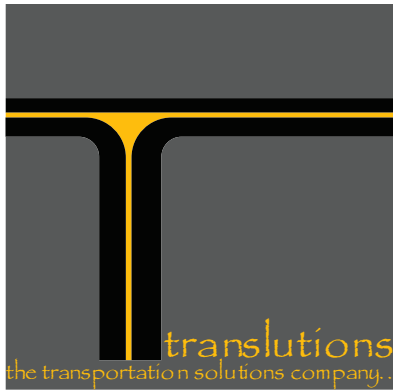

Appendix E

VMT Analysis



memorandum

DATE: April 3, 2024
TO: Sabita Tewani, AICP, PTP
FROM: Sandipan Bhattacharjee, P.E., T.E., AICP, ENV-SP
SUBJECT: VMT Methodology & Outputs for Fullerton Housing Incentive Overlay Zone Program, City of Fullerton

This memorandum describes the analysis methodology and findings of the proposed Fullerton Housing Incentive Overlay Zone Program. The City of Fullerton's Housing Incentive Overlay Zone (HIOZ) Program (Project) would facilitate housing unit production by allowing housing development on properties with non-residential underlying zoning classifications in exchange for providing a specified percentage of affordable housing units. The Program is identified within the City's Housing Element for the planning period of October 2021 through October 2029 as an implementation program to meet the Regional Housing Needs Assessment goal of 13,209 units by 2029.

The Program would apply an overlay zone to approximately 759 parcels across the City totaling 593 acres. Under existing conditions, these parcels are currently zoned for non-residential uses, however, can accommodate new housing development. Implementation of the Program could theoretically result in a buildout potential of 35,611 units. The Program would not directly result in the construction of the total buildout potential. Rather, the Program would facilitate the construction of housing units with the adoption of this overlay zone.

TRANSPORTATION MODEL

The Orange County Transportation Analysis Model (OCTAM) Version 5.0 was used for the analysis. The OCTAM's Base Year is 2016 and the Horizon Year is 2045. The OCTAM has 3142 Traffic Analysis Zones (TAZs), of which 1741 are in Orange County. The City of Fullerton includes 75 TAZs in the OCTAM.

MODEL SOCIOECONOMIC DATA (SED)

The project area consists of most TAZs within the City. Since it is a planning level analysis, the additive method¹ for project data was used for the analysis. Under this method, project related SED was added to the existing (or future) SED of the TAZs to evaluate with project VMT. Appendix A shows the changes to the model SED by TAZ as well as the project related SED.

Average Household Size Assumptions. Based on the project description and density, an average household size of 2.91 persons per household was used for the proposed project.

Household Income Assumptions. Income characteristics were based on the incomes for the parent zone.

Employment Assumptions. Employee forecasts and densities were evaluated based on the changes proposed in the Project and based on the current employment density of the parent zone². The change based on the model densities was used to present a conservative analysis.

¹ TAPP, Page 15 states that the TAZ the project is added to (Project TAZ) should be empty, or have existing land uses reallocated to neighboring TAZs, when the project land use is added. However, for land use plans and projects that have multiple parcels within a TAZ as well as in the entire City, it is recommended that the TAZ is modified to code the project socio economic data (SED), instead of relocating the existing land uses to neighboring TAZs. This is also known as the additive method.

² As currently is being proposed, only HIOZ parcels along arterial streets will be required to provide commercial space in mixed-use HIOZ projects. This does not preclude other HIOZ parcels from similarly providing commercial space in addition to residential if they wished to do so. This means that any HIOZ parcel would be capable of developing commercial in addition to residential as part of HIOZ program. In the most conservative scenario, all future HIOZ projects across all HIOZ parcels provide some commercial use in addition to residential. Referencing Table B-9 in the City's Housing Element which studied the 5 most recently completed mixed-use projects in the city, it demonstrates that an average of 12% of ground floor site area is dedicated to commercial uses in a mixed-use project in the city of Fullerton. Therefore, applying this 12% across all 759 HIOZ parcels, approximately 3.1 million square feet of commercial uses could be developed in the HIOZ program. Using the ratio of 623 square feet per employee for retail employees in the Orange County area from Table 6B provided in the SCAG Employment Density Report (2001), this would result in 4,979 employees. However, due to removal of existing non-residential uses, a reduction of 11,139 employees was conservatively estimated (or a reduction of 6,160 employees). Based on the validated model, the employee reduction was estimated at approximately 6,071 employees. The lower reduction was used in the analysis to present a conservative evaluation.

Detailed SED inputs are included in Attachment A.

MODEL NETWORK UPDATES

No changes to roadway or transit were made for the baseline or horizon scenarios.

MODEL RUNS AND OUTPUTS

Model Runs were conducted for the 2016 and 2045 conditions for both without the project and with the project with the above discussed SED and networks. Consistent to standard modeling practice, each model was run with conditions that at least 5-loops³ be run or until a convergence of 0.01 (i.e., 1.0%) is achieved. Detailed model outputs are shown in Attachment B.

