection Settings

Cycle Length [s]	100											
Lost time [s]	5.00											
Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
so, Base Saturation Flow per Lane [veh/h/ln]	1700		1700	1700		1700	1700					

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.19	0.33	0.33	0.28	0.00	0.04	0.12	0.12	0.00	0.00	0.00
Critical Movement		No	Yes	Yes	No		Yes	No	No			
Intersection LOS	C											
Intersection V/C	0.759											

Option 1: Restripe 2nd EB Lane to a Shared LTR

Number	5											
Intersection	I-15 SB Ramps / Red Hill Ave											
Control Type	Signalized											
Analysis Method	ICU 1											
Name	Red Hill Ave			Red Hill Ave			I-5 SB Ramps			I-5 SB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	0	1534	567	451	906	0	303	1	250	0	0	0
Total Analysis Volume [veh/h]	0	1848	628	537	1200	0	403	1	312	0	0	0

Intersection Settings

Cycle Length [s]	100											
Lost time [s]	5.00											
Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
so, Base Saturation Flow per Lane [veh/h/ln]	1700		1700	1700		1700	1700					

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.27	0.37	0.32	0.24	0.00	0.12	0.21	0.21	0.00	0.00	0.00
Critical Movement		No	Yes	Yes	No		Yes	No	No			
Intersection LOS	D											
Intersection V/C	0.854											