³ Models are run with feedback loops wherein the output of one run is becomes the basis of the next run. In this process, the predicted speeds are used to re-compute highway and transit travel times, and the entire model sequence is repeated until input and output speeds are generally consistent with each other. Each iteration is referred to as a loop. The percentage change in total travel cost between one iteration and the next is referred to as "convergence". A convergence of 0.01 means that the change in travel cost between one run and the next is 1%. Models in the SCAG region is generally run for 5 loops or a convergence of 0.01.

APPENDIX A - MODEL SOCIO-ECONOMIC DATA

ZONE	2016 No Project											COUNTY	ACERAGE
	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR			
23	2	2	1	1	53603	356	2052	560	0	0	2	215	
24	28	28	14	13	61736	106	276	2177	0	0	2	165	
33	4436	4423	1934	1472	72924	303	167	245	34	0	2	393	
34	2686	2666	1298	764	61604	192	286	94	0	0	2	214	
65	3443	3419	1732	1140	72298	29	511	282	295	0	2	279	
69	3792	3781	1940	1322	79451	67	272	167	0	0	2	302	
70	1773	1704	597	583	123755	6	132	121	531	0	2	316	
71	1092	1092	604	353	123179	18	163	54	0	0	2	275	
72	1962	1854	819	648	128679	24	539	307	666	0	2	499	
73	1758	1758	892	485	89655	277	216	293	0	0	2	176	
74	1513	1513	766	665	90141	57	188	590	0	0	2	162	
75	1472	1465	673	483	73587	3	147	117	0	0	2	411	
76	3186	3186	1288	1088	83646	16	32	125	0	0	2	598	
77	1267	1044	560	451	106503	34	677	112	868	0	2	269	
78	2194	2194	1019	739	88663	25	78	105	720	0	2	187	
79	2923	2915	1879	1194	58090	36	65	340	0	0	2	193	
80	1654	1654	705	500	57297	4	50	309	0	0	2	158	
81	2563	2443	902	1043	90656	139	4238	863	0	0	2	454	
82	957	957	473	353	144812	0	380	150	1449	0	2	372	
83	3215	3203	1567	1227	104743	13	238	228	0	0	2	588	
84	2389	2389	1233	990	53113	34	138	321	476	0	2	170	
85	645	633	366	255	95815	0	124	121	0	0	2	97	
86	2184	2184	995	686	109752	11	145	143	797	0	2	195	
87	2314	2305	931	734	58763	16	53	134	0	0	2	217	
88	2045	1986	1009	737	39717	9	67	29	0	0	2	71	
89	1590	1445	772	591	82154	21	427	261	0	0	2	317	
90	1056	1056	337	384	56734	25	303	149	998	0	2	154	
91	6272	6272	3436	2175	54944	455	497	319	543	0	2	202	
92	430	430	155	132	77169	0	79	44	0	0	2	123	
93	554	554	288	212	107229	0	11	60	0	0	2	98	
94	4495	4490	2042	1420	74336	3	86	195	0	0	2	245	
95	5046	5039	2356	1467	103461	536	678	2083	3302	0	2	404	
96	3667	2174	1508	984	19801	126	5213	617	0	40653	2	338	
97	2888	2888	1903	1367	47634	258	298	201	0	0	2	146	
98	1869	1869	921	730	102339	90	452	824	0	0	2	233	
99	1805	1665	933	560	84540	0	662	301	3853	1283	2	215	
100	763	595	387	246	42099	8	172	206	2110	0	2	127	
101	764	764	328	312	88364	4	14	53	0	0	2	99	
102	1947	1930	1079	612	80168	3	64	193	642	0	2	181	
103	1291	1291	557	502	86543	0	99	72	760	0	2	140	
104	987	979	438	353	91460	6	102	58	0	0	2	97	
105	543	543	233	183	89010	0	274	55	6	23849	2	124	
106	850	843	441	290	107583	0	481	123	476	0	2	86	
107	734	734	373	253	54759	3	137	73	0	0	2	64	
108	0	0	0	0	0	0	71	1150	0	0	2	114	
109	1006	989	666	517	21194	35	136	1635	0	0	2	241	
110	1737	1737	1043	530	62593	0	25	63	0	0	2	131	
111	2476	2401	845	713	31897	47	335	1153	0	0	2	250	
112	2363	2352	1302	838	61774	72	324	464	0	0	2	194	
113	2953	2722	1332	1132	48958	144	589	1004	0	0	2	276	
114	2845	2520	1413	1372	53402	127	1813	944	0	0	2	207	
115	2563	2504	1310	850	59262	17	255	536	0	0	2	145	
116	2437	2363	934	806	36346	58	293	1034	0	0	2	158	
117	2501	2463	1288	954	44097	42	242	566	1259	0	2	159	
118	1719	1684	949	450	77497	99	167	256	0	0	2	174	
119	7397	7364	3041	2081	39748	74	391	453	650	0	2	292	
120	2881	2872	1510	788	67054	78	232	172	10	0	2	204	
121	3113	2822	1626	786	72860	3	227	332	1042	0	2	212	
122	2137	2137	981	656	46520	43	321	656	0	0	2	184	
123	2	2	1	1	120818	160	792	2783	0	0	2	250	
124	1877	1872	940	397	65002	12	4	60	769	0	2	87	
125	3117	3100	1212	759	41878	87	202	194	0	0	2	86	
126	1178	1178	566	252	54876	364	340	147	387	0	2	87	
128	2431	2426	1159	738	39519	189	197	150	706	0	2	152	
129	2781	2691	1248	754	55699	0	82	117	0	0	2	162	
130	0	0	0	0	0	284	469	2053	0	0	2	139	
131	0	0	0	0	0	39	250	1755	0	0	2	164	
132	1938	1715	755	491	42376	47	113	98	0	0	2	112	
133	1620	1619	770	423	81580	0	83	418	687	0	2	122	
134	2004	1987	1156	551	62582	30	54	68	0	0	2	106	
135	1931	1931	874	447	59291	105	60	53	0	0	2	115	
136	3236	3235	1731	1049	44691	330	214	229	439	0	2	119	
137	368	368	176	148	52590	378	227	44	0	0	2	60	
138	231	231	109	56	46923	117	581	2222	0	0	2	187	
139	1477	1477	692	302	46920	202	228	1372	0	0	2	121	
City	151,363	147,121	72,313	49,540	5,110,453	6,496	30,600	36,055	24,475	65,785	150	15,379	

APPENDIX A - MODEL SOCIO-ECONOMIC DATA

ZONE	2016 Project SED											COUNTY	ACERAGE
	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR			
23	2383	2383	819	819	0	-27	-154	-42	0	0	0	0	0
24	3942	3942	1459	1355	0	-9	-23	-179	0	0	0	0	0
33	69	69	31	24	0	-2	-1	-2	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0
65	228	228	119	78	0	0	-3	-2	0	0	0	0	0
69	997	997	503	343	0	-9	-35	-22	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0
72	2661	2661	1156	914	0	-5	-116	-66	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0
74	807	807	320	277	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0	0
78	155	155	73	53	0	-1	-2	-3	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0
81	2499	2499	743	859	0	-5	-164	-33	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0	0
84	215	215	92	74	0	0	0	-1	0	0	0	0	0
85	494	494	244	170	0	0	-15	-15	0	0	0	0	0
86	203	203	101	70	0	0	-4	-4	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0	0
89	1008	1008	453	346	0	-1	-29	-18	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0
91	5830	5830	3165	2003	0	-138	-151	-97	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0
95	5887	5887	3249	2023	0	-51	-65	-200	0	0	0	0	0
96	3040	3040	1601	1045	0	-5	-192	-23	0	0	0	0	0
97	3877	3877	1855	1332	0	-81	-93	-63	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0
99	1114	1114	638	383	0	0	-30	-14	0	0	0	0	0
100	473	473	256	163	0	-1	-14	-17	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0
104	116	116	49	40	0	0	-1	0	0	0	0	0	0
105	273	273	119	94	0	0	-13	-3	0	0	0	0	0
106	573	573	300	197	0	0	-76	-19	0	0	0	0	0
107	1020	1020	517	350	0	-1	-49	-26	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0
109	4745	4745	2101	1631	0	-2	-9	-105	0	0	0	0	0
110	140	140	95	48	0	0	-3	-7	0	0	0	0	0
111	2205	2205	898	758	0	-3	-21	-71	0	0	0	0	0
112	3357	3357	1792	1154	0	-14	-61	-88	0	0	0	0	0
113	9879	9879	3995	3395	0	-40	-163	-278	0	0	0	0	0
114	3188	3188	1128	1096	0	-10	-145	-75	0	0	0	0	0
115	5645	5645	2990	1940	0	-6	-86	-181	0	0	0	0	0
116	6848	6848	2727	2353	0	-14	-71	-252	0	0	0	0	0
117	6286	6286	2917	2160	0	-22	-124	-290	0	0	0	0	0
118	4136	4136	2997	1421	0	-70	-117	-180	0	0	0	0	0
119	1667	1667	837	573	0	-7	-39	-45	0	0	0	0	0
120	183	183	121	63	0	-2	-5	-4	0	0	0	0	0
121	2890	2890	2055	993	0	-1	-53	-77	0	0	0	0	0
122	131	131	67	45	0	0	-3	-6	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0
124	298	298	242	102	0	-2	-1	-10	0	0	0	0	0
125	1852	1852	1016	636	0	-19	-44	-43	0	0	0	0	0
126	278	278	214	95	0	-9	-8	-4	0	0	0	0	0
128	1269	1269	685	436	0	-45	-47	-36	0	0	0	0	0
129	939	939	534	323	0	0	-16	-23	0	0	0	0	0
130	5329	5329	2673	1831	0	-27	-44	-192	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0
132	645	645	341	222	0	-5	-12	-10	0	0	0	0	0
133	151	151	95	52	0	0	0	0	0	0	0	0	0
134	637	637	459	219	0	-6	-10	-13	0	0	0	0	0
135	1539	1539	1034	529	0	-56	-32	-29	0	0	0	0	0
136	184	184	104	63	0	-6	-4	-4	0	0	0	0	0
137	1345	1345	550	462	0	-87	-52	-10	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0
City	103,629	103,629	50,525	35,611	-	(788)	(2,402)	(2,880)	-	-	-	-	0