APPENDIX **C**

RED HILL AVENUE SPECIFIC PLAN
EXHIBIT 4-3: CIRCULATION PLAN

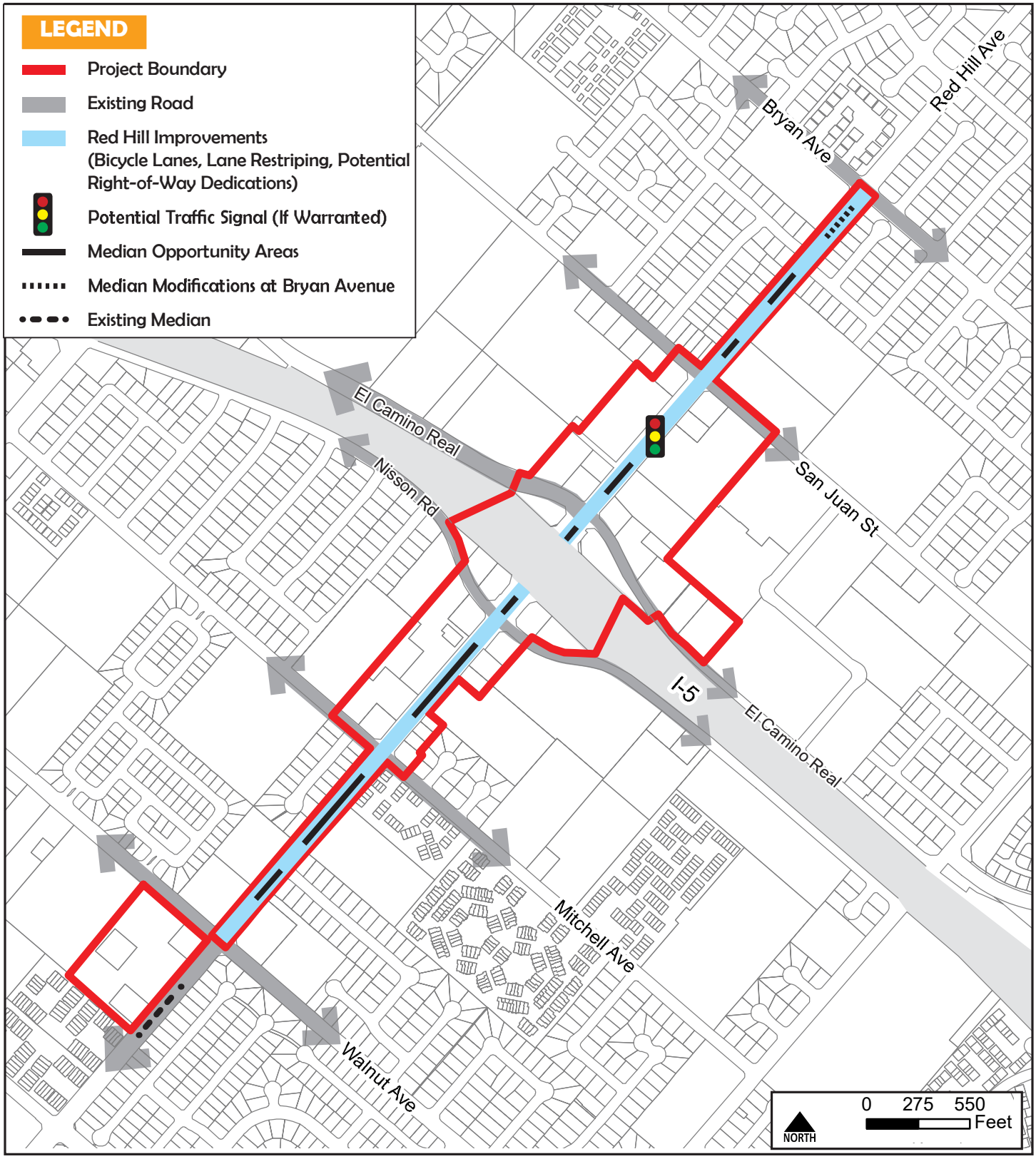


Exhibit 4-3: Circulation Plan

APPENDIX G

WATER SUPPLY ANALYSIS

Inter-Com

DATE: AUGUST 11, 2017

TO: ERICA H. DEMKOWICZ, AICP SENIOR PLANNER

FROM: ART VALENZUELA, WATER SERVICES MANAGER

SUBJECT: RED HILL SPECIFIC PLAN WATER SUPPLY ANALYSIS

Per your request, our staff has reviewed the City's 2015 Urban Water Management Plan and the City's master planning documents in relation to the existing and planned uses in the Red Hill Avenue Specific Plan area. Based on the draft Specific Plan, the study area includes approximately 296,446 square feet (sf) of existing commercial uses and a small number of residential units. The proposed project would add 500 multi-family dwelling units and 325,000 sf of commercial uses to this existing baseline development over a long term basis.

Urban Water Management Plan

The Water Services Department provides potable water service to most of the incorporated area of the City, inclusive of the Red Hill Avenue Specific Plan study area.

The City receives its water from two main sources; local well water from the Lower Santa Ana River Groundwater basin (OC Basin), which is managed by the Orange County Water District (OCWD) and imported water from the Municipal Water District of Orange County (MWDOC) through East Orange County Water District (EOCWD). MWDOC is Orange County's wholesale supplier and is a member agency of the Metropolitan Water District of Southern California (Metropolitan)[1].

The City receives approximately 74 percent of its water from underlying groundwater in the OC Basin. The remaining 26 percent is imported water purchased from EOCWD.

The City has eight untreated or "clear" groundwater wells that pump directly into the distribution system and two treatment facilities that treat groundwater from five additional wells. Elevations in the City's service area are approximately 210 feet above mean sea level (msl). The water system is divided into three pressure zones. The existing storage system consists of six reservoirs with a combined storage capacity of approximately 13.83 million gallons (MG).

The Urban Water Management Plan was updated in 2015 and identifies water demand through year 2040 and the available water supply. The City water use per capita per day in

[1] As the regional wholesale supplier for much of Orange County, MWDOC works in collaboration with each of its retail agencies as well as Metropolitan, its wholesaler, to develop demand projections for imported water.

2015 was 122 gallons; in 2015, the City delivered 11,113 acre-feet (AF) of water. The City's 2015 Urban Water Management Plan estimates that water demands will grow to 12,238 AF per year by 2040, which will be met by an increase in groundwater pumping and a reduction in reliance on imported supplies (UWMP 2015).

The reliability of water sources is addressed in the Urban Water Management Plan, Chapter 3, *Water Sources and Supply Reliability*. As discussed, the City's groundwater comes from the OC Basin, which is not adjudicated. Each year, OCWD sets a Basin Production Percentage (BPP). The BPP targets the amount of groundwater to be produced from the groundwater basin during the year as a percentage of the total water demands. Therefore, OCWD sets the City's groundwater pumping and the allocation is based on the City's demands. As discussed in detail in the Urban Water Management Plan, groundwater levels are managed within a safe basin operating range to protect the long-term sustainability of the OC Basin and to protect against land subsidence. Currently 8,200 AFY of the City's supplies come from the groundwater. The City's groundwater allocation supplemented by its imported water allocation. Although the City currently has a minimum available imported water supply of 12,401 AFY from MWDOC, it only utilizes 2,914 AFY annually from imported water supplies[2].

Based on the City's water use per day in 2015 of 122 gallons per capita, the Specific Plan's estimated 1,520 residents and 722 employees would generate an additional water demand of 273,524 gallons per day or 306 acre-feet per year (AFY) compared to existing conditions.

As described in detail in Chapter 3, *Water Sources and Supply Reliability,* the City's water demand and supply is estimated to grow from 11,113 AFY to 12,238 AFY by 2040, which is an increase of 1,125 AFY for normal year. For single and multiple dry years, demand and supply would be 12,972 AFY, an increase of 1,859 AFY over existing conditions. At buildout and full occupancy of the proposed Specific Plan, the project would generate a demand of 306 AFY, which would be within the anticipated increase in demand and supply of water assumed in the Urban Water Management Plan for 2040 for normal year and multiple dry years.

The Red Hill Specific Plan accommodates the projected growth within the City. Buildout of the proposed Specific Plan would be served from existing entitlements and new or expanded water entitlements would not be needed due to diversified supply and conservation measures. The City is capable of meeting all customers' demands within its service area through the purchase of significant reserves held by Metropolitan, local groundwater supplies, and through implementation of conservation measures in multiple dry years from 2020 through 2040. Furthermore, the City's water supply is reliable, and is addressed in UWMP Chapter 3, *Water Sources and Supply Reliability;* its water shortage plan is addressed in Chapter 5, *Water Shortage Contingency Plan.*

As demonstrated by the City's 2015 Urban Water Management Plan, the proposed growth in the Red Hill study area falls within the assumptions made for growth in the City through 2040 and sufficient water supply exists to serve the proposed uses identified in the Red Hill Specific Plan.

[2] As shown in UWMP Table 5-2*, Retail: Minimum Supply Next Three Years*.