APPENDIX A - MODEL SOCIO-ECONOMIC DATA

ZONE	2016 With Project SED											COUNTY	ACERAGE
	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR			
23	2385	2385	820	820	53603	329	1898	518	0	0	0	2	215
24	3970	3970	1473	1368	61736	97	253	1998	0	0	0	2	165
33	4505	4492	1965	1496	72924	301	166	243	34	0	0	2	393
34	2686	2666	1298	764	61604	192	286	94	0	0	0	2	214
65	3671	3647	1851	1218	72298	29	508	280	295	0	0	2	279
69	4789	4778	2443	1665	79451	58	237	145	0	0	0	2	302
70	1773	1704	597	583	123755	6	132	121	531	0	0	2	316
71	1092	1092	604	353	123179	18	163	54	0	0	0	2	275
72	4623	4515	1975	1562	128679	19	423	241	666	0	0	2	499
73	1758	1758	892	485	89655	277	216	293	0	0	0	2	176
74	2320	2320	1086	942	90141	57	188	590	0	0	0	2	162
75	1472	1465	673	483	73587	3	147	117	0	0	0	2	411
76	3186	3186	1288	1088	83646	16	32	125	0	0	0	2	598
77	1267	1044	560	451	106503	34	677	112	868	0	0	2	269
78	2349	2349	1092	792	88663	24	76	102	720	0	0	2	187
79	2923	2915	1879	1194	58090	36	65	340	0	0	0	2	193
80	1654	1654	705	500	57297	4	50	309	0	0	0	2	158
81	5062	4942	1645	1902	90656	134	4074	830	0	0	0	2	454
82	957	957	473	353	144812	0	380	150	1449	0	0	2	372
83	3215	3203	1567	1227	104743	13	238	228	0	0	0	2	588
84	2604	2604	1325	1064	53113	34	138	320	476	0	0	2	170
85	1139	1127	610	425	95815	0	109	106	0	0	0	2	97
86	2387	2387	1096	756	109752	11	141	139	797	0	0	2	195
87	2314	2305	931	734	58763	16	53	134	0	0	0	2	217
88	2045	1986	1009	737	39717	9	67	29	0	0	0	2	71
89	2598	2453	1225	937	82154	20	398	243	0	0	0	2	317
90	1056	1056	337	384	56734	25	303	149	998	0	0	2	154
91	12102	12102	6601	4178	54944	317	346	222	543	0	0	2	202
92	430	430	155	132	77169	0	79	44	0	0	0	2	123
93	554	554	288	212	107229	0	11	60	0	0	0	2	98
94	4495	4490	2042	1420	74336	3	86	195	0	0	0	2	245
95	10933	10926	5605	3490	103461	485	613	1883	3302	0	0	2	404
96	6707	5214	3109	2029	19801	121	5021	594	0	40653	0	2	338
97	6765	6765	3758	2699	47634	177	205	138	0	0	0	2	146
98	1869	1869	921	730	102339	90	452	824	0	0	0	2	233
99	2919	2779	1571	943	84540	0	632	287	3853	1283	0	2	215
100	1236	1068	643	409	42099	7	158	189	2110	0	0	2	127
101	764	764	328	312	88364	4	14	53	0	0	0	2	99
102	1947	1930	1079	612	80168	3	64	193	642	0	0	2	181
103	1291	1291	557	502	86543	0	99	72	760	0	0	2	140
104	1103	1095	487	393	91460	6	101	58	0	0	0	2	97
105	816	816	352	277	89010	0	261	52	6	23849	0	2	124
106	1423	1416	741	487	107583	0	405	104	476	0	0	2	86
107	1754	1754	890	603	54759	2	88	47	0	0	0	2	64
108	0	0	0	0	0	0	71	1150	0	0	0	2	114
109	5751	5734	2767	2148	21194	33	127	1530	0	0	0	2	241
110	1877	1877	1138	578	62593	0	22	56	0	0	0	2	131
111	4681	4606	1743	1471	31897	44	314	1082	0	0	0	2	250
112	5720	5709	3094	1992	61774	58	263	376	0	0	0	2	194
113	12832	12601	5327	4527	48958	104	426	726	0	0	0	2	276
114	6033	5708	2541	2468	53402	117	1668	869	0	0	0	2	207
115	8208	8149	4300	2790	59262	11	169	355	0	0	0	2	145
116	9285	9211	3661	3159	36346	44	222	782	0	0	0	2	158
117	8787	8749	4205	3114	44097	20	118	276	1259	0	0	2	159
118	5855	5820	3946	1871	77497	29	50	76	0	0	0	2	174
119	9064	9031	3878	2654	39748	67	352	408	650	0	0	2	292
120	3064	3055	1631	851	67054	76	227	168	10	0	0	2	204
121	6003	5712	3681	1779	72860	2	174	255	1042	0	0	2	212
122	2268	2268	1048	701	46520	43	318	650	0	0	0	2	184
123	2	2	1	1	120818	160	792	2783	0	0	0	2	250
124	2175	2170	1182	499	65002	10	3	50	769	0	0	2	87
125	4969	4952	2228	1395	41878	68	158	151	0	0	0	2	86
126	1456	1456	780	347	54876	355	332	143	387	0	0	2	87
128	3700	3695	1844	1174	39519	144	150	114	706	0	0	2	152
129	3720	3630	1782	1077	55699	0	66	94	0	0	0	2	162
130	5329	5329	2673	1831	0	257	425	1861	0	0	0	2	139
131	0	0	0	0	0	39	250	1755	0	0	0	2	164
132	2583	2360	1096	713	42376	42	101	88	0	0	0	2	112
133	1771	1770	865	475	81580	0	83	418	687	0	0	2	122
134	2641	2624	1615	770	62582	24	44	55	0	0	0	2	106
135	3470	3470	1908	976	59291	49	28	24	0	0	0	2	115
136	3420	3419	1835	1112	44691	324	210	225	439	0	0	2	119
137	1713	1713	726	610	52590	291	175	34	0	0	0	2	60
138	231	231	109	56	46923	117	581	2222	0	0	0	2	187
139	1477	1477	692	302	46920	202	228	1372	0	0	0	2	121
City	254,992	250,750	122,838	85,151	5,110,453	5,708	28,198	33,175	24,475	65,785	150	15,379	

APPENDIX A - MODEL SOCIO-ECONOMIC DATA

ZONE	2045 No Project										COUNTY	ACERAGE
	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR		
23	2	2	1	1	53603	620	2695	2705	0	0	2	215
24	28	28	14	13	61736	238	666	2690	0	0	2	165
33	4505	4492	1991	1486	72924	310	188	250	34	0	2	393
34	2730	2710	1335	772	61604	221	286	94	0	0	2	214
65	3599	3575	1840	1186	72298	31	521	302	292	0	2	279
69	3910	3899	2026	1358	79451	71	295	176	0	0	2	302
70	1804	1735	614	588	123755	6	157	121	503	0	2	316
71	1107	1107	619	355	123179	23	164	55	0	0	2	275
72	2312	2092	982	755	128152	44	733	544	630	0	2	499
73	1783	1783	915	485	89655	285	259	301	0	0	2	176
74	1534	1534	787	671	90141	61	217	610	0	0	2	162
75	1492	1485	690	483	73587	7	158	118	0	0	2	411
76	3229	3229	1324	1095	83646	78	88	133	0	0	2	598
77	1286	1058	576	454	106503	28	732	164	818	0	2	269
78	2231	2231	1049	747	88663	25	95	106	684	0	2	187
79	2969	2961	1933	1206	58090	36	75	340	0	0	2	193
80	1677	1677	725	500	57297	11	53	309	0	0	2	158
81	2646	2521	945	1082	90656	211	5142	1231	0	0	2	454
82	975	975	489	356	144812	0	432	151	1413	0	2	372
83	3266	3254	1611	1237	104743	13	277	229	0	0	2	588
84	2423	2423	1269	998	53113	51	154	324	448	0	2	170
85	657	645	376	257	95815	0	141	121	0	0	2	97
86	2221	2221	1025	692	109752	11	162	144	754	0	2	195
87	2352	2343	957	741	58763	16	53	139	0	0	2	217
88	2370	2311	1189	901	39717	21	89	30	0	0	2	71
89	1719	1569	849	674	81829	41	642	501	0	0	2	317
90	1075	1075	348	387	56734	32	316	150	939	0	2	154
91	6379	6379	3559	2219	54944	575	597	426	515	0	2	202
92	442	442	160	134	77169	0	91	44	0	0	2	123
93	567	567	297	215	107229	0	11	66	0	0	2	98
94	4557	4552	2095	1431	74336	3	115	195	0	0	2	245
95	5164	5157	2441	1495	103461	551	766	2084	3103	0	2	404
96	4072	2541	1696	1093	19801	168	6627	1072	0	43740	2	338
97	3408	3408	2288	1638	47634	337	354	264	0	0	2	146
98	2254	2254	1129	951	101648	288	984	1450	0	0	2	233
99	1962	1817	1030	612	84107	18	744	336	3672	1283	2	215
100	1045	872	541	345	41435	0	264	289	1986	0	2	127
101	781	781	340	315	88364	4	15	53	0	0	2	99
102	1977	1960	1108	616	80168	3	77	193	612	0	2	181
103	1312	1312	574	504	86543	0	112	72	718	0	2	140
104	1000	992	450	354	91460	13	102	58	0	0	2	97
105	551	551	241	184	89010	0	405	116	6	27700	2	124
106	864	857	454	292	107583	0	543	130	450	0	2	86
107	748	748	384	256	54759	30	171	91	0	0	2	64
108	0	0	0	0	0	20	71	1141	0	0	2	114
109	1245	1228	835	642	21194	0	387	2143	0	0	2	241
110	1761	1761	1071	531	62593	0	54	63	0	0	2	131
111	2813	2738	973	821	31897	69	412	1295	0	0	2	250
112	2756	2745	1541	982	61325	79	362	541	0	0	2	194
113	3396	3160	1561	1420	48574	153	651	1147	0	0	2	276
114	5008	4672	2538	2830	53402	265	2067	1246	0	0	2	207
115	2600	2541	1349	859	59262	49	357	735	0	0	2	145
116	2825	2751	1097	911	36346	180	430	1233	0	0	2	158
117	2742	2704	1434	1054	44097	42	388	780	1181	0	2	159
118	1881	1846	1054	509	77035	179	294	427	0	0	2	174
119	7498	7465	3118	2100	39748	180	447	466	608	0	2	292
120	3085	3076	1643	885	66696	142	301	265	9	0	2	204
121	3364	3067	1785	887	72472	67	329	386	999	0	2	212
122	3207	3207	1508	1002	46024	70	348	683	0	0	2	184
123	122	122	44	51	116467	184	1107	3487	0	0	2	250
124	2440	2435	1237	498	64095	17	5	60	722	0	2	87
125	4821	4804	1932	1324	41878	138	242	233	0	0	2	86
126	1987	1987	981	599	54418	601	569	369	363	0	2	87
128	2600	2595	1257	790	39519	234	239	165	657	0	2	152
129	2959	2869	1349	785	55699	42	128	132	0	0	2	162
130	87	87	44	37	49566	333	741	2553	0	0	2	139
131	99	99	36	41	48919	59	461	2263	0	0	2	164
132	2100	1872	831	533	42376	109	153	149	0	0	2	112
133	1727	1726	831	463	81209	61	127	438	642	0	2	122
134	2281	2264	1339	653	62198	66	77	90	0	0	2	106
135	3050	3050	1410	594	57543	134	83	77	0	0	2	115
136	3518	3517	1921	1164	44691	547	464	460	411	0	2	119
137	1276	1276	623	657	52590	641	502	285	0	0	2	60
138	307	307	133	91	46373	132	772	2745	0	0	2	187
139	1530	1530	725	320	46920	223	354	1633	0	0	2	121
City	168,070	163,626	81,466	56,167	5,194,992	9,497	39,690	46,667	23,169	72,723	150	15,379

APPENDIX A - MODEL SOCIO-ECONOMIC DATA

ZONE	2045 Project SED											
	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE
23	2383	2383	819	819	0	-27	-154	-42	0	0	0	0
24	3942	3942	1459	1355	0	-9	-23	-179	0	0	0	0
33	69	69	31	24	0	-2	-1	-2	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0
65	228	228	119	78	0	0	-3	-2	0	0	0	0
69	997	997	503	343	0	-9	-35	-22	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0
72	2661	2661	1156	914	0	-5	-116	-66	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0
74	807	807	320	277	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0
78	155	155	73	53	0	-1	-2	-3	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0
81	2499	2499	743	859	0	-5	-164	-33	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0
84	215	215	92	74	0	0	0	-1	0	0	0	0
85	494	494	244	170	0	0	-15	-15	0	0	0	0
86	203	203	101	70	0	0	-4	-4	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0
89	1008	1008	453	346	0	-1	-29	-18	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
91	5830	5830	3165	2003	0	-138	-151	-97	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0
95	5887	5887	3249	2023	0	-51	-65	-200	0	0	0	0
96	3040	3040	1601	1045	0	-5	-192	-23	0	0	0	0
97	3877	3877	1855	1332	0	-81	-93	-63	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0
99	1114	1114	638	383	0	0	-30	-14	0	0	0	0
100	473	473	256	163	0	-1	-14	-17	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0
104	116	116	49	40	0	0	-1	0	0	0	0	0
105	273	273	119	94	0	0	-13	-3	0	0	0	0
106	573	573	300	197	0	0	-76	-19	0	0	0	0
107	1020	1020	517	350	0	-1	-49	-26	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0
109	4745	4745	2101	1631	0	-2	-9	-105	0	0	0	0
110	140	140	95	48	0	0	-3	-7	0	0	0	0
111	2205	2205	898	758	0	-3	-21	-71	0	0	0	0
112	3357	3357	1792	1154	0	-14	-61	-88	0	0	0	0
113	9879	9879	3995	3395	0	-40	-163	-278	0	0	0	0
114	3188	3188	1128	1096	0	-10	-145	-75	0	0	0	0
115	5645	5645	2990	1940	0	-6	-86	-181	0	0	0	0
116	6848	6848	2727	2353	0	-14	-71	-252	0	0	0	0
117	6286	6286	2917	2160	0	-22	-124	-290	0	0	0	0
118	4136	4136	2997	1421	0	-70	-117	-180	0	0	0	0
119	1667	1667	837	573	0	-7	-39	-45	0	0	0	0
120	183	183	121	63	0	-2	-5	-4	0	0	0	0
121	2890	2890	2055	993	0	-1	-53	-77	0	0	0	0
122	131	131	67	45	0	0	-3	-6	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0
124	298	298	242	102	0	-2	-1	-10	0	0	0	0
125	1852	1852	1016	636	0	-19	-44	-43	0	0	0	0
126	278	278	214	95	0	-9	-8	-4	0	0	0	0
128	1269	1269	685	436	0	-45	-47	-36	0	0	0	0
129	939	939	534	323	0	0	-16	-23	0	0	0	0
130	5329	5329	2673	1831	0	-27	-44	-192	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0
132	645	645	341	222	0	-5	-12	-10	0	0	0	0
133	151	151	95	52	0	0	0	0	0	0	0	0
134	637	637	459	219	0	-6	-10	-13	0	0	0	0
135	1539	1539	1034	529	0	-56	-32	-29	0	0	0	0
136	184	184	104	63	0	-6	-4	-4	0	0	0	0
137	1345	1345	550	462	0	-87	-52	-10	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0
City	103,629	103,629	50,525	35,611	-	(788)	(2,402)	(2,880)	-	-	-	-

APPENDIX A - MODEL SOCIO-ECONOMIC DATA

2045 With Project SED													
ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	
23	2385	2385	820	820	53603	593	2541	2663	0	0	2	215	
24	3970	3970	1473	1368	61736	229	643	2511	0	0	2	165	
33	4574	4561	2022	1510	72924	308	187	248	34	0	2	393	
34	2730	2710	1335	772	61604	221	286	94	0	0	2	214	
65	3827	3803	1959	1264	72298	31	518	300	292	0	2	279	
69	4907	4896	2529	1701	79451	62	260	154	0	0	2	302	
70	1804	1735	614	588	123755	6	157	121	503	0	2	316	
71	1107	1107	619	355	123179	23	164	55	0	0	2	275	
72	4973	4753	2138	1669	128152	39	617	478	630	0	2	499	
73	1783	1783	915	485	89655	285	259	301	0	0	2	176	
74	2341	2341	1107	948	90141	61	217	610	0	0	2	162	
75	1492	1485	690	483	73587	7	158	118	0	0	2	411	
76	3229	3229	1324	1095	83646	78	88	133	0	0	2	598	
77	1286	1058	576	454	106503	28	732	164	818	0	2	269	
78	2386	2386	1122	800	88663	24	93	103	684	0	2	187	
79	2969	2961	1933	1206	58090	36	75	340	0	0	2	193	
80	1677	1677	725	500	57297	11	53	309	0	0	2	158	
81	5145	5020	1688	1941	90656	206	4978	1198	0	0	2	454	
82	975	975	489	356	144812	0	432	151	1413	0	2	372	
83	3266	3254	1611	1237	104743	13	277	229	0	0	2	588	
84	2638	2638	1361	1072	53113	51	154	323	448	0	2	170	
85	1151	1139	620	427	95815	0	126	106	0	0	2	97	
86	2424	2424	1126	762	109752	11	158	140	754	0	2	195	
87	2352	2343	957	741	58763	16	53	139	0	0	2	217	
88	2370	2311	1189	901	39717	21	89	30	0	0	2	71	
89	2727	2577	1302	1020	81829	40	613	483	0	0	2	317	
90	1075	1075	348	387	56734	32	316	150	939	0	2	154	
91	12209	12209	6724	4222	54944	437	446	329	515	0	2	202	
92	442	442	160	134	77169	0	91	44	0	0	2	123	
93	567	567	297	215	107229	0	11	66	0	0	2	98	
94	4557	4552	2095	1431	74336	3	115	195	0	0	2	245	
95	11051	11044	5690	3518	103461	500	701	1884	3103	0	2	404	
96	7112	5581	3297	2138	19801	163	6435	1049	0	43740	2	338	
97	7285	7285	4143	2970	47634	256	261	201	0	0	2	146	
98	2254	2254	1129	951	101648	288	984	1450	0	0	2	233	
99	3076	2931	1668	995	84107	18	714	322	3672	1283	2	215	
100	1518	1345	797	508	41435	0	250	272	1986	0	2	127	
101	781	781	340	315	88364	4	15	53	0	0	2	99	
102	1977	1960	1108	616	80168	3	77	193	612	0	2	181	
103	1312	1312	574	504	86543	0	112	72	718	0	2	140	
104	1116	1108	499	394	91460	13	101	58	0	0	2	97	
105	824	824	360	278	89010	0	392	113	6	27700	2	124	
106	1437	1430	754	489	107583	0	467	111	450	0	2	86	
107	1768	1768	901	606	54759	29	122	65	0	0	2	64	
108	0	0	0	0	0	20	71	1141	0	0	2	114	
109	5990	5973	2936	2273	21194	0	378	2038	0	0	2	241	
110	1901	1901	1166	579	62593	0	51	56	0	0	2	131	
111	5018	4943	1871	1579	31897	66	391	1224	0	0	2	250	
112	6113	6102	3333	2136	61325	65	301	453	0	0	2	194	
113	13275	13039	5556	4815	48574	113	488	869	0	0	2	276	
114	8196	7860	3666	3926	53402	255	1922	1171	0	0	2	207	
115	8245	8186	4339	2799	59262	43	271	554	0	0	2	145	
116	9673	9599	3824	3264	36346	166	359	981	0	0	2	158	
117	9028	8990	4351	3214	44097	20	264	490	1181	0	2	159	
118	6017	5982	4051	1930	77035	109	177	247	0	0	2	174	
119	9165	9132	3955	2673	39748	173	408	421	608	0	2	292	
120	3268	3259	1764	948	66696	140	296	261	9	0	2	204	
121	6254	5957	3840	1880	72472	66	276	309	999	0	2	212	
122	3338	3338	1575	1047	46024	70	345	677	0	0	2	184	
123	122	122	44	51	116467	184	1107	3487	0	0	2	250	
124	2738	2733	1479	600	64095	15	4	50	722	0	2	87	
125	6673	6656	2948	1960	41878	119	198	190	0	0	2	86	
126	2265	2265	1195	694	54418	592	561	365	363	0	2	87	
128	3869	3864	1942	1226	39519	189	192	129	657	0	2	152	
129	3898	3808	1883	1108	55699	42	112	109	0	0	2	162	
130	5416	5416	2717	1868	49566	306	697	2361	0	0	2	139	
131	99	99	36	41	48919	59	461	2263	0	0	2	164	
132	2745	2517	1172	755	42376	104	141	139	0	0	2	112	
133	1878	1877	926	515	81209	61	127	438	642	0	2	122	
134	2918	2901	1798	872	62198	60	67	77	0	0	2	106	
135	4589	4589	2444	1123	57543	78	51	48	0	0	2	115	
136	3702	3701	2025	1227	44691	541	460	456	411	0	2	119	
137	2621	2621	1173	1119	52590	554	450	275	0	0	2	60	
138	307	307	133	91	46373	132	772	2745	0	0	2	187	
139	1530	1530	725	320	46920	223	354	1633	0	0	2	121	
City	271,699	267,255	131,991	91,778	5,194,992	8,712	37,288	43,787	23,169	72,723	150	15,379	

**APPENDIX B - OCTAM OUTPUT SUMMARY
BASE YEAR 2016 RESULTS**

City of Fullerton	2016 No Project	2016 With Project	Net New Project
Population	151,363	254,993	103,630
Employment	73,151	67,080	(6,071)
Service Population	224,514	322,073	97,559
Total Origin-Destination (OD) VMT	6,932,550	8,594,871	1,662,320
OD VMT per service population	30.9	26.7	17.0

Roadway VMT / Project's effect on VMT (City of Fullerton)

2016	With Project	Without Project
Roadway VMT	2,761,767	2,490,121
Service Population	322,073	224,514
VMT per service population	8.6	11.1

Roadway VMT / Project's effect on VMT (Orange County)

2016	With Project	Without Project
Roadway VMT	71,986,838	70,404,086
Service Population	4,987,332	4,889,773
VMT per service population	14.4	14.4

**APPENDIX B - OCTAM OUTPUT SUMMARY
BASE YEAR 2045 RESULTS**

City of Fullerton	2045 No Project	2045 With Project	Net New Project
Population	168,070	271,700	103,630
Employment	95,854	89,783	(6,071)
Service Population	263,924	361,483	97,559
Total Origin-Destination (OD) VMT	8,092,878	9,559,086	1,466,209
OD VMT per service population	30.7	26.4	15.0

Roadway VMT / Project's effect on VMT (City of Fullerton)

2040	With Project	Without Project
Roadway VMT	3,065,365	2,819,474
Service Population	361,483	263,924
VMT per service population	8.5	10.7

Roadway VMT / Project's effect on VMT (Orange County)

2045	With Project	Without Project
Roadway VMT	80,904,987	79,430,075
Service Population	5,612,612	5,515,053
VMT per service population	14.4	14.4